BALLISTIC, CRUISE MISSILE, AND MISSILE DEFENSE SYSTEMS: TRADE AND SIGNIFICANT DEVELOPMENTS, FEBRUARY 1994-MAY 1994

AFGHANISTAN

INTERNAL DEVELOPMENTS

4/28/94

Opposition forces launch 113 rockets and mortar bombs at Kabul, killing 21 people.

Washington Times, 4/30/94, p. A8 **(3989)**.

*The numbers listed in parenthesis following the bibliographic references refer to the identification number of the document in the International Missile Proliferation Project Database, from which the news summaries are abstracted. Because of the rapidly changing nature of the subject matter, **The Nonproliferation Review** is unable to guarantee that the information reported herein is complete or accurate, and disclaims liability to any party for any loss or damage caused by errors or omissions.*

AUSTRALIA

AUSTRALIA WITH PRC

2/18/94

The vice president of the China Aerospace Corporation Wang Liheng states that his company is close to finalizing an agreement with Optus Communications of Australia to launch the Optus-3 satellite on a Chinese Long March 3A rocket. China hopes to compete with the U.S. and Europe in the commercial space launch market by offering less expensive launches using its Long March rockets, a modified version of a Chinese ICBM.

Reuter, 2/18/94; in Executive News Service, 2/21/94 **(4188)**. Reuter, 2/22/94 **(4115)**.

BOSNIA-HERZEGOVINA

INTERNAL DEVELOPMENTS

5/94

After the war in Yugoslavia began, Serbs and Croats captured many of the defense facilities in Bosnia-Herzegovina. The Serbs captured the 'Rudi Cajevac' electronics plant and the 'Kosmos' aerospace repair plant in Banja Luka, both of which produced many types of guided missiles. Bosnian Muslims reportedly have defense research institutes located in Sarajevo and Zenica, which teach courses organized by the Department for Military Engineering at the Sarajevo Faculty for Mechanical Engineering on missiles, artillery and engines. It is believed that Bosnian Serbs are again producing MRLs and other weapons at the 'Bratstvo' (Brotherhood) plant, located in Novi Travnik. The Bratstvo plant is capable of building the 282 mm Orkan (KOL 15) and the 128 mm Oganj MRLs. The 'Azotora' plant in Vitkovici makes ammonium perchlorate and the 'Vitezit' plant, located at Kruscica Mountain, makes the Plamen and Orkan MRLs, 57 mm air-to-surface rockets, and the Soviet designed Malyutka antitank guided missile.

Milan Vego, *Jane's Intelligence Review*, 5/94, pp. 213-214 **(4005)**.

BOSNIA-HERZEGOVINA WITH CROATIA

4/94

The deputy army commander of the Republic of Serbian Krajina's (RSK) forces, Lt. Colonel Marinko Gajic, threatens to attack Zagreb with rockets if Croatian forces mount a spring offensive. Gajic states that RSK forces have "enough long-range rockets" to conduct an attack on Zagreb. It is believed

that RSK forces have "several batteries" of FROG-7 rockets.

Paul Beaver, *Jane's Defence Weekly*, 4/9/94, p. 16 **(4280)**.

BOSNIA-HERZEGOVINA WITH SERBIA

3/11/94

Twelve people are killed and another 32 wounded when what are believed to be Russian-made Luna missiles [FROG rockets] launched by Serbian forces destroy eight apartment buildings in Mglaj, Bosnia-Herzegovina.

Srecko Latal, *Washington Times*, 3/12/94, p. A9 **(4275)**.

BOSNIA-HERZEGOVINA WITH MULTI-COUNTRY GROUP

2/9/94

NATO leaders threaten to launch air strikes by 2/21/94 unless the Bosnian Serbs withdraw their "heavy weapons," to include multiple rocket launchers and missiles, or place them under U.N. control.

Natela Cutter, UPI, 2/13/94; in Executive News Service, 2/15/94 **(4281)**.

2/13/94

Bosnian Serb General Manojlo Milovanovic states that he will stop the withdrawal of "heavy weapons" surrounding Sarajevo.

Natela Cutter, UPI, 2/13/94 **(4281)**.

BRAZIL

INTERNAL DEVELOPMENTS

2/94

Brazil merges its rocket and satellite research into the Brazilian Space Agency (AEB), which is under the office of the civilian president. The move is partially to draw attention away from the military and also to give Brazil access to "much-needed" outside technology. Brazilian Science and Technology Minister Jose Israel Vargas says that the space agency will attempt to gain access to sensitive space technologies denied to Brazil by developed countries.

Space News, 2/21/94, p. 2 **(4157)**. Angus Foster, *Financial Times*, 4/25/94 **(4136)**.

2/11/94

The government of Brazil announces that it is willing to comply with the guidelines of the MTCR, but, in an official document, stresses that the implementation of these guidelines does not "imply any sort of limitation on special national programs or harm international cooperation in such programs." Brazil's announcement is an attempt to show that its aerospace programs are peaceful and, by joining the MTCR, Brazil hopes to gain access to "sensitive technology."

Raquel Stenzel, *Gazeta Mercantil* (Sao Paulo), 2/12/94, p. 3; in JPRS-TND-94-006, 3/16/94, P. 16 **(4137)**. Ian Simpson, Reuter, 2/11/94 **(4072)**.

3/94

Lieutenant Brigadier Hugo de Oliveira Piva, known as "Brazil's Dr. Von Braun" and the father of the Brazilian space program, is serving as informal advisor on Brazil's MAA-1 Piranha AAM and MSS 1.2 SSM projects. The projects have been reactivated over the last few months along with four other domestic missile projects that he began before his retirement in 1987. The Piranha missile is being developed by the Mectron Engineering Company, which is based in Sao Jose dos Campos. In 1992, Mectron won a contract from the Brazilian Army to complete the MSS 1.2 SSM, which is now in its testing stage.

Jayme Brener with Helio Contreiras and Otto Sarkis, *Istoe* (Sao Paulo), 2/16/94, pp. 58-59; in JPRS-TND-94-006, 3/16/94, pp. 17-18 **(4071)**.

4/94

Luiz Inacio Lula de Silva, of the opposition Workers' party, visits the Alcantara satellite launch site and says that he will "support the base because of its technological importance." As de Silva's party is the front-runner for the 10/94 presidential elections, de Silva may have been communicating to Brazil's military that important and "favorite" projects will be secure should the Workers' Party come to power.

Angus Foster, *Financial Times*, 4/25/94 **(4136)**.

4/94

The Brazilian Army is ordering a battery of Astros II multiple rocket launchers from the Brazilian company Avibras. The contract is valued at around $40 million, and will provide six launchers, three ammunition vehicles and one fire control post.

Jane's Defence Weekly, 4/5/94, p. 11 **(4252)**.

5/18/94

Embraer spokesman Mario Vinagre announces that the sale of stock in Empresa Brasileira de Aeronautica SA (Embraer), a missile manufacturer, has been postponed from 5/20/94 to 8/4/94 so that all necessary agreements with its creditors can be completed. The sale was to be held at the Sao Paulo Stock Exchange and was valued at $295 million with the future owners having to contend with a $200 million debt and the need to infuse the company with $30 million in cash to recapitalize it.

Jane's Defense Weekly, 5/7/94, p. 3 **(4047)**. *Defense News*, 5/23/94, p. 48 **(4046)**.

BRAZIL WITH JAPAN

3/94

Japanese Space Agency officials visit the Alcantara satellite launch site in Brazil; Russian officials and a private U.S. concern also express interest.

Angus Foster, *Financial Times*, 4/25/94 **(4136)**.

BRAZIL WITH RUSSIA

5/94

Russia is to provide technical support and components for the final development of the Veiculo Lancador de Satelites (VLS), Brazil's four-stage, solid-fuel SLV. The first launch of the VLS is to be in late 1995 from Brazil's Alcantara site.

Flight International, 5/4/94, p. 20 **(4080)**.

CHILE

CHILE WITH UNITED KINGDOM

4/94

According to officials "close to the program," an agreement is near ratification between the Royal Ordnance (RO) of the U.K. and FAMAE of Chile for the development of the Rayo multiple rocket launcher system. The agreement covers the development of the Rayo system from the first phase through production, and will also include future sales. According to Malcolm Lassan, director of sales for the Rocket Systems and Motors division of RO, "The new manufacturing facility (near Santiago) is complete and field trials have been done with motors from that plant." The rocket has been redesigned to improve its dispersal accuracy and has been modified with a three-fin design; the fuzing has also been decided. The Rayo will be mounted on a 6x6 Mercedes-Benz OM442A vehicle, but is modular so that it can be mounted on various types of vehicles. The Chilean army is expected to purchase a few of the systems, but the Rayo will be marketed primarily to international customers.

Jane's Defence Weekly, 4/2/94, p. 11 **(4255)**.

CROATIA

CROATIA WITH BOSNIA-HERZEGOVINA

4/94

The deputy army commander of the Republic of Serbian Krajina's (RSK) forces, Lt. Colonel Marinko Gajic, threatens to attack Zagreb with rockets if Croatian forces mount a spring offensive. Gajic states that RSK forces have "enough long-range rockets" to conduct an attack on Zagreb. It is believed that RSK forces have "several batteries" of FROG-7 rockets.

Paul Beaver, *Jane's Defence Weekly*, 4/9/94, p. 16 **(4280)**.

EGYPT

EGYPT WITH RUSSIA

5/94

In an effort to modernize Egypt's armed forces without purchasing new equipment, the Egyptian military leadership has decided to upgrade its arsenal of Soviet-made SA-2, SA-3, and SA-6 air defense missiles that were acquired prior to the 1973 Arab-Israeli war.

Philip Finnegan, *Defense News*, 5/9/94, pp. 8, 16 **(4019)**.

EGYPT WITH UNITED STATES

3/94

The Egyptian government submits a confidential white paper to the U.S., which describes spare parts, maintenance, and training as Egypt's top three procurement priorities. In addition to emphasizing the acquisition of upgrades and spare parts, the white paper listed weapons that Egypt is requesting from U.S. surplus equipment stocks, including 12 Hawk Phase-3 air defense batteries and 18 other weapon systems.

Philip Finnegan, *Defense News*, 5/9/94, pp. 8, 16 **(4019)**.

4/11/94

The Clinton Administration notifies Congress of the sale of 32 AGM-84 Harpoon anti-ship missiles to Egypt, for use on two leased Knox-class frigates, as part of a $97 million naval package.

House Foreign Affairs Committee; in *Arms Sales Monitor*, 4/30/94, p. 9 **(3994)**.

ESTONIA

ESTONIA WITH UKRAINE

4/21/94

The Estonian Minister of Defense meets with the Ukrainian Minister of Machine Building and Defense Conversion, Dmytro Chernenko, to discuss Estonia's interest in importing from Ukraine anti-aircraft weapons, guidance systems, and other weapons.

Ukrainian Weekly, 5/1/94, p. 2; in Respublika **(4095)**.

FRANCE

INTERNAL DEVELOPMENTS

2/94

A French defense white paper proposes the shifting of resources from nuclear weapons to conventional weapons. While the white paper states that SLBMs should be maintained, it defers important decisions regarding the resumption of nuclear tests and the choice of the second nuclear delivery option. Top military officials are debating whether to develop a long-range nuclear stand-off missile or a mobile or silo-based missile to replace the 18 silo-launched S-3 ballistic missiles, which will be out of service by 2003. The French Defense Council plans to delay deployment of the long-range M5 nuclear missile program from 2005 to 2010, and prolong France's land-based nuclear deterrent by commissioning a study on possible deployment early in the next century of the 6,000 km-range M45 missile. France's nuclear deterrent force has been based on five nuclear-powered submarines that each carry 16 missiles with 6 independently-targeted 180 kt warheads. Also in service were 18 surface-to-surface S3

missiles with one megaton warheads and a range of approximately 3,500 km, as well as 15 Mirage IV bombers capable of carrying 300 kt medium-range missiles over 300 km. Weapons of last resort include 45 300-km range missiles arming the Mirage 2000N and Super Etendard bombers, and 30 surface-to-surface Hades missiles.

Wendy Lambourne, *Pacific Research*, 5/94, p. 33 **(4148)**.

2/23/94

The French government releases its defense White Paper, which, according to Defense Minister Francois Leotard, "was voluntarily written to leave major choices" concerning nuclear testing and missiles until the upcoming presidential elections in 5/95. The White Paper confirms that ballistic missile-launching submarines would be the core of the French nuclear defense force, although it does not indicate whether land-based or air-launched nuclear weapons would be used to support the submarine fleet. French defense officials have stated that the air-launched Aerospatiale ASMP nuclear [supersonic cruise] missile system will remain operational for the next several decades.

Reuter, 2/23/94; in Executive News Service, 2/23/94 **(4147)**. *Flight International*, 3/2/94, p. 4 **(4147)**. *Arms Control Today*, 4/94, p. 28, **(4147)**.

4/94

Aerospatiale successfully concludes the first phase of the adaption of the Block 2 AM39 Exocet anti-ship missile for deployment on the Alenia/Aermacchi Embracer AMX aircraft. The first phase, which ended with the in-flight release of the missile at the Aermacchi test range in Sardinia, Italy, will be followed by a test firing of the new system. The Block 2 AM39, equipped with a new seeker, improved target discrimination, and resistance to counter-measures, has already been cleared for use with Super Etendard and Atlantique 2 aircraft.

Flight International, 4/12/94, p. 12 **(4049)**.

4/6/94

A senior French defense official states that delays are not expected for Triomphant-class missile launching nuclear submarines (SNLE), although some new programs, such as those pertaining to the development of the M5 ballistic nuclear missile, will be delayed. Deployment of the M5 will probably be delayed from 2005 until 2010. The French prime minister will initiate studies on the land-based version of the M4/M45 missiles, which will replace S3 surface-to-surface missiles based at the Albion platform in 2005.

Le Quotidien De Paris, 4/7/94, p. 4; in JPRS-TND-94-010, 5/5/94, p. 40 **(4132)**. John Ridding, *Financial Times*, 4/20/94, p. 3 **(4141)**.

5/94

The Ariane V64 launch, which is scheduled to carry an Intelsat 7 communications satellite, will be the first launch since the V63 failure in 1/94. The Ariane V65 is due for launch in 6/94, with a payload that includes Japan's BSN3 satellite and the U.S. Panamsat 2 satellite.

Flight International, 3/30/94, p. 23 **(4035)**.

5/24/94

French Defense Minister Francois Leotard states that France intends to develop a long-range cruise missile that can accurately strike strategic targets behind enemy lines. The cruise missiles, which will carry a conventional warhead, will become operational in 2001.

Reuter, 5/24/94; in Executive News Service, 5/24/94 **(4068)**.

France with India

3/94

The Indian Space Research Organisation (ISRO) says that it will use Ariane 4 boosters to launch its Insat 2C and 2D spacecraft in 1995-1996. Three previous Insats have been launched by Ariane.

Aviation Week & Space Technology, 3/14/94, p. 23 **(4167)**.

France with Indonesia

3/94

Indonesian officials have approached Arianespace to jointly plan and build an internationally funded satellite launch base on an eastern island of the archipelago. Due to its near-equatorial location, the launch site would be suitable for launching geostationary-satellites. The launch site is similar to the Russian/international launch site, which is to be based in Papua New Guinea.

Flight International, 3/30/94, p.23 **(4035)**.

France with Israel

3/10/94

French Defense Minister Francois Leotard and Israeli Prime Minister Yitzhak Rabin sign a defense cooperation agreement at the Israeli Ministry of Defense in Tel Aviv. According to military sources in Paris, there are three main areas for cooperation: lasers, drones [RPVs] and optronics. The military sources add that space, new metals, and weapons testing were also areas for cooperation. According to Israeli officials, Israel Aircraft Industries proposes jointly building an SLV for light commercial satellites with Aerospatiale of France. Scientific publications have indicated that the Israeli Jericho missile began as a joint French and Israeli project.

Marjorie Olster, Reuter, 3/10/94 **(4078)**.

France with Saudi Arabia

2/1/94

France and Saudi Arabia sign several contracts worth a total of FFr9 billion ($1.53 billion) to modernize a variety of surface-to-air missiles, two tanker supply ships, and four frigates. Thomson-CSF, Matra, Giat, DCN, and other French contractors will be responsible for the modernization of Saudi equipment. A new contract for FFr6 billion is expected to be negotiated with Thomson-CSF for 1,000 man-years of technical assistance, spare parts, and replacements for Crotale (renamed Shahine by the Saudis) SAMs.

Pierre Tran, Reuter, 2/1/94; in Executive New Service, 2/4/94 **(3985)**. David Buchan, *Financial Times*, 2/2/94, p. 5 **(3985)**.

France with Taiwan

3/94

Reports indicate that France's 1992 "order book" records the sale of a large number of

unidentified missiles to Taiwan. The deliveries, however, are not expected to begin for a few years.

David Buchan, *Financial Times*, 3/2/94 **(4134)**.

HUNGARY

HUNGARY WITH RUSSIA

2/28/94

Russia and Hungary are expected to discuss a Russian offer, first made in 1993, in which Hungary could receive SA-10 'Grumble' S-300 SAMs as repayment for the former Soviet Union's $900 million remaining debt to Hungary.

Ryan Tutak, *Jane's Defence Weekly*, 2/5/94, p. 11 **(4270)**.

INDIA

INTERNAL DEVELOPMENTS

12/6/93

Dr. A.P.J. Kalam, scientific advisor to the Indian defense minister and "father" of India's missile program, emphasizes India's need for integrating its technological strength so that scientific projects can succeed, particularly after the successful test of the Prithvi SSM "a week ago" at Balasore. Kalam also states that India should indigenously develop cryogenic engines and that the third stage of the GSLV would have a cryogenic engine. Kalam clarifies that the cryogenic engines will be used exclusively for India's space program, stating: "Our missile program will never use cryogenic engines. If people abroad say that we would be using it, it is absurd."

Times of India (Bombay), 12/6/93, p. 8 **(4269)**.

1/94

As part of the annual Republic Day Parade in New Delhi, the Prithvi surface-to-surface missile is publicly shown for the first time.

Rahul Bedi, *Jane's Defence Weekly*, 2/19/94, p. 20 **(4104)**.

1/7/94

India cancels a test of the Agni intermediate-range ballistic missile due to an on-board computer system error.

Deccan Chronicle (Hyderabad), 2/20/94, p. 1; in JPRS-TND-94-010, 5/5/94, P. 22 **(4213)**.

2/94

According to India's Air Chief Marshal S.K. Kaul, India is enlarging its aspiring missile program to include an anti-missile system much like the U.S. Patriot system. Kaul states that the Defence and Research Development Organisation (DRDO), which is in charge of India's Integrated Guided Missiles Development Programme (IGMDP), began work on the anti-missile system early in 1994. The eight million rupee ($170 million) IGMDP includes five missiles: the Prithvi (Earth) SSM, the Agni (Fire) SSM, the Trishul (Trident) low-altitude SAM, the Akash (Space) low- to medium-altitude SAM, and the Nag (Snake) anti-tank missile. The liquid-fuel Prithvi has an estimated range of 250 km with a 250 kg or 500 kg payload, and a 150 km range with a 1,000 kg payload. The Agni has a range of 2,500 km, and is capable of striking well within Pakistan's borders. According to the Indian Government, the Agni is a "technology demonstrator" and not a developed weapon. The Agni is expected to be put into service in 1995. India maintains that the threat from China justifies the Indian missile program. According to intelligence sources, China has deployed nuclear missiles in Tibet that are aimed at India. It is reported that in 1988, China carried out military maneuvers for the first time in the Tibetan and Karakoram regions along India's border, and that the maneuvers included missiles with nuclear weapons.

Rahul Bedi, *Jane's Defence Weekly*, 2/19/94, p. 20 **(4104)**.

2/4/94

India conducts a successful test of the Akash SAM, in which the missile performs close to expectations in the more than 100 parameters measured, one exception being propulsion. The Akash has a 25 km-range, two-stage rocket ramjet propulsion, multiple warheads and Rajendra multi-targeting radar, and weighs 650 kg.

Doordarshan Television Network (Delhi), 4/2/94; in FBIS-NES-94-025, 2/7/94, pp. 62-63 **(4210)**.

2/11/94

Indian Air Commodore P.K. Ghosh, Air Commanding Officer of Tughlaqabad Air Force Base, states that the "lifeline" of India's air defense is the Pechora missile. The No. 7 Base Repair Depot at the air base performs maintenance on the Pechora missile, the launcher, and instruments in the control cabin. The one-ton, six-meter long Pechora missile has a range of 25 km and is capable of traveling at Mach 4. It is designed to explode when it gets within 300 m of its target.

Hindustan Times (New Delhi), 2/12/94, p. 5; JPRS-TND-94-006, 3/16/94, pp. 20-21 **(4261)**.

2/19/94

India conducts the second successful test launch, the third test in all, of the Agni IRBM from the Interim Test Range (ITR) at Chandipur-on-Sea. The missile was fired at a sea-based target 1,200 km into the Bay of Bengal. The missile carries a payload weighing twice the estimated weight of a nuclear warhead, which, according to Indian government officials, gives India the ability to deliver a nuclear strike. The test is to validate the missile's re-entry technology.

Deccan Chronicle (Hyderabad), 2/20/94, p. 1; in JPRS-TND-94-010, 5/5/94, p. 22 **(4213)**. *Hindu*, 2/26/94, p. 9 **(4304)**. Vivek Raghuvanshi, *Defense News*, 2/28/94, p. 20 **(4213)**.

2/20/94

A member of the Indian Space Commission, Dr. S.C. Gupta, states, "India is leapfrogging in the most guarded area of space technology and, through its progressive self-reliant approach, it has shown to the world its capability in the launch vehicle technology." According to Gupta, launch vehicle technology had "arrived" in India with the

successful launches of the Satellite Launch Vehicle-3 (NC-3), the Augmented Satellite Launch Vehicle (ASLV), and the partially successful launch of the Polar Satellite Launch Vehicle (PSLV). The ASLV-D4 is expected to be launched in 4/94 and the PSLV-D2 in mid-1994. The successful deployment of the PSLV will give India the capability to launch its own remote-sensing satellites in the one-ton class. In 1980, India had the capability to launch 40 kg payloads; by 1992 that capacity had increased to 100 kg. It is expected that India will have the capability to launch 2,500 kg in 1994.

Hindu (Madras), 2/21/94, p. 4; in JPRS-TND-94-011, 5/16/94, p. 22 **(4108)**.

2/21/94

Indian President Dr. S. D. Sharma's announcement concerning the success of the Agni's missile launch on 2/18/94 receives thundering applause from members of the two Houses of Parliament. Sharma states that India has a solid scientific and industrial infrastructure, and has shown its ability in complex technological fields. Sharma also says, "Restrictions being placed on transfer of technology require us to rely even more on our talents."

Hindu, 3/5/94, p. 9 **(4168)**.

3/94

It is reported that, despite a successful test-launch on 2/19/94, the Agni missile will not yet enter service in the Indian armed forces. India is attempting to reduce the Agni's circular error probable (CEP) by improving its guidance system. Additionally, India plans to convert the Agni to use exclusively solid-fuel, instead of the current solid and liquid-fuel stage combination.

Hindu, 3/12/94, p. 12 **(4292)**.

3/22/94

India opens an advanced space technology laboratory in Bangalore. The laboratory, which will specialize in propulsion systems and cryogenics, is a combined effort of the Indian Space Research Organization (ISRO) and the Institute of Science. The laboratory will also concentrate on means to compress data and process information received from spacecraft.

Space News, 4/4/94, p. 14 **(4022)**.

3/31/94

Dr. Krishnaswamy Kasturirangan replaces U.R. Rao as the chairman of the Indian Space Research Organization (ISRO).

Times of India (Bombay), 3/31/94, pp. 1, 4; in JPRS-TND-94-027, 5/24/94, p. 67 **(4253)**.

4/94

Indian Vice-President K.R. Narayanan, during his visit to Australia, says that India has the right to indigenously develop satellite technology and is critical of efforts to curb India's missile program. Narayanan states that it is peculiar that members of the MTCR should transfer missile technology, while simultaneously objecting to indigenous developments by other countries.

K.K. Katyal, *Hindu*, 4/30/94, p. 5 **(4025)**.

4/4/94

An ISRO annual report states that India will launch its first GSLV, in a demonstration flight, in 1996, with the third stage being powered by a Russian cryogenic engine. India will allocate $60 million to the GSLV program in 1994 out of the $124 million space budget.

Flight International, 3/9/94, p. 17 **(4268)**.

4/9/94

The Indian Minister of State for Defence, Mr. Mallikarjun, maintains that India will not allow external pressure to slow its missile development program. Mallikarjun states that the Prithvi surface-to-surface missile had been successfully tested and now awaits a decision from technical experts on its deployment with the armed forces.

All India Radio Network (New Delhi), 4/9/94; in JPRS-TND-94-010, 5/5/94, p. 21 **(4021)**.

4/94

The Indian Space Department announces in the tenth report submitted to the Indian Standing Committee of Parliament on Science and Technology that India's first indigenously-manufactured cryogenic engine will be ready in four years to power the Geostationary Satellite Launch Vehicle (GSLV).

Pioneer (Delhi), 4/25/94, p. 1; in JPRS-TND-94-011, 5/16/94, pp. 22-23 **(4070)**.

4/20/94

According to the *Hindustan Times*, India has temporarily suspended the Agni missile program and indefinitely postponed further user trials. The suspension is believed to be the result of a shortage in funding. The DRDO had requested $17 million for three additional tests of the missile, but the government has not allocated the money.

AFP (Hong Kong), 4/20/94; in JPRS-TND-94-010, 5/5/94, p. 23 **(4293)**.

5/94

The Defence Research and Development Organization (DRDO) has been successful in demonstrating the fundamental features of the Agni missile, such as the "effective integration" of the missile's various stages and the "re-entry of the warhead and its terminal guidance." The Agni missile has a range of 1,500 km with a payload of one ton or 2,500 km with a payload of 500 kg. India has the option of either deploying a limited number of Agnis soon or sanctioning more tests to improve the missile's design and reliability; it could also follow these two paths simultaneously. The Agni's "aspect ratio" could be improved by decreasing its height and increasing its width. It is believed that India has substantial expertise in solid propulsion technology, which would facilitate the improvement of the "aspect ratio."

C. Raja Mohan, *Hindu* (Madras), 2/21/94, p. 6; in JPRS-TND-94-011, 5/16/94, p. 18 **(4113)**.

5/94

According to Defence Research and Development Organization (DRDO) officials, India's Pilotless Target Aircraft (PTA), the Lakshya (Aim), successfully completed its evaluation trials and is ready to enter production. The Lakshya, flown at speeds of over 500 km/h at 6,000 m, was tested for engagement by air-to-air missiles of the Indian Air Force and the Army's Air Defense Artillery at the interim testing range in Orissa, east India. The Lakshya was designed and developed by the Aeronautical Development Establishment (ADE) in Bangalore, and "is equipped with radar and infrared signature devices to simulate attacking aircraft." At the recent evaluation trials, Lakshya trailed tow-bodies to simulate targets to be engaged by radar-guided and infrared air-to-air missiles. India has collaborated with Israel's aircraft industry on the

Lakshya PTA.

Jane's Defense Weekly, 5/7/94, p. 10 **(4114)**. *India Today*, 5/15/94, p. 21 **(4114)**.

5/94

The Indian Defense Ministry states that the Defense Research and Development Organization (DRDO) successfully tested India's Pilotless Target Aircraft (PTA), carrying out a series of extensive tests at the interim test range at Chandipur. The PTA is now ready for mass production. India plans to market the PTA internationally. The Indian government has chosen the state-owned Hindustan Aeronautics Ltd. Bangalore as the chief contractor for the PTA.

Defence News, 5/2/94, p. 15 **(4010)**.

5/94

It is reported that there are manufacturing disagreements between the three agencies working on the Prithvi: the state-owned Bharat Dynamics Ltd., Hyderabad; the state-owned Hindustan Aeronautics Ltd., Bangalore, which produces the liquid-fuel engines; and the Indian Army. The disagreement will delay the missile's deployment for yet another year. The Prithvi was scheduled for deployment by the end of 1992, but has experienced several delays because of additional testing and changes requested by the Army. Bharat was originally scheduled to provide 260 missiles by 1993. The Prithvi missile is to be India's "front-line battlefield support weapon," but it will not enter the Indian Armed forces in the near future. Indian authorities report that the Prithvi has a range of 150 km (93 mi), placing the range under the MTCR limit of 300 km (186 mi). U.S. analysts believe that the Prithvi could easily be modified by lightening its payload, which would extend the missile's range beyond the 300 km limit set by the MTCR.

Theresa Hitchens and Vivek Raghuvanshi, *Defense News*, 5/23/94, p. 38 **(4107)**.

5/94

India's Aeronautical Development Establishment (ADE) has successfully designed and developed unmanned aerial vehicles (UAVs) that can be converted into cruise missiles by improving their precision guidance and navigation systems, making some structural design and control changes, and adding an engine with greater fuel efficiency. ADE's recoverable Lakshya UAV, which can be surface- or sea-launched, has been developed as a "cost-effective aerial target system for training air-defense artillery and crews of surface-to-air and air-to-air missile systems." A limited series of the Lakshya will be produced by ADE and Hindustan Aeronautics Ltd. (HAL). The Nishant, another Indian UAV, is to go into production in 1995 and was developed by the Indian army to provide battlefield surveillance and reconnaissance.

International Defense Review, 5/94, pp. 6, 9 **(4247)**.

5/4/94

India conducts the second successful launch of the Augmented Satellite Launch Vehicle D-4 (ASLV-D4) from Sriharikota in Andhra Pradesh at 5:30 A.M. completing its flight in 11 minutes, and placing the 113 kg SROSS-C2 space research satellite into orbit. The test succeeds in validating many key subsystems of the rocket.

Aviation Week & Space Technology, 5/9/94, p. 21 **(4208)**. *Hindu*, 5/14/94, p. 5 **(4212)**.

5/8/94

India denies a report by the *Times of India* that a Prithvi missile test, scheduled for 5/14/94, has been delayed. The *Times* report states that Prime Minister P.V. Narasimha Rao's office postponed the test because of concern that it would create tension during his upcoming 5/19/94 visit to Washington.

Reuter, 5/8/94 **(4083)**. UPI, 5/11/94; in Executive News Service, 5/12/94 **(4024)**.

5/10/94

Indian opposition parties ask if the postponement of a scheduled Prithvi surface-to-surface missile test is related to Indian Prime Minister Rao's upcoming visit to the U.S. According to a U.S. State Department spokesman, Rao is expected to discuss nuclear nonproliferation during his visit to the U.S. The State Department said that it is not aware of any relation between Rao's visit and a delay of the Prithvi test. The State Department is aware that the Prithvi missile is being tested, and that preparations for its deployment continue, although there is no evidence that the missile has been deployed.

UPI, 5/11/94; in Executive News Service, 5/12/94 **(4024)**.

5/12/94

Indian Prime Minister P.V. Narasimha Rao states that there will be no delay in the schedule of the Prithvi missile user trials. However, Indian Minister of State for Defense Mallikarjun confirms that the Prime Minister's office attempted to postpone the scheduled 5/14/94 Prithvi trial until Rao's return from his U.S. tour on 5/21/94. In explanation, Mallikarjun states, "Generally major missile launchings are conducted when the Prime Minister is in the country."

Hindu International Edition, 5/21/94, p. 4 **(4274)**.

5/16/94

According to statements by Indian Defense Ministry sources, the Indian Army has ordered 15 Prithvi SSMs, but will eventually need 80 of the missiles.

Theresa Hitchens and Vivek Raghuvanshi, *Defense News*, 5/23/94, p. 38 **(4107)**.

6/94

The Indian Armed Forces will begin deploying over 100 Prithvi SSMs. The range of the Prithvi missile is given as 150-250 km, which conflicts with some other reports. The Prithvi SSMs cost Rs 3 crore each.

India Today, 4/15/94, pp. 36-45 **(4294)**. Theresa Hitchens and Vivek Raghuvanshi, *Defense News*, 5/23/94, p. 38 **(4107)**.

India with France

3/94

The Indian Space Research Organisation (ISRO) says that it will use Ariane 4 boosters to launch its Insat 2C and 2D spacecraft in 1995-1996. Three previous Insats have been launched by Ariane.

Aviation Week & Space Technology, 3/14/94, p. 23 **(4167)**.

India with Israel

3/94

According to Indian military sources, India's Ministry of Defense has approved the procurement of Hunter and Seeker Unmanned Aerial Vehicles (UAVs) from Israel Aircraft Industries (IAI). The Israeli Hunter and Seeker UAVs will help India develop its

Falcon Remotely Piloted Vehicle (RPV) program and the Lakshya advanced Pilotless Target Aircraft (PTA) project.

Rahul Bedi, *Jane's Defence Weekly*, 3/5/94, p. 29 **(4087)**.

India with Russia

9/93

The original deal to transfer two Russian cryogenic rocket engines and technology for indigenous production to India is canceled after the U.S. threatens to impose sanctions against Russia. [However, the two engines and a portion of the technology were delivered before the cancellation goes into effect.] The U.S. considers the deal a violation of the MTCR, as it is feared that the engines will be used to power ballistic missiles, though both India and Russia insist they will be used for space exploration.

Reuter, 3/30/94; in Executive News Service, 3/30/94 **(4018)**.

1/94

The Indian media reports that Russia has agreed to transfer seven cryogenic rocket engines to make up for the canceled cryogenic rocket technology deal. However, Glavkosmos officials have not confirmed that the deal has gone through, stating that they did not know whether the Russian government had approved it.

Reuter, 3/30/94; in Executive News Service, 3/30/94 **(4018)**.

2/94

It is reported that the head of Russia's Glavkosmos, Yuri Koptev, acknowledges that Russia will sell India as many as seven cryogenic boosters as compensation for technical aid Russia "was forced to cancel." India will also receive equipment for the "testing and exploitation" of the engines. The new contract, renegotiated in 12/93, is awaiting approval by both Russia and India. The new contract includes four ready-to-fly engines and two "mock-up" versions for the previously agreed $80 million; ISRO will have the option to buy these additional engines for $3 million each. Russia will deliver the three additional engines to India in 1996 after the main contract has been fulfilled.

Vladimir Radyuhin, *Hindu* (Madras), 1/6/94, p. 1; JPRS-TND-94-005, 2/25/94, p. 54 **(3999)**. Reuter, 3/30/94; in Executive News Service, 3/30/94 **(4018)**. *Hindu*, 4/9/94, p. 12 **(4058)**.

3/22/94

Negotiations conclude on the deal to supply India with Russian cryogenic rocket engines.

Radio Rossii Network (Moscow), 3/25/94; in JPRS-TND-94-008, 4/1/94, p. 53 **(4018)**.

3/30/94

The outgoing head of the Indian Space Research Organization (ISRO), U.R. Rao, says that a new agreement has been signed with Glavkosmos chief Alexander Dunayev for the purchase of rocket engines. The first of the engines is to be transferred to India in 1996, with the remainder delivered over a three-year period. Rao says that the engines will be used to launch Indian satellites by 1996.

Reuter, 3/30/94; in Executive News Service, 3/30/94 **(4018)**. *Hindu*, 4/9/94, p. 12 **(4058)**.

5/11/94

According to Indian defense analyst Durga Prased Singh, India now has the expertise to maintain their Russian-built air defense missiles "and the Russians want India to extend their expertise to the other Asian nations which have these missiles." Reports indicate that during Indian Prime Minister Narasimha Rao's upcoming visit to Moscow in 6/94, India and Russia are expected to agree on broad weapon co-production agreements. Specifically the agreements will cover Indian assembly and maintenance of Russian anti-aircraft missiles and Kilo-class submarines.

Defense News, 5/16/94, p. 2 **(4112)**.

India with United States

4/6/94

U.S. Deputy Secretary of State Strobe Talbott arrives in India to try to dissuade India from deploying its indigenously developed short-range Prithvi missile and intermediate-range Agni missile. In exchange for not deploying its missiles, India would receive some high-tech components from the U.S., conceivably for the new light combat aircraft that India plans to produce.

Washington Times, 4/16/94, p. A8 **(4120)**.

4/21/94

Indian Prime Minister P.V. Narasimha Rao denies having given the U.S. assurances that India will halt the testing of the Agni missile, and also denies that the U.S. is putting pressure on India to halt the testing.

Hindu, 4/30/94, p. 1 **(4283)**.

5/6/94

U.S sanctions imposed on India and Russia following their original cryogenic rocket engine deal expire.

Defense News, 5/2/94, p. 2 **(4020)**.

INDONESIA

Indonesia with France

3/94

Indonesian officials have approached Arianespace to jointly plan and build an internationally funded satellite launch base on an eastern island of the archipelago. Due to its near-equatorial location, the launch site would be suitable for launching geostationary-satellites. The launch site is similar to the Russian/international launch site, which is to be based in Papua New Guinea.

Flight International, 3/30/94, p.23 **(4035)**.

IRAN

Internal Developments

2/25/94-2/29/94

Iranian manufactured rocket fuel is used for the first time when an advanced anti-ship missile is fired during the Thamen al-A'emmeh exercise in the Strait of Hormuz.

The Navy of the Islamic Republic of Iran and the Islamic Revolution Guard Corps conduct the missile firing with "full success" and reportedly "precisely hit the hypothetical enemy."

Voice of the Islamic Republic of Iran First Program Network (Tehran), 4/29/94; in FBIS-NES-94-084, 5/2/94, p. 100 **(4013)**.

4/94

Iran has modified the Soviet-made Scud-B and FROG-7 SSMs, and has also domestically developed and produced other rockets, missiles, and multiple rocket launcher (MRL) systems. In addition to the 34 km range Oghab system and its updated version, the Mushak-120 SSM, Iran has also produced the Naze'at rocket family, which may include the 40 km range R'aad rocket and the 13 km range Shahin-1 and 20 km range Shahin-2 rockets. Iran also produces the 122 mm Hadid, Noor, and Arash MRLs and the 107 mm Fajr-3 and Haseb MRLs. The 30-round 122 mm Hadid MRL uses tubes from the Russian BM-21 and is mounted on a Mercedes-Benz 2624 6x6 truck. It is also speculated that Iran may currently have two rocket research programs.

Anoushiravan Ehteshami, *International Defense Review*, 4/94, pp. 72-73 **(4181)**.

IRAN WITH IRAQ

1/94

Forces from Jalal Talabani's Patriotic Union of Kurdistan and those aligned with Peshmerga minister Jabbar Farman take over positions held by Al-Mullah Osman Abdulaziz's Islamic Movement of Iraqi Kurdistan in Erbil and Suleimaniya, where they capture 152 mm, 132 mm, 130 mm, and 120 mm cannon, Grad missiles, and Katyusha rockets. According to documents seized from the camps, Abdulaziz's movement was receiving $2 million a month from Iran.

Intelligence Newsletter, 2/10/94, p. 7 **(3992)**.

IRAN WITH LIBYA

4/94

Unconfirmed reports suggest that Iran and Libya are undertaking a joint venture, in Iran, to develop the German-designed 950 km range Al-Fateh missile project.

Anoushiravan Ehteshami, *International Defense Review*, 4/94, pp. 72-73 **(4181)**.

IRAN WITH NORTH KOREA

2/94

The commander of the North Korean Air Force, General Cho Myong-rok, leads a 29-man team of military and nuclear experts to Iran, and, according to the Paris-based Arabic newspaper *Al-Watan Al-Arabi*, formed "new agreements to intensify military and nuclear cooperation." According to Arabic and Western diplomatic sources, the delegation most likely went to Iran in order to discuss testing of the Nodong-2 ballistic missile in Iran; some reports indicate that the Nodong-1 was the missile discussed.

Washington Times, 2/25/94 **(4296)**.

2/24/94

Iranian Revolutionary Guard Corps head Major General Mohsen Reza'i denies allegations in the Western press that Iran may have or will in the future provide North Korea with the necessary facilities to test 1,000 km range [Nodong-1] missiles. Reza'i states, "By now the entire world should know that Iran is very sensitive as far as our soil and military facilities are concerned and we will never allow others to use it . . . no matter how friendly 'others' are."

Tehran Times (Tehran), 2/24/94, pp. 1, 14; in JPRS-TND-94-006, 3/16/94, pp. 52-53 **(4177)**.

4/94

North Korea has offered to co-produce the Nodong-1 missile with Iran and has aided Iranian efforts to develop the long-range Scud-C and other Scud-type missiles.

Anoushiravan Ehteshami, *International Defense Review*, 4/94, pp. 72-73 **(4181)**.

4/11/94

Jane's commentator Paul Beaver states on Japan's Fuji Television that Iran and the DPRK have agreed to build a production plant for the Nodong-1 missile in Iran. According to Beaver, the project is being secretly promoted under the codename "Ronda-68" [as translated].

KBS-1 Radio Network (Seoul), 4/11/94; in JPRS-TND-94-010, 5/5/94, p. 47 **(4225)**.

IRAN WITH PRC

3/23/94

Chinese Ambassador Li Daoyu refutes charges that China is a "key proliferator of destabilizing weapons and technology" to the Middle East, and said that China is not supplying M-11 ballistic missile technology to Pakistan or M-9 ballistic missile technology to Iran. Ambassador Li also stated that China is not supplying Iran with "chemical weapons precursors."

Security Affairs, 4/94, p. 3 **(4198)**.

4/94

China has helped Iran establish a Scud-B missile production line and assisted in the development of the Oghab (Eagle) rocket system.

Anoushiravan Ehteshami, *International Defense Review*, 4/94, pp. 72-73 **(4181)**

IRAN WITH SYRIA

3/94

It is reported that Iran and Syria are jointly developing a cruise missile based on imported technology from Japan and Europe.

Security Affairs, 4/94, p. 11 **(3986)**.

IRAQ

IRAQ WITH IRAN

1/94

In the Iraqi villages of Erbil and Suleimaniya, fighting among Kurdish separatists leads to the seizure of 152 mm, 132

mm, 130 mm, and 120 mm cannon, Grad missiles, and Katyusha rockets. Evidence is also revealed that one of the Kurdish combatants, Al-Mullah Osman Abdulaziz's Islamic Movement of Iraqi Kurdistan, was receiving $2 million a month over an unspecified period of time from Iran. Forces from Jalal Talabani's Patriotic Union of Kurdistan and those aligned with Peshmerga minister Jabbar Farman take over positions held by Abdulaziz, capturing the munitions and discovering documentation of the Iranian aid to Abdulaziz.

Intelligence Newsletter, 2/10/94, p. 7 **(3992)**.

IRAQ WITH RUSSIA

2/94

The former Soviet military attache to Baghdad, Colonel Viktor Patzalyuk, who has a close relationship with the Iraqi general staff, states that Russia obtained an undamaged engine from an unexploded U.S. cruise missile that was launched during the Gulf War.

Viktor Patzalyuk, *Jane's Defence Weekly*, 2/19/94, pp. 24-25 **(4102)**.

IRAQ WITH UNITED NATIONS

2/17/94

The twenty-first UNSCOM ballistic missile inspection team, led by Patrice Palanque of France, begins its assessment of Iraqi missile production capabilities. The inspection concludes on 4/8/94.

United Nations Press Release IK/166, SC/5802, 3/8/94 **(4089)**. Randall Palmer, Reuter, 4/18/94; in Executive News Service, 4/21/94 **(4088)**.

2/25/94

The twenty-first ballistic missile inspection team, led by Patrice Palanque of France, concludes its assessment of the missile production capabilities of 14 sites in the vicinity of Baghdad. The team sought to establish effective monitoring practices at sites identified by UNSCOM as likely support facilities for Iraq's current missile production program. The acquired data from the inspection will also aid in UNSCOM's operational planning for current monitoring and verification activities in Iraq.

United Nations Press Release IK/166, SC/5802, 3/8/94 **(4089)**.

4/14/94-4/19/94

The Government of Iraq and the U.N. hold high-level discussions in New York, including seven meetings held by the missile working group to discuss "issues related to ongoing monitoring and verification, forthcoming inspection activities and Iraq's disclosure of prohibited programs." During the talks, Iraq submits a new declaration to UNSCOM which accounts for all prohibited missiles acquired and used by Iraq.

U.N. Security Council (S/1994/341), 3/24/94, pp. 7, 12-13 **(4182)**.

4/18/94

A 14-member UNSCOM ballistic missile team, led by John Larrabee, returns to Iraq for a second round of long-term monitoring preparations. Larrabee hopes to finalize recommendations for the monitoring of Iraq's missile program by the end of 5/94. Iraq has agreed to the long-term monitoring of its plants and facilities; however, UNSCOM requires at least six months to one year to verify Iraq's "good intentions" before it can certify compliance.

Randall Palmer, Reuter, 4/18/94; in Executive News Service, 4/21/94 **(4088)**.

5/21/94

The missile team, led by John Larrabee, departs Iraq after conducting a three-mission long inspection of facilities. Larrabee states that the facilities were associated with the "production of missiles or had the technology that was associated (and) could be used in the future for production of missiles."

Abbas Salman, Reuter, 5/23/94; in Executive News Service, 5/24/94 **(4214)**.

5/23/94

A six-member UNSCOM ballistic missile team, led by American Guy Martelle, arrives in Iraq to establish "the technical reference baseline for every Iraqi missile system." The baseline will enable inspectors to measure any future Iraqi missile activity.

Abbas Salman, Reuter, 5/23/94; in Executive News Service, 5/24/94 **(4214)**.

IRAQ WITH UNITED STATES

2/94

U.S. Ambassador to the U.N.-sponsored Conference on Disarmament Stephen Ledogar states that Iraq has failed to account for nearly 100 Scud missiles and has not fully complied with U.N. resolution 687. Ledogar further states that it will take six months to establish a monitoring regime in Iraq and at least a year before the oil embargo is lifted.

Mitya New, Reuter, 2/17/94; in Executive News Service, 2/21/94 **(4217)**.

ISRAEL

INTERNAL DEVELOPMENTS

2/94

The Israeli navy takes delivery of the new Nirit-class missile boat, which is equipped with "sophisticated" warfare systems, including an electronic combat system, a ship-detecting radar system, a control and monitoring system, and "aircraft" and missiles. The Nirit ships are armed with Gabriel and Harpoon anti-ship missiles and Vulcan, Phalanx, and Barak air defense systems.

Ha'aretz (Israel); in Middle East Intelligence Report, 2/8/94 **(4295)**.

2/1/94

An Israeli official states that by the end of 1994, Israel intends to launch the Arrow-2. The development of the Arrow ATBM, specifically designed to destroy Scud-type missiles, has been funded by the U.S. The official states that the Arrow-2 is smaller than the Arrow-1, but is designed to fly faster, higher, and further. The Arrow-2, if successful, would be the first weapon specifically designed to defend against the Scud, and could be deployed as early as 1997.

Washington Times, 2/2/94, p. A13 **(4158)**.

2/7/94

A senior Israeli navy official states that the Barak missile successfully completed three

series of tests at the end of 1993. In the final three tests, the Barak was fired from a naval platform at Gabriel missiles. The Barak performed well, intercepting a Gabriel missile in one test and nearly hitting the targets in the other two tests. The Barak missile was jointly developed by Rafael and Israel Aircraft Industries, and has a range of 10 km.

On Levi, *Davar* (Tel Aviv), 2/8/94, p. 5; in FBIS-NES-94-027, 2/9/94, p. 33 **(4161)**.

3/94

A test of the Arrow ATBM failed due to a fault in a ground-based computer. Israel plans to test the missile again in 6/94.

Flight International, 5/18/94, p. 16 **(4160)**.

Israel with France

3/10/94

French Defense Minister Francois Leotard and Israeli Prime Minister Yitzhak Rabin sign a defense cooperation agreement at the Israeli Ministry of Defense in Tel Aviv. According to military sources in Paris, there are three main areas for cooperation: lasers, drones [RPVs] and optronics. The military sources add that space, new metals, and weapons testing were also areas for cooperation. According to Israeli officials, Israel Aircraft Industries proposes jointly building an SLV for light commercial satellites with Aerospatiale of France. Scientific publications have indicated that the Israeli Jericho missile began as a joint French and Israeli project.

Marjorie Olster, Reuter, 3/10/94 **(4078)**.

Israel with India

3/94

According to Indian military sources, India's Ministry of Defense has approved the procurement of Hunter and Seeker Unmanned Aerial Vehicles (UAVs) from Israel Aircraft Industries (IAI). The Israeli Hunter and Seeker UAVs will help India develop its Falcon Remotely Piloted Vehicle (RPV) program and the Lakshya advanced Pilotless Target Aircraft (PTA) project.

Rahul Bedi, *Jane's Defence Weekly*, 3/5/94, p. 29 **(4087)**.

Israel with Lebanon

4/15/94

Unidentified forces fire Katyusha rockets into northern Israel. According to [Israeli] security sources, three other Katyusha rockets landed 500 yards from the Israeli border near the town of Marwaheen, Lebanon.

AP, 4/15/94; in *New York Times*, 4/16/94, p. 4 **(4054)**.

Israel with North Korea

3/94

Israeli diplomats meet with senior North Korean officials in Beijing in an effort to bring about an agreement that would prevent Iran from acquiring 1,000 km range Nodong missiles from North Korea. In return for halting Nodong shipments to Iran, Israel is hoping to raise $1 billion among U.S. Jewish businessmen for North Korean civilian projects. The secret talks are being held despite U.S. objections. Secret Israeli-North Korean talks began approximately two years ago.

IDF Radio (Tel Aviv), 3/22/94; in JPRS-TND-94-008, 4/1/94, p. 34 **(4009)**.

3/22/94

The Israeli Foreign Ministry denies that Israel and North Korea are still conducting secret talks over the North Korean sale of Nodong missiles to Iran.

IDF Radio (Tel Aviv), 3/22/94; in JPRS-TND-94-008, 4/1/94, p. 34 **(4009)**.

Israel with South Africa

2/94

It is reported that South Africa developed a version of the Israeli Jericho missile with extensive Israeli help. The South African version of the Jericho was jointly tested by Israel and South Africa in 7/89 at the Overberg test range in South Africa. U.S. officials say that one of the "several" missiles that Israel was helping South Africa to develop was intended to carry a nuclear payload.

Paul Stober and Jane Hunter, *Weekly Mail & Guardian* (Johannesburg), 2/18/94, p. 6; in JPRS-TND-94-006, 3/16/94, pp. 55-56 **(4053)**.

3/94

A South African spokesman for 16 nuclear and missile scientists states that Israel had supplied South Africa with rocket technology as well as details on how to convert a space launch vehicle into a nuclear ballistic missile. According to the spokesman, the South African space program originally intended to use a "clone" of the Israeli two-stage solid-fuel Jericho-2 missile as a delivery system for nuclear weapons. In 1988 and 1989, two mobile launchers were built and tested at the Armscor test site at Advena, but were never used. The missile, code named RSA3, only underwent static testing. According to the spokesman more than 200 South Africans secretly visited Israel and worked on the missile program from 1989 to 1992. Israel also sold technology to South Africa that would make its missiles accurate to within one kilometer by using a system of explosives that could separate the warhead from the missile at designated point in the flight path for targeting purposes.

Sunday Times (Johannesburg), 3/27/94, pp. 1-2; in JPRS-TND-94-008, 4/1/94, pp. 1-2 **(4074)**.

Israel with Turkey

4/94

It is reported that Turkey and Israel intend to expand their political, economic, and trade ties, as the two countries are planning to hold negotiations in 5/94 concerning Turkey's purchase of the Cobra Night Targeting System from Israel. The Cobra system enables Cobra helicopters to acquire targets and guide missiles in either day or night. Israel also hopes to sell unmanned aerial vehicles, and electronic countermeasure, and radar warning systems to Turkey.

Barbara Opall, *Defense News*, 4/25/94, pp. 1, 34 **(4029)**.

Israel with United Kingdom

5/26/93

In a written statement given to the UK House of Commons, Foreign Secretary Douglas Hurd announces the end of the 12-year UK arms embargo on Israel. The decision will allow the UK to sell arms to Israel and to purchase Israeli arms. The UK may be in-

terested in purchasing a variant of the Israeli Popeye missile, which was designed by Rafael Armament Development Authority in Haifa, to fulfill the RAF's requirement for a conventional stand-off missile for the Tornado fighter. According to Rafael spokesman Noah Shachar, information on Popeye was given to the UK as a result of a request for information (RFI).

Sharone Parnes and Michael J. Witt, *Defense News*, 5/30/93, pp. 3, 26 **(4163)**.

ISRAEL WITH UNITED STATES

1/94

At a summit meeting with Syrian President Hafez al-Assad, U.S. President Clinton declares that the U.S. has agreed to open up space project "tenders" to Israeli technology that had previously been banned.

Bradley Burston, Reuter, 1/25/94 **(4076)**.

1/16/94

In a letter to Israeli Prime Minister Yitzhak Rabin, President Clinton states that the U.S. will implement a policy change permitting imports of equipment such as the Israeli Shavit launch vehicle. According to U.S. State Department officials, the U.S. policy change occurred because the imports are not considered to be a proliferation risk. A deal by the Atlantic Research Corporation to purchase the manufacturing rights for an apogee kick motor from Rafael Armament Development also prompted the policy change. The policy change has been criticized by proliferation experts, such as Henry Sokolski, who claims that it "runs against the spirit of the Missile Technology Control Regime."

John J. Fialka, *Wall Street Journal*, 2/2/94, p. A12 **(4151)**.

4/94

The U.S. Ballistic Missile Defense Organization (BMDO) is evaluating an Israeli request that the Israeli Test Bed (ITB), an anti-tactical ballistic missile simulator, be made available for use by "third-countries." The simulator was built to BMDO specifications by Tadiran, an Israeli company, with $35 million from the BMDO. The ITB allows the simulation of tactical surface-to-surface missile attacks in different defense situations and gives Israel and the U.S. the ability to design and test tactical missile defense "system architecture." The ITB is part of U.S. assistance to Israel for the development of an anti-tactical ballistic missile capability, of which the Arrow missile is the central piece.

Flight International, 4/27/94, p. 18 **(4162)**.

5/24/94

Director of the U.S. Ballistic Missile Defense Organization (BMDO) Lt. Gen. Malcolm R. O'Neill states that if the Israeli Arrow program is to continue to receive BMDO funding, it must demonstrate a successful intercept. Additionally, BMDO requires a memorandum of understanding (MoU) delineating U.S. and Israeli roles in the Arrow program, and "certification" that no program technology will be transferred to third countries.

Aerospace Daily, 5/25/94, p. 307 **(4233)**.

6/94

Israeli Aircraft Industries and Rafael are to complete a "preliminary feasibility" study of the use of missile-equipped UAVs to intercept theater ballistic missiles. The $6 million study is funded by the Israeli government and the U.S. Ballistic Missile Defense Organization.

Flight International, 5/4/94, p. 13 **(4135)**.

ITALY

ITALY WITH SINGAPORE

3/94

The Singapore Navy is considering proposals by the Italian company, Simmel Difesa, for a naval version of the Firos-30 ground-launched rocket system. Simmel Difesa and Breda, another Italian company, co-developed a stabilized naval launch platform using Breda's 105 mm SCALR multi-purpose rocket launcher. The stabilized platform can house one or two modules, each of which consists of 20 tubes that launch Firos-30 122 mm rockets with a range of 34 km. Simmel Difesa developed the Firos 30 rocket for the U.K.'s Royal Ordinance.

Jane's Defence Weekly, 3/5/94, p. 11 **(4034)**.

ITALY WITH YUGOSLAVIA

2/12/94

Italian Defense Minister Fabio Fabbri claims that the Serbian army does not have missiles with ranges capable of targeting Italy. In the spring of 1993, Seselj, the leader of the Serbian ultra-nationalist Radical Party, threatened to fire missiles at Italy.

Reuter, 2/12/94; in Executive News Service, 2/15/94 **(4027)**.

JAPAN

INTERNAL DEVELOPMENTS

1/31/94

Stormy weather forces Japan to postpone the maiden launch of the indigenously manufactured H-2 space launch vehicle. The H-2 is Japan's first launch vehicle capable of lifting large satellites into orbit and is scheduled to carry equipment to test heat shields that will be used on a re-entry spacecraft. Japan's space agency states that it will reschedule the H-2 launch from the southern island of Tanegashima; 2/2/94 is the earliest possible launch.

Wall Street Journal, 2/1/94, p. A10 **(4042)**.

1/31/94

Japanese Foreign Ministry spokesman Terusuke Terada criticizes a report released in the *Independent*, a British daily, that stated that Japan's indigenous satellite launch vehicle, the H-2, could lead to an arms race in East Asia. Japan plans to launch the H-2 in early 2/94. Terada says, "The article is grossly simplistic and misleading in that it associated the Japanese launching of the H-2 rocket with the development of an ICBM

(intercontinental ballistic missile) capable of delivering nuclear warheads."

Reuter, 2/1/94 **(4016)**.

2/94

It is reported that much of the H-2's technology can be used in "state-of-the-art" weaponry, which could raise questions about Japan's military intentions. However, there is no evidence that Japan intends to use H-2 technology for military purposes. Professor Masamitsu Yamashita of the National Institute for Defense Studies said, "There will be no military use of the H-2."

Kumiko Makihara, *Time*, 2/7/94, p. 24 **(4037)**.

2/94

It is reported that the H-2 is a two-ton, two-stage space launch vehicle. The engine of the H-2 uses liquid hydrogen and oxygen that produces 86 tons of thrust, which can launch a two-ton satellite into a geostationary orbit. Japan plans to use the H-2 to compete in the commercial launch business, as a rival to France's Ariane 4 rocket. The H-2 can carry the same payload as the Ariane 4, but the Ariane 4 weighs almost twice as much as the H-2. A disadvantage of the H-2 is that it costs $156 million, approximately 50 % more than the Ariane 4. It is expected that once Japan's H-2 program gets started, the cost will come down.

Kumiko Makihara, *Time*, 2/7/94, p. 24 **(4037)**.

2/94

Japan's Finance Ministry approves a $1.52 billion budget request for the National Space Development Agency (NASDA) for 1994, an eight percent increase over the 1993 NASDA budget. The majority of NASDA's budget increases in the last few years have been devoted to the development of the H-2 space launch vehicle, as well as the Japanese Experiment Module, Japan's space lab. Development of the H-2 is now complete and more money will be devoted to other space projects. H-2 spending reached its peak in 1992 at $261 million before falling to $157 million in 1993. NASDA is expecting H-2 annual costs to drop to $15 million with the completion of the H-2. A large portion of the budget increase will be devoted to the Advanced Earth Observing Satellite 2, which is scheduled for launch on the H-2 launch vehicle in 1999. The first Earth Observing Satellite is expected for lift-off on the H-2 in 1996. Another satellite, the High Resolution Observation Satellite, was approved by the Japanese government at a cost of $3.2 million and is expected for launch on the H-2 in 1999. The H-2 will launch the Communications and Broadcasting Engineering Test Satellite in 1997. In late 8/94 or early 9/94, the H-2 is scheduled to carry the Engineering Test Satellite-6 into orbit.

Andrew Lawler, *Space News*, 2/21/94, pp. 1, 20 **(4109)**.

2/1/94

The scheduled take-off of the Japanese H-2 is delayed for two days due to low clouds and high winds. Another one-day delay is the result of a mechanical problem occurring just before fueling.

Aviation Week & Space Technology, 2/7/94, p. 17 **(4031)**.

2/4/94

Japan launches its first independently developed large rocket, the H-2, at 7:20 AM from the southern Japanese island of Tanegashima. According to Japanese National Space Development Agency (NASDA) President Masato Yamano, the launch of the H-2 was a "100% success." The H-2 is the first Japanese rocket capable of launching large communication and Earth-observing satellites into orbit. Japan would like to compete in the commercial satellite launch market and is considering the deployment of its own military reconnaissance satellites, freeing Japan from reliance on U.S. intelligence regarding threats such as North Korea. The H-2 is a two-stage rocket. The first stage of the rocket uses a staged-combustion cycle engine fueled by liquid oxygen and liquid hydrogen. According to initial reports, the closed cycle LE-7 first stage engine performed nominally. The reports also indicated that the LE-7, together with the first stage's twin strap-on boosters, produced a nominal 803,000 pounds of thrust within 1 sec. of lift-off. The second stage of the rocket is called the LE-5, a modified version of the engine used on Japan's H-1 rocket. The LE-5 engine also performed nominally. Unlike NASA, the Japanese National Space Development Agency (NASDA) will not recover the boosters or engines for reuse because of high recycling costs. The H-2 carried a 5,280 pound Vehicle Evaluation Payload (VEP) that achieved a 279 x 22,320 mi geostationary transfer orbit. The VEP was designed to test accurate placement of payloads into a geostationary transfer orbit. The second payload carried by the H-2 was the Orbital Reentry Experiment (OREX), which completed one orbit around the Earth at 282 mi and then re-entered the atmosphere. Japanese officials insist that the H-2 is strictly for non-military use and that the technology will not be used for manufacturing military missiles. The former Japanese head of NASDA, Yasuhiro Kuroda, says that to convert the H-2 for manned space missions, the LE-7 main engines would need considerable re-designing and a "better safety margin." According to Kuroda, the H-2 "has better reliability than the Redstone," the first U.S. manned launch vehicle. Kuroda says that "man-rating" the H-2's engine would most likely necessitate a "10-fold increase in its development budget." To date, Japan has spent roughly $2.5 billion on the H-2's development. The 164 ft H-2 space launch vehicle does not experience the "Max-Q" aerodynamic stress that the U.S. space shuttle encounters and as a result does not have to throttle back in flight. The H-2's twin solid rocket boosters have a burn profile that controls initial thrust and minimizes acceleration forces. The H-2 rocket was developed by Rocket Systems Corp., a consortium led by Mitsubishi Heavy Industries Ltd. consisting of more than 70 companies.

Michael Mecham, *Aviation Week & Space Technology*, 2/14/94, p. 30 **(4031)**. *Aviation Week & Space Technology*, 2/7/94, p. 17 **(4031)**. Andrew Pollack, *New York Times*, 2/4/94, p. A8 **(4039)**. Andrew Lawler, *Space News*, 2/7/94, pp. 1, 20 **(4039)**. Wahei Sakurai, Reuter, 2/4/94; in Executive News Service, 2/4/94 **(4039)**. UPI; in Executive News Service, 2/4/94 **(4039)**.

4/94

In the Japanese Ground Self Defense Force (JGSDF), a new coastal missile unit equipped with the Type 88 anti-ship coastal defense missile is established on the same day that the 45th Infantry is retired. The 45th Infantry is the first of five units to be

disbanded under former-Prime Minister Morihiro Hosokawa's plan to reduce personnel strength through the introduction of new technologies.

Jane's Defence Weekly, 4/9/94, p. 12 **(4041)**.

4/94

Kawasaki Heavy Industries finishes the design and factory tests on an adaptive fairing, the first in a series of fairings, for the Japanese H-2 cryogenic launch vehicle. Kawasaki has designed three alternative fairings, in cooperation with Japan's National Space Development Agency (NASDA), to carry single and double payloads that are 4 m and 5 m in diameter.

Eiichiro Sekigawa, *Aviation Week & Space Technology*, 4/18/94, p. 56 **(4259)**.

JAPAN WITH IRAN AND SYRIA

3/94

It is reported that Iran and Syria are jointly developing a cruise missile based on imported technology from Japan and Europe.

Security Affairs, 4/94, p. 11 **(3986)**.

JAPAN WITH NORTH KOREA

2/12/94

Japanese Prime Minister Morihiro Hosokawa states that the DPRK has tested a missile with a range of 1,500 km, and that it is "another source of concern, great concern for us [Japan]."

Reuter, 2/12/94 **(4227).**

2/22/94

Former Japanese Foreign Minister Michio Watanabe recommends that the Japanese government tighten inspections of luggage and cargo shipped to North Korea in order to prevent the smuggling of Japanese high technology. Watanabe makes this recommendation following the 1/94 police raids of Japanese "trading houses" and manufacturers of high-technology equipment accused of illegally shipping spectrum analyzers to North Korea. North Korea may be using spectrum analyzers to improve the accuracy of its Nodong missiles. Korean residents are suspected of smuggling hidden equipment in their luggage on a ferry from the Japanese port of Niigata to North Korea.

UPI, 2/22/94, **(4014)**.

JAPAN WITH UNITED STATES

2/94

Japanese National Space Development Agency spokesman Shoshin Sonoda states that the drive of the H-2 program is "to break from under the U.S. umbrella." The launching of the H-2 signals the end of Japanese dependence on U.S. space technology. The earlier Japanese H-1 booster engine was designed by the U.S.'s McDonnell Douglas. A bilateral agreement between the U.S. and Japan allows the U.S. to restrict the commercial use of such rocket technology.

Kumiko Makihara, *Time*, 2/7/94, p. 24 **(4037)**.

2/94

Kyodo News Service announces that Japan's ruling coalition has allocated funds in the 1994 defense draft budget for the purchase of Patriot missiles and two additional Airborne Warning and Control System (AWACS) electronic surveillance planes from the U.S. The surface-to-air Patriot missiles will enhance Japan's ability to counter attacks made by missiles and planes.

Washington Times, 2/11/94, p. A18 **(4015)**.

4/94

The chief of Dual-Use Technology Policy/International Programs at the U.S. Pentagon, Kenneth Flamm, is to lead a Pentagon delegation to Japan to discuss a proposed joint U.S. and Japanese Theater Missile Defense (TMD) program. Flamm is trying to move ahead with the "Perry Initiative," a plan to exchange U.S. military technology for Japanese commercial dual-use technology. The Perry Initiative focusses on the transfer to the U.S. of opto-electronics, composite materials, and manufacturing technologies from Japanese commercial industries in exchange for U.S. military technology. According to a U.S. diplomatic source, the Pentagon is eager to reach a deal with the Japanese Defense Agency on TMD because of North Korea's test of the Nodong-1, an intermediate-range ballistic missile. The Japanese constitution forbids the sale of weapons or weapons technology abroad, and even "non-lethal" technologies to be shared with or sold to the U.S. are intensely debated by the Japanese Diet. Another problem facing Japan is the possibility that TMD would include a space-based component which would be forbidden by Japanese law as it constitutes a "militarization" of space. The U.S. states that any space-based component would be supplied solely by the U.S., thus avoiding any violation of Japanese law. A diplomatic source says that Japan has been "exemplary" in the manner in which it has handled technology given by the U.S., such as the Aegis ship-based air defense system, Patriot missile system and AWACS surveillance planes.

Aerospace Daily, 3/15/94, pp. 397-398 **(4017)**.
Inside The Pentagon, 3/3/94, p. 3 **(4017)**.

4/94

U.S. Deputy Assistant Secretary of Defense Kenneth Flamm states, "We [the U.S.] will offer unprecedented access to our military technology in exchange for some key dual-use technology for use in our defense." Flamm is referring to the U.S.-initiated "Technology for Technology" from which the U.S. hopes to gain access to cutting edge Japanese technology such as electronics for flat panel displays, composite materials for aircraft, and ceramics for use in engines.

David Holley, *Los Angeles Times*, 5/23/94, p. D3 **(4033)**.

KAZAKHSTAN

KAZAKHSTAN WITH RUSSIA

2/94

Russia moves 40 Tu-95-MS bombers armed with nuclear cruise missiles from Kazakhstan to Russia.

Reuter, 4/6/94 **(4098)**.

KUWAIT

INTERNAL DEVELOPMENT

3/22/94

Kuwait's National Assembly passes a bill that provides an $11.7 billion supplementary defense budget for weapons procurement and military training.

Financial Times, 4/12/94, p. 7 **(4038)**.

4/11/94

The Emir of Kuwait, Sheik Jaber Al-Ahmed Al-Sabah, signs the 3/22/94 weapons procurement and military training bill into law. The passage of the bill into law signals an end to an eight-month freeze on Kuwait's 12-year rearmament program. By signing the bill, the Emir and the Ministry of Defense agreed to pace their spending over twelve years and to allow greater parliamentary oversight. Among the various weapons systems that Kuwait is considering for purchase in the upcoming years are six Hawk air defense missile batteries, eight missile attack boats, a multi-launch rocket system, and missiles and spare parts for systems it has already purchased. Kuwait is expected to take bids on the missile attack boats in late 1995 or early 1996, with delivery by the end of the decade.

Defense News, 4/18/94, pp. 1, 44 **(4038)**. Francis Tusa, *Armed Forces Journal*, 4/94, p. 14 **(4038)**.

KUWAIT WITH RUSSIA

2/94

It is reported that Russia recently sold Kuwait five S-300 missile systems after the two countries conducted joint naval exercises in the Persian Gulf. Kuwait's interest in Russian equipment marks a dramatic shift in its post-Gulf War policy of establishing an entirely Western-equipped military.

Jury Sigov, *Washington Times*, 2/22/94, p. A13 **(3949)**. Philip Finnegan, *Defense News*, 4/25/94, pp. 1, 37 **(4040)**.

4/94

Kuwait and Russia are holding discussions on the purchase of BM-30 Smerch rocket systems, 2S6 surface-to-air missiles, air defense radars, and additional equipment. Kuwait is likely to negotiate a debt reduction plan with Russia, as it did prior to the Gulf War when it obtained Soviet SA-11 surface-to-air missiles.

Francis Tusa, *Armed Forces Journal*, 4/94, p. 14 **(4038)**.

4/94

According to Washington diplomatic sources, the Kuwaiti military plans to buy 27 Russian 300 mm multiple-launch rocket systems.

Philip Finnegan, *Defense News*, 4/25/94, pp. 1, 37 **(4040)**.

LEBANON

LEBANON WITH ISRAEL

4/15/94

Unidentified forces fire Katyusha rockets into northern Israel. According to [Israeli] security sources, three other Katyusha rockets landed 500 yards from the Israeli border near the town of Marwaheen, Lebanon.

AP, 4/15/94; in *New York Times*, 4/16/94, p. 4 **(4054)**.

LIBYA

LIBYA WITH IRAN

4/94

Unconfirmed reports suggest that Iran and Libya are undertaking a joint venture, in Iran, to develop the German-designed 950 km range Al-Fateh missile project.

Anoushiravan Ehteshami, *International Defense Review*, 4/94, pp. 72-73 **(4181)**.

MALAYSIA

MALAYSIA WITH UNITED KINGDOM

2/94

The government of Malaysia signs a contract with British Aerospace Defence Ltd. for the purchase of Seawolf missiles, spare parts, and a depot test facility. The Seawolf missiles, along with the spare parts and depot test facility, will complete a Malaysian naval defense purchasing package that includes two 2,000-ton frigates procured from GEC-Marconi in 3/92. The Vertical Launch Seawolf package will give the Royal Malaysian Navy the most advanced rapid-reaction, close-area defense capability available.

Wendy Lambourne, *Pacific Research*, 2/94, p. 33 **(4111)**.

2/26/94

Malaysian Defence Minister Najib Tun Razak states that Malaysia is searching for new sources of weapons now that it has announced a ban on contracts, potentially worth billions of pounds, with British companies. Malaysia will, however, honor a 1988 agreement to purchase 4.6 billion ringgit ($1.6 billion) in arms from Britain. Razak also stated, "Whatever has been contractually committed will continue, that is, all those contracts under the MOU (1988 memorandum of understanding)." Under the agreement with Britain, Malaysia purchased two Yarrow missile frigates, a Martello Marconi 3-D radar system, and short-range anti-aircraft missiles. The first Malaysian "Buy British Last" policy came after London imposed fees for foreign students in 1981. The 1981 "Buy British Last" policy came to an end following the 1988 arms agreement between Britain and Malaysia. The current ban was brought on by British press accusations of Malaysian government corruption.

Bill Tarrant, Reuter, 2/26/94; in Executive News Service, 3/1/94 **(4110)**.

NORTH KOREA

INTERNAL DEVELOPMENTS

1/28/94

The South Korean daily *Hanguk Ilbo* reports that North Korea is believed "to possess 12 to 18 Nodong-1 missiles at present," and that the Nodong-2 is in the developmental stage.

Yi Sang-won, *Hanguk Ilbo* (Seoul), 1/28/94, p. 5; in JPRS-TND-94-005, 2/25/94, pp. 42-45 **(4179)**.

2/94

According to U.S. intelligence sources, U.S. intelligence satellites detect what appears to be two new "missile simulators" at the Sanum Dong research and development center.

Barbara Starr, *Jane's Defence Weekly*, 3/12/94, p. 1 **(4287)**.

3/17/94

CIA Director R. James Woolsey confirms that North Korea is developing two new ballistic missiles, the Taep'o-dong-1 and Taep'o-dong-2, which U.S. intelligence analysts estimate to have ranges of 1,240 and 2,170 miles respectively. Woolsey states, "These new missiles have yet to be flown, and we will monitor their development, including any attempts to export them in the future to countries such as Iran." Woolsey comments that the missiles may be capable of delivering nuclear, biological or chemical warheads and further states, "Unlike the missiles the North Koreans have already tested, these two [IRBMs] . . . could put at risk all of Northeast Asia, Southeast Asia and the Pacific area, and if exported to the Middle East, could threaten Europe as well." Although the Taep'o-dong-2 resembles the Chinese CSS-2, U.S. intelligence agencies disagree as to whether China shared technology with North Korea, an action that China denies.

R. Jeffrey Smith, *Washington Post*, 3/18/94, p. A24 **(4286)**. Bill Gertz, *Washington Times*, 3/19/94, p. A3 **(4286)**.

3/19/94

North Korean defector Ko Chon-song reports in an interview with the Japanese newspaper *Sankei Shimbun* that at 21:30 hours on 11/30/91, an explosion occurred at the Kanggye No. 26 General Plant, killing about 200 workers and destroying a number of homes. The Kanggye plant produced missiles, rocket bombs, the Hwasong-1 SAM, as well as a 200 km range air-to-air missile, among other weapons.

KBS-1 Radio Network (Seoul), 3/19/94; in FBIS-EAS-94-054, 3/21/94, p. 49 **(4241)**.

3/22/94

North Korean Army defector Sgt. Lee Chung-guk, who worked as a "calculator" at the "counter-nuclear and atomic analysis center" of the nuclear and chemical defense bureau of the Korean People's Army General Staff, states in a press conference that "missile bases located in Myongchon and Hwadae of North Hamgyong Province have Okinawa and Guam within shooting range." Lee also states that missiles based in Chagang Province are targeted at China, and that North Korea's Scud missiles can deliver chemical, but not nuclear warheads. Lee further states that North Korea has produced bio-chemical weapons developed by the Kim Il-sung University medical school and the People's Army Medical College that are so toxic, that they could kill or paralyze the entire 40 million person population of South Korea in the event of war.

Yonhap (Seoul), 3/22/94; in JPRS-TND-94-008, 4/1/94, P. 13 **(4291)**. *Washington Times*, 4/29/94, p. A15 **(4291)**.

4/94

A U.S. intelligence official, speaking on condition of anonymity, states that North Korea, due to its missile and nuclear developments, poses "the most urgent national security threat in East Asia." The official adds that if North Korea sells its Nodong missile armed with NBC warheads to Iran, "it would change the military balance in the Middle East." With the development of the Taep'o-dong-1 and -2 missiles, he comments, "North Korea would become a very major power in that [Northeast Asia] region," and if these missiles are sold to Iran, they "could have extraordinary influence throughout the Middle East and affect our allies."

Joseph Lovece, *Defense Week*, 4/25/94, p. 11 **(4288)**.

4/6/94

DPRK ambassador to India Cha Song-ju states, "Our nuclear arms, if developed, would be primarily designed to contain Japan." Cha indicates that the DPRK would not target South Korea or the mainland U.S. with nuclear missiles, and reiterates the DPRK position that it did not plan to build weapons of that kind.

Eugene Moosa, Reuter, 4/7/94 **(4164)**.

4/7/94

According to former White House and State Department official Stefan Halper, the U.S. Defense Intelligence Agency has indicated, "The North [Korea] may not be now capable of building a nuclear warhead for its Scuds, but it may be capable of making less complex chemical warheads." Halper also states that North Korea has a 1,200 mi-range missile slated for production, and a missile with a range of more than 5,000 mi, which could strike the U.S. West Coast, is in the "planning stage."

Stefan Halper, *Washington Times*, 4/7/94, p. A17 **(4231)**.

5/94

DPRK Deputy Permanent Representative to the U.N. Kim Jong-su, when asked if North Korea would continue to export weapons to states considered outlaw states by the U.S., such as Libya and Syria, says, " . . . if it fits our interests to continue nice relations with countries in Asia and other parts of the world, then we will do so." Kim further states that North Korea would not require missiles if the U.S. would withdraw from South Korea, and that he hopes his country will continue to improve and build new missiles.

Barbara Opall, *Defense News*, 5/9/94, p. 46 **(4230)**.

5/94

According to U.S. intelligence officials, North Korea does not possess missile transporters large enough to move fully assembled Taep'o-dong-1 or Taep'o-dong-2 missiles. The missiles do not have their

own transporter-erector-launchers and so require a fixed launch site, unlike North Korea's Scud and Nodong missiles. This may be an indication that the Taep'o-dongs are liquid-fuelled. North Korea is thought to possess two transporters capable of moving Taep'o-dong stages: the ND-1 transporter and a 17 x 2.7 m transporter. U.S. officials state that U.S. reconnaissance would most likely detect the movement of North Korean missiles to a fixed site before launch.

Jane's Defence Weekly, 5/7/94, p. 1 **(4273)**.

5/2/94

Yo Man Chol, a former security force captain who defected to South Korea, states that he had heard of "test firings of multiple-stage missiles in the northern area of Hamgyong."

Teresa Watanabe, *Los Angeles Times*, 5/3/94, p. A6 **(4291)**.

5/28/94

Several Japanese dailies report that the U.S. has provided the Japanese with satellite imagery of North Korean mobile-launcher trucks deployed near the DPRK coast and ships assuming positions off the coast, which seems to indicate that a test-launch of the North Korean Nodong-1 missile is imminent. According to an unidentified military source in Tokyo, the vehicles had been photographed by a U.S. intelligence satellite one week earlier.

Reuter, 5/28/94 **(4285)**. David E. Sanger, *New York Times*, 5/29/94, pp. 1, 6 **(4285)**.

5/31/94

According to Japanese government spokesman Hiroshi Kumagai, North Korea test-fires what is believed to be an upgraded version of the Chinese designed Silkworm anti-ship missile into the Sea of Japan.

Eugene Moosa, Reuter, 6/1/94 **(4289)**.

6/2/94

North Korea test-fires a second anti-ship missile into the Sea of Japan.

Reuter, 6/3/94; in NNN News, 6/3/94 **(4289)**.

6/6/94

In the first official acknowledgement of the 6/2/94 missile test, the North Korean deputy ambassador at the United Nations mission, Han Chang-on, confirms the testing of the anti-ship missile, stating, "This was just an exercise, normal, usual exercise . . . our (missiles) are simply, totally, completely defensive."

Reuter, 6/6/94 **(4289)**.

North Korea with Iran

2/94

The commander of the North Korean Air Force, General Cho Myong-rok, leads a 29-man team of military and nuclear experts to Iran, and, according to the Paris-based Arabic newspaper *Al-Watan Al-Arabi*, formed "new agreements to intensify military and nuclear cooperation." According to Arabic and Western diplomatic sources, the delegation most likely went to Iran in order to discuss testing of the Nodong-2 ballistic missile in Iran; some reports indicate that the Nodong-1 was the missile discussed.

Washington Times, 2/25/94 **(4296)**.

2/24/94

Iranian Revolutionary Guard Corps head Major General Mohsen Reza'i denies allegations in the Western press that Iran may have or will in the future provide North Korea with the necessary facilities to test 1,000 km range [Nodong-1] missiles. Reza'i states, "By now the entire world should know that Iran is very sensitive as far as our soil and military facilities are concerned and we will never allow others to use it . . . no matter how friendly 'others' [North Koreans] are."

Tehran Times (Tehran), 2/24/94, pp. 1, 14; in JPRS-TND-94-006, 3/16/94, pp. 52-53 **(4177)**.

4/94

North Korea has offered to co-produce the Nodong-1 missile with Iran and has aided Iranian efforts to develop the long-range Scud-C and other Scud-type missiles.

Anoushiravan Ehteshami, *International Defense Review*, 4/94, pp. 72-73 **(4181)**.

4/11/94

Jane's commentator Paul Beaver states on Japan's Fuji Television that Iran and the DPRK have agreed to build a production plant for the Nodong-1 missile in Iran. According to Beaver, the project is being secretly promoted under the codename "Ronda-68" [as translated].

KBS-1 Radio Network (Seoul), 4/11/94; in JPRS-TND-94-010, 5/5/94, p. 47 **(4225)**.

North Korea with Israel

3/94

Israeli diplomats meet with senior North Korean officials in Beijing in an effort to bring about an agreement that would prevent Iran from acquiring 1,000 km range Nodong missiles from North Korea. In return for halting Nodong shipments to Iran, Israel is hoping to raise $1 billion among U.S. Jewish businessmen for North Korean civilian projects. The secret talks are being held despite U.S. objections. Secret Israeli-North Korean talks began approximately two years ago.

IDF Radio (Tel Aviv), 3/22/94; in JPRS-TND-94-008, 4/1/94, p. 34 **(4009)**.

3/22/94

The Israeli Foreign Ministry denies that Israel and North Korea are still conducting secret talks over the North Korean sale of Nodong missiles to Iran.

IDF Radio (Tel Aviv), 3/22/94; in JPRS-TND-94-008, 4/1/94, p. 34 **(4009)**.

North Korea with Japan

2/12/94

Japanese Prime Minister Morihiro Hosokawa states that the DPRK has tested a missile with a range of 1,500 km, and that it is "another source of concern, great concern for us [Japan]."

Reuter, 2/12/94 **(4227)**.

2/22/94

Former Japanese Foreign Minister Michio Watanabe recommends that the Japanese government tighten inspections of luggage and cargo shipped to North Korea in order to prevent the smuggling of Japanese high technology. Watanabe makes this recommendation following the 1/94 police raids of Japanese "trading houses" and manufacturers of high-technology equipment accused of illegally shipping spectrum analyzers to North Korea. North Korea may be using spectrum analyzers to improve the accuracy of its Nodong missiles. Korean residents

are suspected of smuggling hidden equipment in their luggage on a ferry from the Japanese port of Niigata to North Korea.

UPI, 2/22/94, **(4014)**.

North Korea with PRC

3/17/94

A PRC Foreign Ministry spokesman in Beijing describes a report appearing in the *Wall Street Journal*, which claims that the PRC had given advanced missile technology to North Korea, as "totally groundless."

Xinhua (Beijing), 3/17/94 **(4165)**. Reuter, 3/17/94 **(4012)**.

North Korea with Russia

4/22/94

Komsomolskaya Pravda reports that North Korea has been attempting to recruit Russian "rocket engineers" to work in North Korea since 1990 and that more than 20 Russian scientists have gone by way of China to North Korea, where they earn monthly salaries of $3,000 to $4,000, and are living under assumed names. Other Russian scientists have chosen to remain in Russia and pass information to North Korea by computer mail.

Yonhap (Seoul), 4/23/94; in JPRS-TND-94-011, 5/16/94, pp. 51-52 **(4178)**.

5/23/94

A South Korean Foreign Ministry official states that the weapons systems were removed from the 12 Russian submarines purchased by North Korea. He states that the subs were purchased for scrap and that they are obsolete and of no military use; only one submarine has been delivered. The editor of *Jane's Fighting Ships, 1994-1995*, Richard Sharpe, writes that it is "possible that the missile tubes may be adaptable for other weapons," which could include ballistic missiles.

Michael West, *San Francisco Examiner*, 5/23/94, pp. A1, A9 **(4264)**. *Washington Times*, 5/24/94, p. A15 **(4264)**.

North Korea with Syria

4/94

It is reported that the commander of the Israeli Home Front Command, Major General Ze'ev Livne, stated that Syria is acquiring Scud missiles and launchers from North Korea.

Qol Yisra'el (Jerusalem), 4/27/94; in FBIS-NES-94-082, 4/28/94, p. 41 **(3991)**.

North Korea with United States

4/94

U.S. Assistant Secretary of Defense for International Security Policy Ashton Carter states that there is a danger that North Korea would export nuclear weapons, as it is already an exporter of missile technology. Carter emphasizes that North Korea may prefer an alternate means of nuclear weapons delivery to its missile program, adding that no reliable determination of the missiles' accuracy has been made and that lifting COCOM restrictions would not help in North Korean missile guidance development as the missile program is completely indigenous.

Aerospace Daily, 4/11/94, p. 55 **(4155)**.

NORWAY

Norway with United States

4/94

The Norwegian Army is finishing tests of the U.S.-designed Multiple Launch Rocket System (MLRS), and, if the army recommends it, an MLRS battalion may be purchased for the North Norway division. The South Norway division may also receive a MLRS battery.

Jane's Defence Weekly, 4/30/94, p. 5 **(4045)**.

PAKISTAN

Internal Developments

2/94

The Pakistani Hatf (Deadly) series of missiles is at an advanced stage of development. The ranges of the Hatf missiles vary between 60 and 600 km, carrying an average payload of 500 kg. The Hatf-2 and Hatf-3, two-staged solid-fuel missiles, pose the greatest threat, with ranges of 300 km and 600 km respectively. Various reports say that the Hatf-2 and -3 missiles are based on the Chinese M-9 and M-11 ballistic missiles, although published photographs do not support this claim.

Rahul Bedi, *Jane's Defence Weekly*, 2/19/94, p. 20 **(4104)**.

5/94

Former Pakistan army chief General Mirza Aslam Beg states that Pakistan may use Chinese M-11 missiles to deliver nuclear weapons, although Pakistan has denied receiving these missiles. According to Beg, the National Nuclear Command Authority, an organ previously unknown in the West, has control of Pakistan's nuclear button.

Pacific Research, 5/94, p. 34 **(4169)**.

Pakistan with India and the MTCR

5/94

According to a Pakistani Foreign Office spokesman, the major MTCR members, including the U.S., have been informed of Pakistan's concern over "the reported Indian decisions with regard to the deployment of Prithvi and the continued development of Agni." The spokesman also states that the Pakistani government hopes that the international community will persuade India to stop "its reckless move" of "enhancing the threat to peace and security in South Asia." Pakistan's most recent diplomatic attack against India's missile program could also be an attempt to divert international atten-

tion from claims made by the U.S. that Pakistan clandestinely acquired an M-11 missile or its parts from China, which resulted in U.S. sanctions against both countries. The Pakistani spokesman states that the major countries of the MTCR were informed of Pakistan's perception that if India continues with its missile program, it would "raise the specter of a nuclear arms race in South Asia."

Reuter, 5/11/94, **(4082)**. P.S. Suryanarayana, *Hindu*, 5/21/94, p. 4 **(4105)**.

PAKISTAN WITH PRC

2/94

Reports claim that China supplied M-9 and M-11 missiles directly to Pakistan. The range of the M-9 and M-11 missiles are 300 km and 600 km respectively.

Rahul Bedi, *Jane's Defence Weekly*, 2/19/94, p. 20 **(4104)**.

3/94

U.S. intelligence reports indicate that Pakistan is developing a new missile with Chinese help.

Michael R. Gordon, *New York Times*, 3/23/94, p. A5 **(4093)**.

3/23/94

Chinese Ambassador Li Daoyu refutes charges that China is a "key proliferator of destabilizing weapons and technology" to the Middle East, and said that China is not supplying M-11 ballistic missile technology to Pakistan or M-9 ballistic missile technology to Iran. Ambassador Li also stated that China is not supplying Iran with "chemical weapons precursors."

Security Affairs, 4/94, p. 3 **(4198)**.

PEOPLE'S REPUBLIC OF CHINA

INTERNAL DEVELOPMENTS

2/94

China introduces a prototype of its new Long March-3 multi-stage booster, which is capable of placing a 2.5-ton payload into a high earth orbit.

Mark Frankel, George Wehrfritz and Marcus Mabry, *Newsweek*, 5/2/94, pp. 44-45 **(4190)**.

2/8/94

China successfully launches two satellites from the Xichang Satellite Launch Center in Sichuan province on the maiden voyage of the latest version of the Long March 3-A rocket. China's Long March 3-A rocket is capable of carrying a 2.5 ton payload, which is 1.1 tons more than its predecessor, the Long March 3. The Long March-3A uses a new, high-energy, cryogenic liquid-oxygen/liquid-hydrogen third stage.

Washington Times, 2/11/94, p. A18 **(3888)**. *Space News*, 2/14/94, p. 2 **(4117)**. *Flight International*, 2/23/94, p. 26 **(4117)**.

2/17/94

The deputy director of the China National Space Administration's international office, He Shaoqing, says that the average annual budget for the civilian space program over the past few years was approximately 1.4 to 1.5 billion yuan ($168-$180 million). The figure "covers all research and development, rocket and satellite production and launch site tests." According to senior U.S. space managers, this is the first time China has disclosed funding totals for its civil space program.

Andrew Lawler, *Space News*, 2/28/94, pp. 3, 21 **(4192)**.

3/12/94

Chinese Finance Minister Liu Zhongli tells the National People's Congress (NPC) that the Chinese State Council has allocated 52.04 billion yuan (HK$46.2 billion) for national defense in 1994. According to a military source, "The PLA is pumping funds and resources into developing nuclear-powered submarines as well as medium-range missiles that could be launched by them.... The PLA is testing a submarine-launched missile that has a range of around 400 kilometers." According to Western military analysts, the PLA's Second Artillery Unit is developing medium to long-range ballistic missiles, such as the Dong Fang-25 (DF-25) and the Dong Fang-31 (DF-31). The DF-25 has a range of 1,700 km and the DF-31 has a range of 8,000 km. China is also working on a new generation of solid-fuel ICBMs.

Bill Gertz and Martin Sieff, *Washington Times*, 5/5/94, p. A12 **(4207)**.

4/94

According to Robert S. Norris, principal author of a book on nuclear weapons programs in China, Britain and France, China's arsenal probably consists of 300 strategic nuclear weapons on missiles launched from submarines, the ground, and air. Approximately 150 weapons remaining in the Chinese arsenal are "artillery shells and other battlefield nuclear weapons."

International Herald Tribune, 4/25/94 **(4186)**.

4/2/94

The explosion of a Chinese Feng Yun-2 satellite, to be launched by a Long March-3 booster at the Xichang launch center, seriously damages the satellite, the ground test equipment, and Spacecraft Test Hall No. 2. According to China Great Wall Industry Corp. (CGWIC), during the last checkout, when the satellite was already loaded with propellant, a fire broke out suddenly and there was an explosion. It is believed that the explosion was caused by the hydrazine on-board propellant system for geostationary orbiting and attitude control/station keeping.

Reuter, *Washington Times*, 4/26/94, p. A14 **(4206)**. Patrick E. Tyler, *New York Times*, 4/27/94, p. A3 **(4206)**. Andrew Lawler, *Space News*, 5/2/94, p. 3 **(4118)**. *Flight International*, 5/4/94, p. 20 **(4206)**.

5/93

A private arms exhibition in Beijing included an S-300 high-altitude missile air defense system among the anti-aircraft sys-

tems that were shown. Senior commanders of China's People's Liberation Army (PLA) "were impressed, but placed no orders."

Jane's Defence Weekly, 2/19/94, pp. 28-31 **(4116)**.

5/4/94

U.S. Senator Larry Pressler says that China is developing a new generation of nuclear missiles. Pressler states that some of the financing for the Chinese missile program comes from Chinese companies under military control and that some of the companies "generate cash doing business in the U.S." He adds that the Clinton administration believes that the Chinese nuclear test scheduled for 5/94 is part of the Chinese missile development program. According to Western military analysts, the Chinese People's Liberation Army (PLA) Second Artillery Unit is working on the development of medium and long-range ballistic missiles such as the Dong Fang-25 and Dong Fang-31, which have ranges of 1,700 km and 8,000 km respectively. The DF-31, which will carry a 100-kt warhead, could be deployed as early as 1996. The DF-41, which has a 7,440 mile range, will probably be deployed within the next ten years and will carry a 1-Mt warhead. China is also developing the JL-2, a submarine-launched version of the DF-31 with a 4,960 mile range.

Bill Gertz and Martin Sieff, *Washington Times*, 5/5/94, p. A12 **(4207)**.

PRC with Australia

2/18/94

The vice president of the China Aerospace Corporation Wang Liheng states that his company is close to finalizing an agreement with Optus Communications of Australia to launch the Optus-3 satellite on a Chinese Long March 3A rocket. China hopes to compete with the U.S. and Europe in the commercial space launch market by offering less expensive launches using its Long March rockets, a modified version of a Chinese ICBM.

Reuter, 2/18/94; in Executive News Service, 2/21/94 **(4188)**. Reuter, 2/22/94 **(4115)**.

PRC with Iran

3/23/94

Chinese Ambassador Li Daoyu refutes charges that China is a "key proliferator of destabilizing weapons and technology" to the Middle East, and said that China is not supplying M-11 ballistic missile technology to Pakistan or M-9 ballistic missile technology to Iran. Ambassador Li also stated that China is not supplying Iran with "chemical weapons precursors."

Security Affairs, 4/94, p. 3 **(4198)**.

4/94

China has helped Iran establish a Scud-B missile production line and assisted in the development of the Oghab (Eagle) rocket system.

Anoushiravan Ehteshami, *International Defense Review*, 4/94, pp. 72-73 **(4181)**

PRC with North Korea

3/17/94

A PRC Foreign Ministry spokesman in Beijing describes a report appearing in the *Wall Street Journal*, which claims that the PRC had given advanced missile technology to North Korea, as "totally groundless."

Xinhua (Beijing), 3/17/94 **(4165)**. Reuter, 3/17/94 **(4012)**.

PRC with Pakistan

2/94

Reports claim that China supplied M-9 and M-11 missiles directly to Pakistan. The range of the M-9 and M-11 missiles are 300 km and 600 km respectively.

Rahul Bedi, *Jane's Defence Weekly*, 2/19/94, p. 20 **(4104)**.

3/94

U.S. intelligence reports indicate that Pakistan is developing a new missile with Chinese help.

Michael R. Gordon, *New York Times*, 3/23/94, p. A5 **(4093)**.

3/23/94

Chinese Ambassador Li Daoyu refutes charges that China is a "key proliferator of destabilizing weapons and technology" to the Middle East, and said that China is not supplying M-11 ballistic missile technology to Pakistan or M-9 ballistic missile technology to Iran. Ambassador Li also stated that China is not supplying Iran with "chemical weapons precursors."

Security Affairs, 4/94, p. 3 **(4198)**.

PRC with Russia

1/94

According to a U.S. Library of Congress report, since 1990 China has received up to 100 S-300 SAMs from Russia.

Aviation Week & Space Technology, 2/28/94, pp. 24-25 **(4185)**.

2/94

According to Russian sources, 300-400 Chinese scientists and technicians are working at Russian aerospace institutes in Moscow, Tyazan, Samarand, and Saratov. According to diplomats in Beijing, over 1,000 Russian scientists and engineers (300 according to Russian sources) are working in China, many under the auspices of the Aeronautics Ministry. China is interested in air-to-air missiles, navigational systems, and radar technology.

Jane's Defence Weekly, 2/19/94, pp. 28-31 **(4116)**.

4/94

A Chinese industry official states that during a visit to Moscow a Chinese delegation was shown a number of Russian air defense systems that are available for export. According to the official, the delegation wanted to determine the suitability of Russian air defense systems for integration into China's air defense network. High-level Chinese military officials are reportedly negotiating for the purchase of 150 km range S-300P high-altitude SAM systems, which are produced by the Almaz Design Bureau. China reportedly already has the S-300P in its inventory, having acquired them in 1993.

David Boey, *Defense News*, 4/18/94, p. 29 **(4266)**.

PRC with Taiwan

2/18/94

China announces that a delegation of over 100 aerospace officials will go to Taiwan in 3/94 to further space industry cooperation. Vice President of China Aerospace Corporation Wang Liheng states that while the two countries have no formal contacts, they "have many friendly contacts," but so far there are no plans for joint projects.

Reuter, 2/18/94; in Executive News Service, 2/21/94 **(4204)**.

PRC with United States

1/25/94

Liu Jiyuan, president of the China Aerospace Corp., and administrator of the China National Space Administration, states that U.S. sanctions imposed on China in 8/93 for the alleged sale of missile parts to Pakistan in 11/92 are hurting China's space program. According to Liu, the U.S. sanctions have caused delays in the development of the Dong Fang Hong-3 (DFH-3) and loss of launch sales, and have damaged the reputation of Chinese space organizations.

Andrew Lawler, *Space News*, 2/14/94, pp. 1, 25 **(4200)**.

1/26/94

The U.S. and China began two days of talks on nonproliferation issues such as missile transfers and a comprehensive nuclear test ban. According to senior U.S. officials, an effort will be made to reach an agreement which will allow the U.S. to lift its sanctions on the sale of U.S. satellites to China.

Carol Giacomo, Reuter, 1/26/94 **(4189)**.

2/94

James R. Lilley, U.S. Assistant Secretary of Defense for International Security in the Bush Administration and an expert on China, says that China is attempting to acquire submarine-launched ballistic missile technology, muffled submarine propulsion, and a more efficient air-refuelling system. Lilley also says that China is attempting to refine the "trajectories" of its cruise missiles.

Aviation Week & Space Technology, 2/28/94, pp. 24-25 **(4185)**.

3/7/94

U.S. Secretary of State Warren Christopher announces that Hughes will remove a decryption chip from the Optus B3 satellite, clearing the way for satellite launches, valued at about $1 billion, by China's Long March rocket over the next two years. Christopher states that the decision to proceed with the launch "was consistent with our law and served our commercial purposes." The launch had originally been held up by the State Department on the grounds that it involved sensitive technology controlled by MTCR guidelines. The launch is made possible as an incentive to get the Chinese to sign the MTCR.

Jim Mann, *Los Angeles Times*, pp. D1, D7 **(4197)**. Michael Mecham and Michael A. Dornheim, *Aviation Week & Space Technology*, 3/14/94, p. 35 **(4196)**. *Arms Control Today*, 4/94, p. 28 **(4125)**.

3/11/94-3/14/94

The State Department visit to China fails to break the impasse in the negotiations to get China to sign the MTCR. The U.S. will lift the sanctions on China, which were imposed on 8/25/93 for selling M-11 missiles to Pakistan, if China formally signs the MTCR and "comes to an understanding" concerning future Chinese missile and missile technology transfers to Pakistan. China wants the U.S. to remove its sanctions before it will sign the MTCR. China says that it already abides by the MTCR. In a subsequent statement, U.S. Undersecretary of State for International Security Lynn Davis states that the U.S. is closely watching China and is willing to impose stricter sanctions if China "steps out of line."

Inside The Pentagon, 3/24/94, pp. 9-10 **(4129)**. *Defense Daily*, 3/23/94, p. 436 **(4129)**. *Arms Control Today*, 4/94, p. 28 **(4125)**.

RUSSIA

Internal Developments

8/93

Russian Air Defense Troops command authorities and the general and chief designers from a number of design bureaus demonstrate the combat capabilities and effectiveness of a number of air defense systems, including the mobile S-300PMU1 designed by the "Almaz" Scientific Production Association. The demonstration is held at the Kapustin Yar testing range. The S-300PMU1 is capable of defending against six targets, including aircraft, cruise and ballistic missiles, and other "offensive air weapons systems," by firing two missiles at each target up to a range of 150 km and at a maximum altitude of 10 m. The S-300PMU1 can hit ballistic missiles up to a range of 40 km. The S-300PMU1 comprises a multi-function target illumination and guidance radar, eight launchers carrying four missiles each, and a command and control facility; the system is mounted on an off-road chassis. The missiles fired by the S-300PMU1 are manufactured by the "Fakel" Machine Building KB. The deployment time of the S-300PMU1 is five minutes and the system can operate autonomously or under the control of a command post. The system's vertical launch capability allows it to strike incoming targets from any direction.

Colonel Valentin Valentinov, Vestnik Protivovozdushnoy Oborony (Moscow), 12/93, pp. 12-14; in JPRS-UMA-94-013, 4/13/94, pp. 18-20 **(4004)**. Igor Krondo, Russian Television Network (Moscow), 2/25/94; in FBIS-SOV-94-046, 3/9/94, p. 18 **(4004)**.

12/8/93

Russian engineer Lev Volkov, in an interview with *Izvestiya*, states that Russia's future land-based strategic missile forces would consist of the SS-25 'Poplar' (RS-12M), an updated, 45 ton, mobile ICBM with a single one ton warhead. Volkov, a co-author of the new ten-year Strategic Weapons Program, states that by 2005, Russia's strategic missile arsenal will be entirely composed of SS-25s. The SS-25 can be launched from silos and mobile launchers. According to Volkov, Russia's future nuclear missile force will most likely consist of 900 launchers for ICBMs, although arms reduction agreements allow Russia to have 1,300 launchers.

UPI, 2/8/94 **(3997)**. *Flight International*, 2/16/94, p. 21 **(3997)**.

2/1/94

Russian officials announce that an abandoned train full of missiles meant for dismantlement had been discovered in the Siberian town of Kurgan. The missiles had neither fuel nor warheads. The railway car, "lost due to the negligence of railway staff," was placed under guard and sent to a plant on 2/1/94 so that the missiles could be dismantled.

Reuter, 2/1/94; in Executive News Service, 2/4/94 **(4097)**.

3/94

The Russian newspaper *Volna*, published in the Arkhangelsk Oblast, reports that in 1993 ICBMs converted for use as SLVs were regularly launched into space from the Plesetsk cosmodrome. The new "Start I" booster launched an experimental electronic mail satellite into orbit. In 1993, out of 36 space launches from the Plesetsk cosmodrome, 8 were for the Russian Defense Ministry.

Rossiyskiye Vesti (Moscow), 3/17/94, p. 11; in FBIS-SOV-94-053, 3/18/94, p. 22 **(4000)**.

3/94

According to Russian President Yeltsin's press service, Yeltsin signed an order directing the Ministry of Defense to establish measures, before 5/30/94, for the organization of the daily activities of the Strategic Rocket Forces now that their strategic missiles are to be "de-targeted." Yeltsin's order will implement the Moscow declaration he signed with U.S. President Bill Clinton on 1/14/94, and the joint statement he signed with the British Prime Minister on 2/15/94.

Itar-Tass World Service (Moscow), 3/12/94; in JPRS-TND-94-007, 3/23/94, p. 11 **(4007)**.

3/94

The commander of Russia's military space forces, Colonel-General Vladimir Ivanov, states that Russia will complete the conversion of an abandoned ICBM site in the Russian Far East into a commercial space launch facility in 1996, when a Rokot light booster will be launched. Russia's Angara-24 booster will be launched from the converted site in the year 2000. Up to five missile silos will be modified for launching Rokot boosters and two launch pads will be built for launching heavier boosters. The head of the General Machine-Building Design Bureau, Alexei Krysanov, states that a feasibility report concerning the ICBM site will be ready by the end of 1994.

Defense Daily, 3/31/94, p. 6 **(4130)**.

4/94

Officials from the Savernoye Project Design Bureau state that the 21st Russian Sovremenny class destroyer will include provisions for 24 new vertical-launch anti-ship missiles, likely to enter service after the turn of the century. They will replace the SS-N-22 'Sunburn' anti-ship missile. The new missile is thought to be smaller than the Sunburn, possibly similar to the SS-N-25, because a greater number are to be carried on the destroyers.

Charles Bickers, *Jane's Defence Weekly*, 4/16/94, p. 21 **(4284)**.

4/7/94

Itar-Tass announces that the Russian Federal Counter-intelligence Service arrested sixteen soldiers from a strategic nuclear missile unit located near Kopeisk, which is east of Chelyabinsk, for buying an unspecified narcotic.

UPI, 4/7/94; in Executive News Service, 4/7/94 **(4101)**.

5/94

Russian reports indicate that the Russian Air Force tested what may have been the Vympel R-37 long-range air-to-air missile. The R-37 was fired from a MiG-31 and intercepted a target. Russian television showed a MiG-31M, at the Russian Air Force Ahktubinsk test center, with four Vympel R-37's partially recessed into the fuselage of the aircraft. The fin configurations of each of the R-37's were slightly different. The four rear fins of the R-37 fold, which could indicate that the missile is meant to be carried internally. The R-37 is regarded as the primary air-to-air missile for the MiG-31M.

Flight International, 5/25/94, p. 14 **(3995)**.

5/94

General designer Mikhail Simonov states that Russia's first production model of the Su-24 fighter-bomber will be capable of carrying the Kh-29 and Kh-31 A/P air-to-surface missiles. The Russian Su-34 may also be able to carry the new, "very long-range" Raduga ASM-MSS anti-ship missile, which is still under development, the X58E anti-radar missile, or other weapons.

Interavia, 5/94, p. 52 **(4003)**.

5/94

It was reported that Russia's Plamya Ramjet Design Bureau and missile designer Novator are cooperating to convert the obsolete 3M8 (SA-4 Ganef) into a low-altitude supersonic target. Plamya increased the missile's low-altitude range, while Novator developed a new guidance system for the converted SA-4. Although the Russian bureau has not yet received any orders for the system, Plamya states that it would like to export the system.

Flight International, 5/25/94, p. 16 **(4001)**.

5/94

It is reported that Russia's Plamya ramjet design bureau displayed a supersonic ramjet engine for use on the experimental "Yakhont" (Jewel) anti-ship missile at the Moscow Aeroengine show. The status of the Yakhont is unclear, although Plamya states that the project is in the flight testing stage and has suffered from "financial problems."

Flight International, 5/25/94, p. 16 **(4001)**.

5/94

The Russian Chief of Staff of the state range of strategic rocket forces in the Arkhangelsk region, General Nikolay Yudin, is reported as stating that Russia has completed a "unique system of control for missile flights" at the range command post in Mirny. According to Yudin, the site, the only one of its kind in Russia, has been responsible since 1992 for monitoring Russian and U.S. fulfillment of treaty obligations that require both parties to share telemetric information on missile launches. The Russian Strategic Forces can now use the site for testing all types of missiles and for processing and analyzing information in accordance with strategic arms treaties. General Yuriy Zhuravlev is the chief of the new range.

Anatoliy Yurkin, Itar-Tass (Moscow), 4/13/94; in JPRS-TND-94-010, 5/5/94, p. 34 **(3996)**.

5/94

It is reported that the U.S. believes that the Novator Design Bureau's Alfa cruise missile could be operational in the Russian military within the next three or four years. According to Novator, a Russian firm, the sea-skimming cruise missile, capable of Mach 3 speeds, can be launched from surface ships, aircraft, ground systems, or submarines. Two new supersonic anti-ship missiles, the Yakhont and Alfa (a different system than Novator's) have been advertised by the Russian Scientific Production Association Mashinostroeniya. The Raduga Design Bureau is offering the new 85-RU anti-submarine and anti-ship missile, and the 3M80 supersonic sea-skimming anti-ship missile. The Zvezda Design Bureau offers the Kh-35 subsonic anti-ship missile in shipborne, air-launched, and coastal defense configurations, as well as the Kh-31 missile with anti-ship and anti-radar variants.

Barbara Starr, *Jane's Defence Weekly*, 5/21/94, p. 3 **(4006)**.

5/94

It is reported that Gerbert A. Yefremov, head of the Scientific Production Machine-Building Association (Mashinostroyeniya), which built Russian cruise missiles and ICBMs during the Cold War, is reorganizing the association in an attempt to enter the markets for earth-imaging satellites, solar-powered cells, food preservation equipment, and other commercial products.

Richard W. Stevenson, *Washington Times*, 5/2/94, pp. C1, C3 **(4263)**.

Russia with Brazil

5/94

Russia is to provide technical support and components for the final development of the Veiculo Lancador de Satelites (VLS), Brazil's four-stage, solid-fuel SLV. The first launch of the VLS is to be in late 1995 from Brazil's Alcantara site.

Flight International, 5/4/94, p. 20 **(4080)**.

Russia with Egypt

5/94

In an effort to modernize Egypt's armed forces without purchasing new equipment, the Egyptian military leadership has decided to upgrade its arsenal of Soviet-made SA-2, SA-3, and SA-6 air defense missiles that were acquired prior to the 1973 Arab-Israeli war.

Philip Finnegan, *Defense News*, 5/9/94, pp. 8, 16 **(4019)**.

Russia with Hungary

2/28/94

Russia and Hungary are expected to discuss a Russian offer, first made in 1993, in which Hungary could receive SA-10 'Grumble' S-300 SAMs as repayment for the former Soviet Union's $900 million remaining debt to Hungary.

Ryan Tutak, *Jane's Defence Weekly*, 2/5/94, p. 11 **(4270)**.

Russia with India

9/93

The original deal to transfer two Russian cryogenic rocket engines and technology for indigenous production to India is canceled after the U.S. threatens to impose sanctions against Russia. [However, the two engines and a portion of the technology were delivered before the cancellation goes into effect.] The U.S. considers the deal a violation of the MTCR, as it is feared that the engines will be used to power ballistic missiles, though both India and Russia insist they will be used for space exploration.

Reuter, 3/30/94; in Executive News Service, 3/30/94 **(4018)**.

1/94

The Indian media reports that Russia has agreed to transfer seven cryogenic rocket engines to make up for the canceled cryogenic rocket technology deal. However, Glavkosmos officials have not confirmed that the deal has gone through, stating that they did not know whether the Russian government had approved it.

Reuter, 3/30/94; in Executive News Service, 3/30/94 **(4018)**.

2/94

It is reported that the head of Russia's Glavkosmos, Yuri Koptev, acknowledges that Russia will sell India as many as seven cryogenic boosters as compensation for technical aid Russia "was forced to cancel." India will also receive equipment for the "testing and exploitation" of the engines. The new contract, renegotiated in 12/93, is awaiting approval by both Russia and India. The new contract includes four ready-to-fly engines and two "mock-up" versions for the previously agreed $80 million; ISRO will have the option to buy these additional engines for $3 million each. Russia will deliver the three additional engines to India in 1996 after the main contract has been fulfilled.

Vladimir Radyuhin, *Hindu* (Madras), 1/6/94, p. 1; JPRS-TND-94-005, 2/25/94, p. 54 **(3999)**. Reuter, 3/30/94; in Executive News Service, 3/30/94 **(4018)**. *Hindu*, 4/9/94, p. 12 **(4058)**.

3/22/94

Negotiations conclude on the deal to supply India with Russian cryogenic rocket engines.

Radio Rossii Network (Moscow), 3/25/94; in JPRS-TND-94-008, 4/1/94, p. 53 **(4018)**.

3/30/94

The outgoing head of the Indian Space Research Organization (ISRO), U.R. Rao, says that a new agreement has been signed with Glavkosmos chief Alexander Dunayev for the purchase of rocket engines. The first of the engines is to be transferred to India in 1996, with the remainder delivered over a three-year period. Rao says that the engines will be used to launch Indian satellites by 1996.

Reuter, 3/30/94; in Executive News Service, 3/30/94 **(4018)**. *Hindu*, 4/9/94, p. 12 **(4058)**.

5/11/94

According to Indian defense analyst Durga Prased Singh, India now has the expertise to maintain their Russian-built air defense missiles "and the Russians want India to extend their expertise to the other Asian nations which have these missiles." Reports indicate that during Indian Prime Minister Narasimha Rao's upcoming visit to Moscow in 6/94, India and Russia are expected to agree on broad weapon co-production

agreements. Specifically the agreements will cover Indian assembly and maintenance of Russian anti-aircraft missiles and Kilo-class submarines.

Defense News, 5/16/94, p. 2 **(4112)**.

Russia with Iraq

2/94

The former Soviet military attache to Baghdad, Colonel Viktor Patzalyuk, who has a close relationship with the Iraqi general staff, states that Russia obtained an undamaged engine from an unexploded U.S. cruise missile that was launched during the Gulf War.

Viktor Patzalyuk, *Jane's Defence Weekly*, 2/19/94, pp. 24-25 **(4102)**.

Russia with Kazakhstan

2/94

Russia moves 40 Tu-95-MS bombers armed with nuclear cruise missiles from Kazakhstan to Russia.

Reuter, 4/6/94 **(4098)**.

Russia with Kuwait

2/94

It is reported that Russia recently sold Kuwait five S-300 missile systems after the two countries conducted joint naval exercises in the Persian Gulf. Kuwait's interest in Russian equipment marks a dramatic shift in its post-Gulf War policy of establishing an entirely Western-equipped military.

Jury Sigov, *Washington Times*, 2/22/94, p. A13 **(3949)**. Philip Finnegan, *Defense News*, 4/25/94, pp. 1, 37 **(4040)**.

4/94

Kuwait and Russia are holding discussions on the purchase of BM-30 Smerch rocket systems, 2S6 surface-to-air missiles, air defense radars, and additional equipment. Kuwait is likely to negotiate a debt reduction plan with Russia, as it did prior to the Gulf War when it obtained Soviet SA-11 surface-to-air missiles.

Francis Tusa, *Armed Forces Journal*, 4/94, p. 14 **(4038)**.

4/94

According to Washington diplomatic sources, the Kuwaiti military plans to buy 27 Russian 300 mm multiple-launch rocket systems.

Philip Finnegan, *Defense News*, 4/25/94, pp. 1, 37 **(4040)**.

Russia with North Korea

4/22/94

Komsomolskaya Pravda reports that North Korea has been attempting to recruit Russian "rocket engineers" to work in North Korea since 1990 and that more than 20 Russian scientists have gone by way of China to North Korea, where they earn monthly salaries of $3,000 to $4,000, and are living under assumed names. Other Russian scientists have chosen to remain in Russia and pass information to North Korea by computer mail.

Yonhap (Seoul), 4/23/94; in JPRS-TND-94-011, 5/16/94, pp. 51-52 **(4178)**.

5/23/94

A South Korean Foreign Ministry official states that the weapons systems were removed from the 12 Russian submarines purchased by North Korea. He states that the subs were purchased for scrap and that they are obsolete and of no military use; only one submarine has been delivered. The editor of *Jane's Fighting Ships, 1994-1995*, Richard Sharpe, writes that it is "possible that the missile tubes may be adaptable for other weapons," which could include ballistic missiles.

Michael West, *San Francisco Examiner*, 5/23/94, pp. A1, A9 **(4264)**. *Washington Times*, 5/24/94, p. A15 **(4264)**.

Russia with PRC

1/94

According to a U.S. Library of Congress report, since 1990 China has received up to 100 S-300 SAMs from Russia.

Aviation Week & Space Technology, 2/28/94, pp. 24-25 **(4185)**.

2/94

According to Russian sources, 300-400 Chinese scientists and technicians are working at Russian aerospace institutes in Moscow, Tyazan, Samarand, and Saratov. According to diplomats in Beijing, over 1,000 Russian scientists and engineers (300 according to Russian sources) are working in China, many under the auspices of the Aeronautics Ministry. China is interested in air-to-air missiles, navigational systems, and radar technology.

Jane's Defence Weekly, 2/19/94, pp. 28-31 **(4116)**.

4/94

A Chinese industry official states that during a visit to Moscow a Chinese delegation was shown a number of Russian air defense systems that are available for export. According to the official, the delegation wanted to determine the suitability of Russian air defense systems for integration into China's air defense network. High-level Chinese military officials are reportedly negotiating for the purchase of 150 km range S-300P high-altitude SAM systems, which are produced by the Almaz Design Bureau. China reportedly already has the S-300P in its inventory, having acquired them in 1993.

David Boey, *Defense News*, 4/18/94, p. 29 **(4266)**.

Russia with South Africa

2/24/94

South Africa is finalizing a contract with the Russian STC Complex for the launch of its Greensat satellite aboard the START-1, a converted Russian SS-25 ICBM. The Chief Manager of the STC Complex in Moscow, Yuri Arzumanyan, states, "There is the problem of missile technology proliferation, so we cannot go to South Africa and launch from their territory right now."

Ben Iannotta, *Space News*, 2/28/94, p. 8 **(4073)**.

Russia with Syria

4/27/94

During Israeli Prime Minister Yitzhak Rabin's visit to Moscow, Russian Deputy Foreign Minister Boris Kolokov states that Russia will not sell Syria offensive weapons. However, Russia would sell defensive weapons and the spare parts for equipment Syria already has. Western and Israeli

sources say that Syria would like to purchase SA-10 'Grumble' air defense systems from Russia.

James Bruce, *Jane's Defence Weekly*, 5/14/94, p. 3 **(4100)**.

5/94

Israeli sources report that Russia and Syria are negotiating an arms deal that would involve the sale of SA-10 (S-300V) Grumble surface-to-air missiles as well as Su-27, Su-24, and MiG-29 fighters. This latest deal with Russia was made possible by an agreement in which much of Syria's $7 billion debt, accumulated from previous weapons sales, will be deferred pending the immediate transfer of $2 billion.

Flight International, 4/20/94, p. 16 **(3988)**. *Flight International*, 5/18/94, p. 17 **(3988)**.

5/94

The newspaper *Al-Hayat* states that Russia agreed to write off most of Syria's debt on the condition that Syria agrees to pay cash for its future purchases. Russia is thought to have written off 80% to 90% of Syria's $10 billion military debt. There are also indications that Russia and Syria have agreed upon an additional transfer of $500 million of equipment.

James Bruce, *Jane's Defence Weekly*, 5/14/94, p. 3 **(4100)**.

Russia with Turkey

4/94

According to Turkish National Defense Minister Mehmet Golhan, Turkey will purchase long-range missiles from the Russian Federation in a cooperative move that will also provide Turkey with ballistic missile technology. Golhan states that Turkey made the move to procure missiles in response to Iranian and Syrian missiles. According to Golhan, Turkey and Russia have completed a framework agreement that will provide for technical cooperation on matters related to missile technology.

Ugur Sefkat, *Sabah* (Istanbul), 4/29/94, p. 12; in JPRS-TND-94-011, 5/16/94, p. 40 **(4243)**.

Russia with Ukraine

2/94

Russian officials confirm that Russia no longer controls missile troops stationed in Ukraine as the commanders of the 43rd and 46th missile divisions have pledged loyalty to the government in Kiev.

Interfax (Russia); in Russia/CIS Intelligence Report, 2/22/94 **(4251)**.

Russia with United Kingdom

3/1/94

According to a statement released by Alexander Mikhailov of Russia's counter-espionage service, a senior official in the Russian weapons industry confessed to being a spy for Great Britain's MI6. The "spy," a Russian citizen, was arrested on 1/15/94, and was charged with treason on 1/25/94. According to Mikhailov, the British spy was given "special communication equipment" to contact the British embassy in Moscow, and was paid for technical information on Russia's missile systems and the financing of defense research.

Intelligence Newsletter, 3/10/94, pp. 6-7 **(4008)**.

Russia with United States

3/14/94

U.S. Secretary of State Warren Christopher and Russian Foreign Minister Andrey Kozyrev agree that Russian experts will participate in drafting a new COCOM. A high-ranking diplomat close to Kozyrev states that Russian participation in the drafting of a new COCOM is an important aspect of U.S.-Russian cooperation on the nonproliferation of missiles and other "dangerous know-how."

Interfax (Moscow), 3/15/94; in FBIS-SOV-94-051, 3/16/94, p. 9 **(4002)**.

5/6/94

U.S. sanctions imposed on India and Russia following their original cryogenic engine deal expire.

Defense News, 5/2/94, p. 2 **(4020)**.

SAUDI ARABIA

Saudi Arabia with France

2/1/94

France and Saudi Arabia sign several contracts worth a total of FFr9 billion ($1.53 billion) to modernize a variety of surface-to-air missiles, two tanker supply ships, and four frigates. Thomson-CSF, Matra, Giat, DCN, and other French contractors will be responsible for the modernization of Saudi equipment. A new contract for FFr6 billion is expected to be negotiated with Thomson-CSF for 1,000 man-years of technical assistance, spare parts, and replacements for Crotale (renamed Shahine by the Saudis) SAMs.

Pierre Tran, Reuter, 2/1/94; in Executive New Service, 2/4/94 **(3985)**. David Buchan, *Financial Times*, 2/2/94, p. 5 **(3985)**.

SERBIA

Serbia with Bosnia-Herzegovina

3/11/94

Twelve people are killed and another 32 wounded when what are believed to be Russian-made Luna missiles [FROG rockets] launched by Serbian forces destroy eight apartment buildings in Mglaj, Bosnia-Herzegovina.

Srecko Latal, *Washington Times*, 3/12/94, p. A9 **(4275)**.

SINGAPORE

SINGAPORE WITH ITALY

3/94

The Singapore Navy is considering proposals by the Italian company, Simmel Difesa, for a naval version of the Firos-30 ground-launched rocket system. Simmel Difesa and Breda, another Italian company, co-developed a stabilized naval launch platform using Breda's 105 mm SCALR multi-purpose rocket launcher. The stabilized platform can house one or two modules, each of which consists of 20 tubes that launch Firos-30 122 mm rockets with a range of 34 km. Simmel Difesa developed the Firos 30 rocket for the U.K.'s Royal Ordinance.

Jane's Defence Weekly, 3/5/94, p. 11 **(4034)**.

SOMALIA

INTERNAL DEVELOPMENTS

4/94

It is reported that military installations in Somaliland, which has declared itself independent from Somalia, contain several tons of former Soviet equipment in dangerous condition, including SSC-3 'Styx' coastal defense missiles.

Tira Shubart, *Jane's Defence Weekly*, 4/16/94, p. 31 **(4075)**.

SOUTH AFRICA

INTERNAL DEVELOPMENTS

1/94

The South African Navy plans to build two new classes of ships: a four ship series of corvettes under 2,000 tons and a six ship series of smaller coastal patrol vessels. Both classes are to be armed with Skorpioen (Gabriel II) anti-ship missiles.

Richard Scott, *Defence Systems Modernisation*, 1/94, p. 25 **(4249)**.

Late 3/94

South African nuclear and rocket scientists threaten to expose secrets about South Africa's arms industry unless they were paid 4.5 million Rand as compensation for being laid off by Advena, a subsidiary of Denel, on 4/15/93. A spokesman, claiming to represent 16 scientists, says that their disclosures would "prove embarrassing for Armscor [Armaments Corporation of South Africa] and Denel [an offshoot of Armscor], and the National Government."

Sunday Times (Johannesburg), 3/27/94, pp. 1-2; in JPRS-TND-94-008, 4/1/94, pp. 1-2 **(4074)**.

Late 3/94

The South African Transvaal Supreme Court issues an order preventing 16 scientists from disclosing information to the media or unauthorized personnel regarding the "obtaining, marketing, importing, exporting, development, manufacture, maintenance or repair of armaments by Armscor or its subsidiaries." The decision follows a suit by Armscor claiming that disclosure of the information might harm South Africa's chances of admission to the MTCR.

Sunday Times (Johannesburg), 3/27/94, pp. 1-2; in JPRS-TND-94-008, 4/1/94, pp. 1-2 **(4074)**.
Stephanie Bothma, *Business Day* (Johannesburg), 3/30/94, pp. 1-2; in JPRS-TND-94-008, 4/1/94, p. 3 **(4074)**.

SOUTH AFRICA WITH ISRAEL

2/94

It is reported that South Africa developed a version of the Israeli Jericho missile with extensive Israeli help. The South African version of the Jericho was jointly tested by Israel and South Africa in 7/89 at the Overberg test range in South Africa. U.S. officials say that one of the "several" missiles that Israel was helping South Africa to develop was intended to carry a nuclear payload.

Paul Stober and Jane Hunter, *Weekly Mail & Guardian* (Johannesburg), 2/18/94, p. 6; in JPRS-TND-94-006, 3/16/94, pp. 55-56 **(4053)**.

3/94

A South African spokesman for 16 nuclear and missile scientists states that Israel had supplied South Africa with rocket technology as well as details on how to convert a space launch vehicle into a nuclear ballistic missile. According to the spokesman, the South African space program originally intended to use a "clone" of the Israeli two-stage solid-fuel Jericho-2 missile as a delivery system for nuclear weapons. In 1988 and 1989, two mobile launchers were built and tested at the Armscor test site at Advena, but were never used. The missile, code named RSA3, only underwent static testing. According to the spokesman more than 200 South Africans secretly visited Israel and worked on the missile program from 1989 to 1992. Israel also sold technology to South Africa that would make its missiles accurate to within one kilometer by using a system of explosives that could separate the warhead from the missile at designated point in the flight path for targeting purposes.

Sunday Times (Johannesburg), 3/27/94, pp. 1-2; in JPRS-TND-94-008, 4/1/94, pp. 1-2 **(4074)**.

SOUTH AFRICA WITH RUSSIA

2/24/94

South Africa is finalizing a contract with the Russian STC Complex for the launch of its Greensat satellite aboard the START-1, a converted Russian SS-25 ICBM. The Chief Manager of the STC Complex in

Moscow, Yuri Arzumanyan, states, "There is the problem of missile technology proliferation, so we cannot go to South Africa and launch from their territory right now."

Ben Iannotta, *Space News*, 2/28/94, p. 8 **(4073)**.

South Africa with United States

2/24/94

A U.S. State Department official says that the proposed launch of a South African remote-sensing satellite on a converted Russian SS-25 ICBM poses fewer proliferation concerns because the launch will not take place in South Africa. If the launch were to take place in South Africa, there would be greater concern that Russian technology could be diverted to South African offensive military programs.

Ben Iannotta, *Space News*, 2/28/94, p. 8 **(4073)**.

SOUTH KOREA

South Korea with United States

3/21/94

U.S. President Clinton announces the deployment of a battery of Patriot missiles, including 850 soldiers, to South Korea, stating, "We have agreed that it is in our national interests and in the interest of the people of South Korea and the security of our armed forces there to proceed with the Patriot deployment. So we will do that." President Clinton added, "I want to emphasize that this decision on the Patriots is purely defensive in nature." The Patriots are to be stationed around U.S. bases near Seoul and other key sites.

R. Jeffrey Smith and Ann Devroy, *Washington Post*, 3/22/94, pp. A1, A12 **(4232)**. Barry James, *International Herald Tribune*, 3/22/94 **(4239)**.

3/23/94

South Korean defense Minister Yi Pyong-tae comments on the five-stage ROK-U.S. Combined Operations Plan (OP 5027) strategic concept, the second-stage of which foresees the combined forces of South Korea and the U.S. intercepting concentrated Scud, Nodong-1, and Nodong-2 missile attacks on Seoul with Patriot missiles. According to the operations plan, North Korea has approximately 2,400 multiple-warhead missiles within 100 km of the DMZ. This arsenal includes Scud, Nodong-1 and Nodong-2 SSMs. The Taep'o-dong-1 and -2 missiles are believed to be in development and it is unclear if operational missiles of this kind are available for deployment now.

Kim Chun-pom, *Chungang Ilbo* (Seoul), 3/24/94, p. 2; in JPRS-TND-94-008, 4/1/94, pp. 7-8 **(4171)**.

SPAIN

Internal Developments

4/94

Spanish government officials temporarily agree to postpone the development of the Capricornio space launch vehicle due to reduced defense outlays. The Spanish Minisat satellite will be launched on an Orbital Sciences Corporation's Pegasus rocket.

Space News, 4/11/94, p. 2 **(4028)**.

SYRIA

Syria with Iran

3/94

It is reported that Iran and Syria are jointly developing a cruise missile based on imported technology from Japan and Europe.

Security Affairs, 4/94, p. 11 **(3986)**.

Syria with North Korea

4/94

It is reported that the commander of the Israeli Home Front Command, Major General Ze'ev Livne, stated that Syria is acquiring Scud missiles and launchers from North Korea.

Qol Yisra'el (Jerusalem), 4/27/94; in FBIS-NES-94-082, 4/28/94, p. 41 **(3991)**.

Syria with Russia

4/27/94

During Israeli Prime Minister Yitzhak Rabin's visit to Moscow, Russian Deputy Foreign Minister Boris Kolokov states that Russia will not sell Syria offensive weapons. However, Russia would sell defensive weapons and the spare parts for equipment Syria already has. Western and Israeli sources say that Syria would like to purchase SA-10 'Grumble' air defense systems from Russia.

James Bruce, *Jane's Defence Weekly*, 5/14/94, p. 3 **(4100)**.

5/94

Israeli sources report that Russia and Syria are negotiating an arms deal that would involve the sale of SA-10 (S-300V) Grumble surface-to-air missiles as well as Su-27, Su-24, and MiG-29 fighters. This latest deal with Russia is made possible by an agreement in which much of Syria's $7 billion debt, accumulated from previous weapons sales, will be deferred pending the immediate transfer of $2 billion.

Flight International, 4/20/94, p. 16 **(3988)**. *Flight International*, 5/18/94, p. 17 **(3988)**.

5/94

The newspaper *Al-Hayat* states that Russia agreed to write off most of Syria's debt on the condition that Syria agrees to pay cash for its future purchases. Russia is thought to have written off 80% to 90% of Syria's $10 billion military debt. There are also indications that Russia and Syria have agreed upon an additional transfer of $500 million of equipment.

James Bruce, *Jane's Defence Weekly*, 5/14/94, p. 3 **(4100)**.

TAIWAN

INTERNAL DEVELOPMENTS

8/16/93

The president of Taiwan's Chung Shan Institute of Science and Technology, Admiral Liu Hsu-shi, states that the Institute has completed development of the Hsiung Feng 2 missile and is preparing a concept definition for the Hsiung Feng 3 missile that will include stealth and cruise missile technology. Liu says that Taiwan's Hsiung Feng class missiles are designed after the israeli Gabriel 2 missile.

Barbara Opall, *Defense News*, 2/7/94, p. 12 **(4036)**.

TAIWAN WITH FRANCE

3/94

Reports indicate that France's 1992 "order book" records the sale of a large number of unidentified missiles to Taiwan. The deliveries, however, are not expected to begin for a few years.

David Buchan, *Financial Times*, 3/2/94 **(4134)**.

TAIWAN WITH PRC

2/18/94

China announces that a delegation of over 100 aerospace officials will go to Taiwan in 3/94 to further space industry cooperation. Vice President of China Aerospace Corporation Wang Liheng states that while the two countries have no formal contacts, they "have many friendly contacts," but so far there are no plans for joint projects.

Reuter, 2/18/94; in Executive News Service, 2/21/94 **(4204)**.

TAIWAN WITH UNITED STATES

4/94

According to Reuter, Taiwan intends to purchase U.S. Patriot and Harpoon missiles. In Taiwan's 1995 defense budget, $118 million is allocated for the purchase of an undeclared number of Patriot missiles from the U.S. Raytheon Co. Taiwan's defense budget also includes money to buy Harpoon anti-ship missiles from the U.S. firm, McDonnell Douglas. In a previous deal, Taiwan agreed to purchase up to 41 Harpoon missiles from the U.S. for $68 million.

Arms Trade News, 4/94, p. 3 **(4032)**.

4/13/94

Deputy commander-in-chief of the Taiwanese army Lt. Gen. Chang Kuang-chin and other high-ranking officers brief Legislator Wang Tien-chin on the plan to purchase 200 improved Patriot missiles from the U.S. for more than NT$10 billion.

Lu Chao-lung, *Lien Ho Pao* (Taipei), 4/14/94, p. 1; in JPRS-TND-94-010, 5/5/94, pp. 5-6 **(4030)**.

TURKEY

TURKEY WITH ISRAEL

4/94

It is reported that Turkey and Israel intend to expand their political, economic, and trade ties, as the two countries are planning to hold negotiations in 5/94 concerning Turkey's purchase of the Cobra Night Targeting System from Israel. The Cobra system enables Cobra helicopters to acquire targets and guide missiles in either day or night. Israel also hopes to sell to Turkey unmanned aerial vehicles, and electronic countermeasure, and radar warning systems.

Barbara Opall, *Defense News*, 4/25/94, pp. 1, 34 **(4029)**.

TURKEY WITH RUSSIA

4/94

According to Turkish National Defense Minister Mehmet Golhan, Turkey will purchase long-range missiles from the Russian Federation in a cooperative move that will also provide Turkey with ballistic missile technology. Golhan states that Turkey made the move to procure missiles in response to Iranian and Syrian missiles. According to Golhan, Turkey and Russia have completed a framework agreement that will provide for technical cooperation on matters related to missile technology.

Ugur Sefkat, *Sabah* (Istanbul), 4/29/94, p. 12; in JPRS-TND-94-011, 5/16/94, p. 40 **(4243)**.

UKRAINE

INTERNAL DEVELOPMENTS

4/12/94

Ukrainian Vice-Premier Valeriy Shmarov states that Ukraine is capable of developing its own space industry. According to Shmarov, Ukraine has "designed and produced" over 400 spacecraft, including a series of Cosmos satellites, almost all of the Intercosmos series of satellites, and the Tsyklon and Zenit boosters. Shmarov states that over 100 Ukrainian enterprises and institutes had actively participated in the design and production of space machinery since the beginning of the Soviet space program. In 1993, Ukraine discussed having a space program and included such a program in the country's budget.

Mikhail Melnik, Itar-Tass (Moscow), 4/12/94; in JPRS-TND-94-010, 5/5/94, p. 38 **(3998)**.

UKRAINE WITH ESTONIA

4/21/94

The Estonian Minister of Defense meets with the Ukrainian Minister of Machine Building and Defense Conversion, Dmytro Chernenko, to discuss Estonia's interest in importing from Ukraine anti-aircraft weapons, guidance systems, and other weapons.

Ukrainian Weekly, 5/1/94, p. 2; in Respublika **(4095)**.

UKRAINE WITH MULTI-COUNTRY GROUP

2/3/94

Ukraine ratifies the START-I Treaty and accepts the Lisbon Protocol.

Dr. Bhupendra Jasani, *Jane's Intelligence Review*, 3/94, pp. 120-122 **(4298)**.

3/15/94

The head of Ukraine's space agency, Volodymyr Gorbulin, appeals to the West to agree to cooperate with Ukraine on space research in order to prevent Ukraine's aeronautics industry from collapsing.

Reuter, 3/15/94 **(4131)**.

5/5/94

The Vice President of the European Commission, Sir Leon Britten, visits the Ukrainian Hartron plant near Kharkov, Ukraine. The Hartron plant formerly manufactured SS-18 and SS-19 ICBM guidance systems, but now makes control systems for Ukraine's nuclear power plants. Britten will discuss a proposed European aid package to help Ukraine with its balance of payments and to aid Ukraine in shutting down the Chernobyl plant.

Roma Ihnatowycz, UPI, 5/5/94 **(4096)**.

UKRAINE WITH RUSSIA

2/94

Russian officials confirm that Russia no longer controls missile troops stationed in Ukraine as the commanders of the 43rd and 46th missile divisions have pledged loyalty to the government in Kiev.

Interfax (Russia); in Russia/CIS Intelligence Report, 2/22/94 **(4251)**.

UKRAINE WITH UNITED STATES AND MTCR

2/94

Ukrainian officials agree that if Ukraine wants to cooperate more closely with the U.S. on space, it will need to dismantle its nuclear weapons and abide by missile proliferation controls [MTCR]. The deputy director general of the Ukrainian National Space Agency, Andrei V. Zhalko-Titarenko, states, "Ukraine intends to act in the future as an independent state. The nuclear missile disarmament process has opened the door to cooperation between Ukraine and the USA in space." Ukraine manufactures the Zenit and Cyclone launch vehicles and also designs and builds electronics for Russian space equipment. According to Zhalko-Titarenko, Ukraine is also attempting to convert SS-18 and SS-24 ICBMs into small space launch vehicles. The Zenit rocket produced by Ukraine was originally supposed to replace Russia's Proton rocket as the primary servicing vehicle for the Mir 2 space station. After the Soviet Union collapsed and Ukraine and Russia became independent, Zenit became a competitor to Russia's Zenit and Soyuz rockets.

Peter B. de Selding, *Space News*, 2/14/94, pp. 3, 21 **(4099)**.

UKRAINE WITH UNITED STATES

3/23/94

The U.S. and Ukraine agree to increase cooperation between the two countries in space, although the U.S. did not agree to the contracts on rocket construction desired by Kiev. The head of Ukraine's space agency, Volodymyr Gorbulin, states that NASA had criticized Ukraine for not joining the MTCR. Ukraine continues to produce the Zenit booster at the Pivdenmash plant in Dnipropetrovsk.

Reuter, 3/15/94 **(4131)**. Reuter, 3/23/94 **(4131)**.

5/13/94

Ukrainian Deputy Prime Minister Valery Shmarov signs a memorandum with U.S Vice President Al Gore pledging that Ukraine will abide by the MTCR. According to U.S. officials, Ukraine pledged to abide by the MTCR in an attempt to attract business to its aerospace industry, which would otherwise be subject to U.S. sanctions. Ukraine continues to produce Zenit and Cyclone satellite launch vehicles. Ukraine has about 40% of the Soviet aerospace industry, including facilities for producing advanced missile guidance and control systems.

R. Jeffrey Smith, *Washington Post*, 5/14/94; in Executive News Service, 5/16/94 **(4272)**.

UNITED KINGDOM

INTERNAL DEVELOPMENTS

3/30/94

The British Defence Ministry announces that it will start decommissioning its relatively new fleet of Upholder diesel-powered submarines, which are capable of firing Harpoon anti-ship missiles from their torpedo tubes. Four submarines will be decommissioned; the HMS Unseen will be decommissioned in early 4/94, while the three other submarines will be decommissioned at a later date. All four Upholder submarines will soon be available for sale. According to Britain's national Press Association news agency, India, Pakistan, Malaysia, and Saudi Arabia are interested in purchasing these submarines.

Reuter, 3/30/94; in Executive News Service, 3/30/94 **(4050)**.

UNITED KINGDOM WITH CHILE

4/94

According to officials "close to the program," an agreement is near ratification between the Royal Ordnance (RO) of the U.K. and FAMAE of Chile for the development of the Rayo multiple rocket launcher system. The agreement covers the development of the Rayo system from the first phase through production, and will also include future sales. According to Malcolm Lassan, director of sales for the Rocket Systems and Motors division of RO, "The new manufacturing facility (near Santiago) is complete and field trials have been done with motors from that plant." The rocket has been redesigned to improve its dispersal accuracy and has been modified with a three-fin design; the fuzing has also been decided. The Rayo will be mounted on a 6x6 Mercedes-Benz OM442A vehicle, but is modular so that it can be mounted on various types of vehicles. The Chilean army is expected to purchase a

few of the systems, but the Rayo will be marketed primarily to international customers.

Jane's Defence Weekly, 4/2/94, p. 11 **(4255)**.

United Kingdom with Israel

5/26/93

In a written statement given to the UK House of Commons, Foreign Secretary Douglas Hurd announces the end of the 12-year UK arms embargo on Israel. The decision will allow the UK to sell arms to Israel and to purchase Israeli arms. The UK may be interested in purchasing a variant of the Israeli Popeye missile, which was designed by Rafael Armament Development Authority in Haifa, to fulfill the RAF's requirement for a conventional stand-off missile for the Tornado fighter. According to Rafael spokesman Noah Shachar, information on Popeye was given to the UK as a result of a request for information (RFI).

Sharone Parnes and Michael J. Witt, *Defense News*, 5/30/93, pp. 3, 26 **(4163)**.

United Kingdom with Malaysia

2/94

The government of Malaysia signs a contract with British Aerospace Defence Ltd. to purchase Seawolf missiles, spare parts, and a depot test facility. The Seawolf missiles, along with the spare parts and depot test facility, will complete a Malaysian naval defense purchasing package that includes two 2,000-ton frigates procured from GEC-Marconi in 3/92. The Vertical Launch Seawolf package will give the Royal Malaysian Navy the most advanced rapid-reaction, close-area defense capability available.

Wendy Lambourne, *Pacific Research*, 2/94, p. 33 **(4111)**.

2/26/94

Malaysian Defence Minister Najib Tun Razak states that Malaysia is searching for new sources for weapons now that it has announced a ban on contracts, potentially worth billions of pounds, with British companies. Malaysia will, however, honor a 1988 agreement to purchase 4.6 billion ringgit ($1.6 billion) in arms from Britain. Razak also stated, "Whatever has been contractually committed will continue, that is, all those contracts under the MOU (1988 memorandum of understanding)." Under the agreement with Britain, Malaysia purchased two Yarrow missile frigates, a Martello Marconi 3-D radar system, and short-range anti-aircraft missiles. The first Malaysian "Buy British Last" policy came after London imposed fees for foreign students in 1981. The 1981 "Buy British Last" policy came to an end following the 1988 arms agreement between Britain and Malaysia. The current ban was brought on by British press accusations of Malaysian government corruption.

Bill Tarrant, Reuter, 2/26/94; in Executive News Service, 3/1/94 **(4110)**.

United Kingdom with Russia

3/1/94

According to a statement released by Alexander Mikhailov of Russia's counterespionage service, a senior official in the Russian weapons industry confessed to being a spy for Great Britain's MI6. The "spy," a Russian citizen, was arrested on 1/15/94, and was charged with treason on 1/25/94. According to Mikhailov, the British spy was given "special communication equipment" to contact the British embassy in Moscow, and was paid for technical information on Russia's missile systems and the financing of defense research.

Intelligence Newsletter, 3/10/94, pp. 6-7 **(4008)**.

United Kingdom with United States

5/94

The British Government decides to purchase more than 50 Tomahawk cruise missiles from the United States for use on combat submarines. The highly accurate Tomahawk would give the United Kingdom a flexible response capability against threats from the Third World.

Krasnaya Zvezda, 5/16/94, p. 3 **(4044)**.

UNITED STATES

Internal Developments

2/2/94

The U.S. Senate passes the Foreign Relations Authorization Act for Fiscal Years 1994 and 1995, Section 730 of which states that the President must report to Congress 30 days before the U.S. advocates the admission of a new member country into the MTCR with a rationale for acceptance. The President must also notify Congress 30 days before it can license MTCR controlled exports intended for space launch vehicles. Section 757 states that "it shall be a rebuttable presumption" that countries declared by the U.S. State Department to be "sponsors of terror" would use exports of MTCR-controlled technology in ballistic missiles.

Arms Sales Monitor, 3/15/94, p. 7 **(4066)**.

3/22/94

Clinton administration officials state that the administration is proposing a series of agreements to prevent the deployment of ballistic missiles and the production of nuclear weapons in South Asia. One of the several steps proposed by Washington includes an agreement by both India and Pakistan to ban the deployment of surface-to-surface missiles that would allow both countries to quickly deliver a nuclear warhead. According to U.S. Under Secretary of State for International Security Affairs Lynn Davis, "India and Pakistan have the ability to move rather quickly to deploy nuclear weapons and are moving fast to deploy longer-range missiles."

Michael R. Gordon, *New York Times*, 3/23/94, p. A5 **(4093)**.

4/21/94

Deputy Defense Secretary John M. Deutch announces that the Pentagon has decided to purchase the Extended-Range Interceptor Missile [ERINT] rather than the upgraded Patriot missile because ERINT would better defend against ballistic missiles armed

with biological, chemical, or nuclear warheads. The Extended-Range Interceptor Missile is being developed by Loral Vought Systems, while the Patriot is designed by the Raytheon Company. Although the initial plan was to buy both missiles, decreasing defense budgets limited the Army to only one system. The Loral contract is valued at between $400 million to $800 million over the next five years.

AP, 4/24/94; in *New York Times*, 4/25/94, p. C6 **(4043)**. AP; in *New York Times*, 4/15/94, p. C3 **(4043)**.

United States with Egypt

3/94

The Egyptian government submits a confidential white paper to the U.S., which describes spare parts, maintenance, and training as Egypt's top three procurement priorities. In addition to emphasizing the acquisition of upgrades and spare parts, the white paper listed weapons that Egypt is requesting from U.S. surplus equipment stocks, including 12 Hawk Phase-3 air defense batteries and 18 other weapon systems.

Philip Finnegan, *Defense News*, 5/9/94, pp. 8, 16 **(4019)**.

4/11/94

The Clinton Administration notifies Congress of the sale of 32 AGM-84 Harpoon anti-ship missiles to Egypt, for use on two leased Knox-class frigates, as part of a $97 million naval package.

House Foreign Affairs Committee; in *Arms Sales Monitor*, 4/30/94, p. 9 **(3994)**.

United States with India

4/6/94

U.S. Deputy Secretary of State Strobe Talbott arrives in India to try to dissuade India from deploying its indigenously developed short-range Prithvi missile and intermediate-range Agni missile. In exchange for not deploying its missiles, India would receive some high-tech components from the U.S., conceivably for the new light combat aircraft that India plans to produce.

Washington Times, 4/16/94, p. A8 **(4120)**.

4/21/94

Indian Prime Minister P.V. Narasimha Rao denies having given the U.S. assurances that India will halt the testing of the Agni missile, and also denies that the U.S. is putting pressure on India to halt the testing.

Hindu, 4/30/94, p. 1 **(4283)**.

5/6/94

U.S sanctions imposed on India and Russia following their original cryogenic rocket engine deal expire.

Defense News, 5/2/94, p. 2 **(4020)**.

United States with Iraq

2/94

U.S. Ambassador to the U.N.-sponsored Conference on Disarmament Stephen Ledogar states that Iraq has failed to account for nearly 100 Scud missiles and has not fully complied with U.N. resolution 687. Ledogar further states that it will take six months to establish a monitoring regime in Iraq and at least a year before the oil embargo is lifted.

Mitya New, Reuter, 2/17/94; in Executive News Service, 2/21/94 **(4217)**.

United States with Israel

1/94

At a summit meeting with Syrian President Hafez al-Assad, U.S. President Clinton declares that the U.S. has agreed to open up space project "tenders" to Israeli technology that had previously been banned.

Bradley Burston, Reuter, 1/25/94 **(4076)**.

1/16/94

In a letter to Israeli Prime Minister Yitzhak Rabin, President Clinton states that the U.S. will implement a policy change permitting imports of equipment such as the Israeli Shavit launch vehicle. According to U.S. State Department officials, the U.S. policy change occurred because the imports are not considered to be a proliferation risk. A deal by the Atlantic Research Corporation to purchase the manufacturing rights for an apogee kick motor from Rafael Armament Development also prompted the policy change. The policy change has been criticized by proliferation experts, such as Henry Sokolski, who claims that it "runs against the spirit of the Missile Technology Control Regime."

John J. Fialka, *Wall Street Journal*, 2/2/94, p. A12 **(4151)**.

4/94

The U.S. Ballistic Missile Defense Organization (BMDO) is evaluating an Israeli request that the Israeli Test Bed (ITB), an anti-tactical ballistic missile simulator, be made available for use by "third-countries." The simulator was built to BMDO specifications by Tadiran, an Israeli company, with $35 million from the BMDO. The ITB allows the simulation of tactical surface-to-surface missile attacks in different defense situations and gives Israel and the U.S. the ability to design and test tactical missile defense "system architecture." The ITB is part of U.S. assistance to Israel for the development of an anti-tactical ballistic missile capability, of which the Arrow missile is the central piece.

Flight International, 4/27/94, p. 18 **(4162)**.

5/24/94

Director of the U.S. Ballistic Missile Defense Organization (BMDO) Lt. Gen. Malcolm R. O'Neill states that if the Israeli Arrow program is to continue to receive BMDO funding, it must demonstrate a successful intercept. Additionally, BMDO requires a memorandum of understanding (MoU) delineating U.S. and Israeli roles in the Arrow program, and "certification" that no program technology will be transferred to third countries.

Aerospace Daily, 5/25/94, p. 307 **(4233)**.

6/94

Israeli Aircraft Industries and Rafael are to complete a "preliminary feasibility" study of the use of missile-equipped UAVs to intercept theater ballistic missiles. The $6 million study is funded by the Israeli government and the U.S. Ballistic Missile Defense Organization.

Flight International, 5/4/94, p. 13 **(4135)**.

UNITED STATES WITH JAPAN

2/94

Japanese National Space Development Agency spokesman Shoshin Sonoda states that the drive of the H-2 program is "to break from under the U.S. umbrella." The launching of the H-2 signals the end of Japanese dependence on U.S. space technology. The earlier Japanese H-1 booster engine was designed by the U.S.'s McDonnell Douglas. A bilateral agreement between the U.S. and Japan allows the U.S. to restrict the commercial use of such rocket technology.

Kumiko Makihara, *Time*, 2/7/94, p. 24 **(4037)**.

2/94

Kyodo News Service announces that Japan's ruling coalition has allocated funds in the 1994 defense draft budget for the purchase of Patriot missiles and two additional Airborne Warning and Control System (AWACS) electronic surveillance planes from the U.S. The surface-to-air Patriot missiles will enhance Japan's ability to counter attacks made by missiles and planes.

Washington Times, 2/11/94, p. A18 **(4015)**.

4/94

The chief of Dual-Use Technology Policy/ International Programs at the U.S. Pentagon, Kenneth Flamm, is to lead a Pentagon delegation to Japan to discuss a proposed joint U.S. and Japanese Theater Missile Defense (TMD) program. Flamm is trying to move ahead with the "Perry Initiative," a plan to exchange U.S. military technology for Japanese commercial dual-use technology. The Perry Initiative focusses on the transfer to the U.S. of opto-electronics, composite materials, and manufacturing technologies from Japanese commercial industries in exchange for U.S. military technology. According to a U.S. diplomatic source, the Pentagon is eager to reach a deal with the Japanese Defense Agency on TMD because of North Korea's test of the Nodong-1, an intermediate-range ballistic missile. The Japanese constitution forbids the sale of weapons or weapons technology abroad, and even "non-lethal" technologies to be shared with or sold to the U.S. are intensely debated by the Japanese Diet. Another problem facing Japan is the possibility that TMD would include a space-based component which would be forbidden by Japanese law as it constitutes a "militarization" of space. The U.S. states that any space-based component would be supplied solely by the U.S., thus avoiding any violation of Japanese law. A diplomatic source says that Japan has been "exemplary" in the manner in which it has handled technology given by the U.S., such as the Aegis ship-based air defense system, Patriot missile system and AWACS surveillance planes.

Aerospace Daily, 3/15/94, pp. 397-398 **(4017)**.
Inside The Pentagon, 3/3/94, p. 3 **(4017)**.

4/94

U.S. Deputy Assistant Secretary of Defense Kenneth Flamm states, "We [the U.S.] will offer unprecedented access to our military technology in exchange for some key dual-use technology for use in our defense." Flamm is referring to the U.S.-initiated "Technology for Technology" from which the U.S. hopes to gain access to cutting edge Japanese technology such as electronics for flat panel displays, composite materials for aircraft, and ceramics for use in engines.

David Holley, *Los Angeles Times*, 5/23/94, p. D3 **(4033)**.

UNITED STATES WITH MULTI-COUNTRY GROUP

1/94

The North Atlantic Treaty Organization (NATO) rejects the counter-proliferation proposal put forth by former Defense Secretary Les Aspin because of its reliance on theater missile defenses and preemptive strikes. NATO has since formed two working groups to review political and military options to counter the proliferation of weapons of mass destruction in the Third World. The NATO working groups are likely to recommend ballistic missile defenses at meetings of the Defense Planning Committee in 5/94 and the North Atlantic Council in 6/94. Missile defense is favored by southern European countries due to the potential threat of missile attacks by Libya and other North African states.

Inside The Pentagon, 2/24/94, p. 3 **(4048)**.

2/10/94

U.S. Assistant Secretary of State for Political and Military Affairs Robert Gallucci, when questioned about the role of COCOM in the control of dual-use missile technology, states that the MTCR is the key regime for stemming the tide of dual-use missile technology and that the regime has been "remarkably successful." Gallucci indicates that the regime has isolated a "very, very small number of suppliers of ballistic missile technology outside the MTCR regime," including the PRC in one "special" case, and North Korea.

Robert L. Gallucci, *Arms Control Today*, 4/94, pp. 13-16 **(4166)**.

UNITED STATES WITH NORTH KOREA

4/94

U.S. Assistant Secretary of Defense for International Security Policy Ashton Carter states that there is a danger that North Korea would export nuclear weapons, as it is already an exporter of missile technology. Carter emphasizes that North Korea may prefer an alternate means of nuclear weapons delivery to its missile program, adding that no reliable determination of the missiles' accuracy has been made and that lifting COCOM restrictions would not help in North Korean missile guidance development as the missile program is completely indigenous.

Aerospace Daily, 4/11/94, p. 55 **(4155)**.

UNITED STATES WITH NORWAY

4/94

The Norwegian Army is finishing tests of the U.S.-designed Multiple Launch Rocket System (MLRS), and, if the army recommends it, an MLRS battalion may be purchased for the North Norway division. The South Norway division may also receive a MLRS battery.

Jane's Defence Weekly, 4/30/94, p. 5 **(4045)**.

UNITED STATES WITH PRC

1/25/94

Liu Jiyuan, president of the China Aerospace Corp., and administrator of the China National Space Administration, states that U.S. sanctions imposed on China in 8/93 for the alleged sale of missile parts to Pakistan in 11/92 are hurting China's space program. According to Liu, the U.S. sanctions have caused delays in the development of the Dong Fang Hong-3 (DFH-3) and loss of launch sales, and have damaged the reputation of Chinese space organizations.

Andrew Lawler, *Space News*, 2/14/94, pp. 1, 25 **(4200)**.

1/26/94

The U.S. and China began two days of talks on nonproliferation issues such as missile transfers and a comprehensive nuclear test ban. According to senior U.S. officials, an effort will be made to reach an agreement which will allow the U.S. to lift its sanctions on the sale of U.S. satellites to China.

Carol Giacomo, Reuter, 1/26/94 **(4189)**.

2/94

James R. Lilley, U.S. Assistant Secretary of Defense for International Security in the Bush Administration and an expert on China, says that China is attempting to acquire submarine-launched ballistic missile technology, muffled submarine propulsion, and a more efficient air-refuelling system. Lilley also says that China is attempting to refine the trajectories of its cruise missiles.

Aviation Week & Space Technology, 2/28/94, pp. 24-25 **(4185)**.

3/7/94

U.S. Secretary of State Warren Christopher announces that Hughes will remove a decryption chip from the Optus B3 satellite, clearing the way for satellite launches, valued at about $1 billion, by China's Long March rocket over the next two years. Christopher states that the decision to proceed with the launch "was consistent with our law and served our commercial purposes." The launch had originally been held up by the State Department on the grounds that it involved sensitive technology controlled by MTCR guidelines. The launch is made possible as an incentive to get the Chinese to sign the MTCR.

Jim Mann, *Los Angeles Times*, pp. D1, D7 **(4197)**. Michael Mecham and Michael A. Dornheim, *Aviation Week & Space Technology*, 3/14/94, p. 35 **(4196)**. *Arms Control Today*, 4/94, p. 28 **(4125)**.

3/11/94-3/14/94

The State Department visit to China fails to break the impasse in the negotiations to get China to sign the MTCR. The U.S. will lift the sanctions on China, which were imposed on 8/25/93 for selling M-11 missiles to Pakistan, if China formally signs the MTCR and "comes to an understanding" concerning future Chinese missile and missile technology transfers to Pakistan. China wants the U.S. to remove its sanctions before it will sign the MTCR. China says that it already abides by the MTCR. In a subsequent statement, U.S. Undersecretary of State for International Security Lynn Davis states that the U.S. is closely watching China and is willing to impose stricter sanctions if China "steps out of line."

Inside The Pentagon, 3/24/94, pp. 9-10 **(4129)**. *Defense Daily*, 3/23/94, p. 436 **(4129)**. *Arms Control Today*, 4/94, p. 28 **(4125)**.

UNITED STATES WITH RUSSIA

3/14/94

U.S. Secretary of State Warren Christopher and Russian Foreign Minister Andrey Kozyrev agree that Russian experts will participate in drafting a new COCOM. A high-ranking diplomat close to Kozyrev states that Russian participation in the drafting of a new COCOM is an important aspect of U.S.-Russian cooperation on the nonproliferation of missiles and other "dangerous know-how."

Interfax (Moscow), 3/15/94; in FBIS-SOV-94-051, 3/16/94, p. 9 **(4002)**.

5/6/94

U.S. sanctions imposed on India and Russia following their original cryogenic engine deal expire.

Defense News, 5/2/94, p. 2 **(4020)**.

UNITED STATES WITH SOUTH AFRICA

2/24/94

A U.S. State Department official says that the proposed launch of a South African remote-sensing satellite on a converted Russian SS-25 ICBM poses fewer proliferation concerns because the launch will not take place in South Africa. If the launch were to take place in South Africa, there would be greater concern that Russian technology could be diverted to South African offensive military programs.

Ben Iannotta, *Space News*, 2/28/94, p. 8 **(4073)**.

UNITED STATES WITH SOUTH KOREA

3/21/94

U.S. President Clinton announces the deployment of a battery of Patriot missiles, including 850 soldiers, to South Korea, stating, "We have agreed that it is in our national interests and in the interest of the people of South Korea and the security of our armed forces there to proceed with the Patriot deployment. So we will do that." President Clinton added, "I want to emphasize that this decision on the Patriots is purely defensive in nature." The Patriots are to be stationed around U.S. bases near Seoul and other key sites.

R. Jeffrey Smith and Ann Devroy, *Washington Post*, 3/22/94, pp. A1, A12 **(4232)**. Barry James, *International Herald Tribune*, 3/22/94 **(4239)**.

3/23/94

South Korean defense Minister Yi Pyong-tae comments on the five-stage ROK-U.S. Combined Operations Plan (OP 5027) strategic concept, the second-stage of which foresees the combined forces of South Korea and the U.S. intercepting concentrated Scud, Nodong-1, and Nodong-2 missile attacks on Seoul with Patriot missiles. According to the operations plan, North Korea has approximately 2,400 multiple-warhead missiles within 100 km of the DMZ. This arsenal includes Scud, Nodong-1 and Nodong-2 SSMs. The Taep'o-dong-1 and -2 missiles are believed to be in development and it is unclear if operational missiles of this kind are available for deployment now.

Kim Chun-pom, *Chungang Ilbo* (Seoul), 3/24/94, p. 2; in JPRS-TND-94-008, 4/1/94, pp. 7-8 **(4171)**.

UNITED STATES WITH TAIWAN

4/94

According to Reuter, Taiwan intends to purchase U.S. Patriot and Harpoon missiles. In Taiwan's 1995 defense budget, $118 million is allocated for the purchase of an undeclared number of Patriot missiles from the U.S. Raytheon Co. Taiwan's defense budget also includes money to buy Harpoon anti-ship missiles from the U.S. firm, McDonnell Douglas. In a previous deal, Taiwan agreed to purchase up to 41 Harpoon missiles from the U.S. for $68 million.

Arms Trade News, 4/94, p. 3 **(4032)**.

4/13/94

Deputy commander-in-chief of the Taiwanese army Lt. Gen. Chang Kuang-chin and other high-ranking officers brief Legislator Wang Tien-chin on the plan to purchase 200 improved Patriot missiles from the U.S. for more than NT$10 billion.

Lu Chao-lung, *Lien Ho Pao* (Taipei), 4/14/94, p. 1; in JPRS-TND-94-010, 5/5/94, pp. 5-6 **(4030)**.

UNITED STATES WITH UKRAINE

3/23/94

The U.S. and Ukraine agree to increase cooperation between the two countries in space, although the U.S. did not agree to the contracts on rocket construction desired by Kiev. The head of Ukraine's space agency, Volodymyr Gorbulin, states that NASA had criticized Ukraine for not joining the MTCR. Ukraine continues to produce the Zenit booster at the Pivdenmash plant in Dnipropetrovsk.

Reuter, 3/15/94 **(4131)**. Reuter, 3/23/94 **(4131)**.

UNITED STATES WITH UNITED KINGDOM

5/94

The British Government decides to purchase more than 50 Tomahawk cruise missiles from the United States for use on combat submarines. The highly accurate Tomahawk would give the United Kingdom a flexible response capability against threats from the Third World.

Krasnaya Zvezda, 5/16/94, p. 3 **(4044)**.

YEMEN

INTERNAL DEVELOPMENTS

5/6/94

A North Yemeni spokesman accuses South Yemen of firing Russian-made Scud missiles at the northern capital of Sanaa from bases in the southern capital of Aden, 300 km away. Five missiles in all are fired: two explode in the mountains outside of Sanaa, one explodes near the Sanaa airport, and two impact without exploding, one near the presidential palace. South Yemen had six Scud-B missiles and twelve Frog-7 rockets prior to unification in 1990, but according to diplomats in the region, both sides have been procuring arms since 8/93 when the dispute between the two Yemeni leaders began.

Ashraf Fouad, Reuter, 5/6/94; in Executive News Service, 5/9/94 **(4091)**.

5/11/94

At 1:00 A.M., a Scud missile, fired from Southern Yemeni forces, strikes the Northern Yemeni capital of Sanaa, killing 23 and injuring many more. Five homes are destroyed or damaged in the attack, and one missile falls within 200 m of Northern President Ali Abdullah Saleh's former residence. Residents report at least 15 missiles have struck Sanaa in a one week period, while Northern officials report at least 20 Scud attacks, which include other towns and military bases. One diplomatic source says,"The Scud attacks have exposed Yemeni cities as soft targets for these maverick weapons."

Assem Abdel-Mohsen, Reuter, 5/11/94; in Executive News Service, 5/11/94 **(4174)**. Christine Hauser, Reuter, 5/11/94; in Executive News Service, 5/11/94 **(4174)**. Sajid Rizvi, UPI, 5/12/94; in Executive News Service, 5/12/94 **(4174)**.

5/15/94

Northern Yemeni parliamentary speaker Abdullah al-Ahmar states in a news conference in Sanaa that a Scud missile impacted near the village of Rawda, 15 km from Sanaa, on the night of 5/14/94, but caused no damage or fatalities. Ahmar calls on the international community to halt "the use of such mass destruction weapons" as it had done in the 1991 Gulf War against Iraq.

Assem Abdel-Mohsen, Reuter, 5/15/94; in Executive News Service, 5/16/94 **(4172)**.

5/22/94

A Northern Yemeni "missile," believed to be a Russian-made Frog-7 [rocket], explodes near Aden airport, killing eight people.

Reuter, 5/26/94; in Executive News Service, 5/27/94 **(4175)**.

5/23/94

South Yemen launches a missile attack against the North Yemeni capital of Sanaa. Northern Yemeni officials state that 13 people are killed and about 100 people are wounded. A Southern Yemeni radio broadcast denies any involvement in the missile attack and accuses Northern Yemen of exaggerating the number of people killed in the attack to "divert attention" away from Northern Yemen's military advances into the South.

Sajid Rizvi, UPI, 5/24/94; in Executive News Service, 5/24/94 **(4278)**. Assem Abdel-Mohsen, Reuter, 5/24/94; in Executive News Service, 5/25/94 **(4278)**.

5/24/94

North Yemeni Planning Minister Abdel-Karim al-Iryani states "When our long-range artillery arrives in Abyan (northeast of Aden) we will stop using missiles against Aden airport because the artillery is more accurate." North Yemen plans to approach the Salaheddin base from which the South Yemenis have been launching missiles at Sanaa.

Jonathan Wright, Reuter, 5/25/94; in Executive News Service, 5/25/94 **(4262)**.

5/25/94

Northern Yemeni forces fire several "missiles" at the Southern capital of Aden.

Reuter, 5/26/94; in Executive News Service, 5/27/94 **(4175)**.

5/26/94

According to Southern Yemeni officials, at 1:45, Southern anti-aircraft gunners shoot down two Northern Yemeni missiles, while another missile impacts on a beach near Aden's airport. The Northern Yemeni rocket

attacks are in retaliation for Southern Yemeni Scud missile attacks on the Northern capital of Sanaa, which killed 36 people, and are intended to shut down the Aden airport to keep Southern aircraft from flying sorties against Northern forces advancing on Aden.

Reuter, 5/26/94; in Executive News Service, 5/27/94 **(4175)**.

6/18/94

According to a Southern Yemeni military statement on Aden radio, Northern Yemeni troops surrounding Aden fire three missiles at the city; two are reportedly "shot down" by air defenses, and the third impacts in the sea. No damage or fatalities are reported.

Reuter, 6/19/94; in Executive News Service, 6/21/94 **(4090)**.

YUGOSLAVIA

INTERNAL DEVELOPMENTS

3/94

It is reported that the Yugoslav navy operates both land- and sea-based Styx anti-ship missiles. The navy also has six SSC-3 'Shaddock' batteries. The Yugoslav navy is reportedly emphasizing longer range land-based anti-ship missiles and air defense.

Milan Vego, *Jane's Intelligence Review*, 3/94, pp. 104-108 **(4271)**.

YUGOSLAVIA WITH ITALY

2/12/94

Italian Defense Minister Fabio Fabbri claims that the Serbian army does not have missiles with ranges capable of targeting Italy. In the spring of 1993, Seselj, the leader of the Serbian ultra-nationalist Radical Party, threatened to fire missiles at Italy.

Reuter, 2/12/94; in Executive News Service, 2/15/94 **(4027)**.

YUGOSLAVIA WITH MULTI-COUNTRY GROUP

2/10/94

The leader of the Serbian ultra-nationalist Radical Party, Seselj, warns that Serbia will bomb all NATO targets within range if NATO launches air strikes.

Reuter, 2/12/94; in Executive News Service, 2/15/94 **(4027)**.