

BALLISTIC, CRUISE MISSILE, AND MISSILE DEFENSE SYSTEMS: TRADE AND SIGNIFICANT DEVELOPMENTS, JUNE 1994-SEPTEMBER 1994

AFGHANISTAN

INTERNAL DEVELOPMENTS

9/27/94

Rocket and mortar attacks leave 58 people dead and 224 wounded in Kabul. Kabul radio attributes this attack to factions opposing President Burhanuddin Rabbani. More than 100 rockets and mortar shells are fired on residential areas of Kabul by anti-Rabbani militia under the control of Prime Minister Gulbuddin Hekmatyar and northern warlord General Abdul Rashid Dostam.

Wall Street Journal, 9/28/94, p. 1 (4333).

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.

RUSSIA WITH AFGHANISTAN AND TAJIKISTAN

8/10/94

According to Russian military forces in Dushanbe, the 12th post of the Moscow border troops headquarters in Tajikistan is attacked by missiles fired from Afghan territory. The Russians respond with suppressive fire on the missile launcher emplacement; no casualties are reported.

Itar-Tass (Moscow), 8/11/94; in FBIS-SOV-94-155, 8/11/94, p. 36 (4564).

8/27/94

During the early morning hours, Tajik Mujaheedin launch several missiles at the Russian Frontier Guard observation position and post on the Turk Heights in Tajikistan. The missiles are launched from the area of the Afghan-Tajik border and from Afghan territory, according to the second commander of Russian border guards in Tajikistan, Major General Aleksandr Savchenko. No Russian soldiers are killed.

Galina Gridneva, Itar-Tass (Moscow), 8/28/94; in FBIS-SOV-94-167, 8/29/94, p. 48 (4392).

AUSTRALIA

INTERNAL DEVELOPMENTS

7/94

It is reported that Australia's University of Queensland can produce a scramjet air-breathing engine, which may offer payload and cost advantages over conventional SLVs.

Chris Schacht, *Australian* (Sydney), 7/20/94, p. 6; in FBIS-EAS-94-152, 8/8/94, pp. 89-90 (4405).

7/94

It is reported that the Australian government awarded Australia's AWA Defence Industries (AWADI) a \$17 million contract to produce the Active Missile Decoy (AMD) system, a "hovering rocket-propelled anti-ship missile decoy system" providing for ship defense against sea-skimming missiles. AWADI will also develop a fire control system to coordinate a ship's decoy and combat data systems. The AMD system was jointly developed by Australia and Sippican of the U.S., who developed the electronic payload.

Flight International, 7/13/94, p. 16 (4430).

AUSTRALIA WITH RUSSIA

7/94

The new launch complex that is being developed by Russia and the Australian company Space Transportation Systems (STS) on Papua New Guinea, which has a completion date of 1998, will allow Russia to double the payload it can launch into geostationary orbits on its Proton rockets from 2.4 metric tons to 4.8 metric tons.

Journal of Commerce, 1/21/94, p. 3A; in *RA Report no. 17*, 7/94, p. 75 (4607).

BELARUS

BELARUS WITH RUSSIA

5/18/94

Russia withdraws the first shipment of SS-25 ICBMs from Belarus. At present, it is believed that 27 SS-25s have been withdrawn from Belarus to Russia.

Neue Zurcher Zeitung, 5/20/94; in *Arms Control Today*, 6/94 (4522). PPNN Newsbrief, Second Quarter, p. 17 (4522).

BOSNIA

INTERNAL DEVELOPMENTS

6/94

According to NATO intelligence sources, the Bosnian-Serb Army maintains a large facility for modifying and upgrading its air defense systems which routinely works on SA-2, SA-3, and SA-6 SAMs. The facility, which is reportedly near Banja Luka, comprises three administration and six production buildings, and may be developing and installing fire control sensors and/or passive electro-optical search technology. A

Fan Song-E C-band targeting and missile guidance radar, the core of the SA-2 Guideline SAM system, and an SA-6 TEL have been photographed at the site. The Bosnian-Serb Army deploys the SA-2 system, generally with as many as six launchers, and also deploys dummy SAM sites to spoof NATO aircraft.

Joris Janssen Lok, *Jane's Defence Weekly*, 6/11/94, p. 25 (4309).

BRAZIL

INTERNAL DEVELOPMENTS

7/94

It is reported that Brazil is developing a four-stage rocket that can carry a 440 lb payload. The rocket, which may be ready for deployment in 1995, could allegedly be used as an intermediate-range missile.

For Your Eyes Only, 7/11/94 (4378).

CROATIA

CROATIA WITH UKRAINE

7/22/94

The Ukrainian Defense Ministry press service denies a report by the Serbian publication *Novny* that stated that Croatia has procured 20 S-300 anti-missile systems from Ukraine. The Ukrainian Defense Ministry press service states that Ukraine operates in accordance with the moratorium on the sale of arms to combative nations.

Radio Ukraine World Service (Kiev), 7/22/94; in FBIS-SOV-94-142, 7/25/94, p. 35 (4312). *Krasnaya Zvezda*, 7/26/94, p. 1; in FBIS-SOV-94-147, 8/1/94, pp. 32-33 (4605).

DENMARK

INTERNAL DEVELOPMENTS

9/94

It is reported that the Royal Danish Navy has activated two Harpoon Coastal Defence System (HCDS) batteries containing Harpoon Block 1C missiles. Each battery is comprised of two launch vehicles and a mobile launch and command center situated on a Scania truck and built for rapid deployment. The mobile launch and command center houses the guidance, launch data, and communication systems and travels with the missile launch vehicles. Four missiles are fitted on each launch vehicle.

Charles Bickers, *Jane's Defence Weekly*, 9/24/94, p. 5 (4433).

EGYPT

EGYPT WITH UNITED STATES

9/94

McDonnell Douglas is awarded an \$125 million contract by the U.S. Navy for 75 SLAMs and 44 Harpoon missiles. Of the 44 Harpoon missiles currently covered by the deal, Egypt will receive 16, Japan three, and Malaysia 25. Work on the contract is expected to be completed by 12/96.

Reuter, 8/22/94; in *Executive News Service*, 8/24/94 (4347). *Flight International*, 9/14/94, p. 40 (4347).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

FRANCE

INTERNAL DEVELOPMENTS

5/94

French President Francois Mitterand states that France is planning to manufacture four *Triomphant*-class submarines instead of six and that they will be equipped to carry an upgraded version of the M4 missile, the M45 SLBM, which will be used until it is replaced by the M5 SLBM in 2010. Mitterand states that France is continuing work on the development of a longer-range version of the ASMP air-to-surface, medium-range nuclear missile, known as the ASLP air-launched missile. According to Mitterand, France is also developing a new land-based version of the M45 SLBM to replace the S3 IRBM in 2005.

Dunbar Lockwood and Adam Grissom, *Arms Control Today*, 9/94, p. 8 (4575).

8/94

It is reported that France has decided to postpone the deployment of its future long-range nuclear missile, the M5, until 2010.

Financial Times, 8/4/94; in PPNN Newsbrief, Second Quarter, p. 10 (4427).

9/94

According to officials from Matra Defense of France, an Apache prototype cruise missile completes its first long-range test at the French Air Force's In-Flight Test Center located at Cazaux. The Apache is guided over 140 km (84 mi) to a target by satellite control. Frederic Aragon of Matra states that the first test of the Apache is significant because it marks the critical technical phase for the conventional-warhead stand-off missile development program. It is estimated that the Apache will be deployed on German Tornado and French Mirage 2000-D aircraft starting in 1997.

Reuter, 9/6/94; in Executive News Service, 9/7/94 (4435). *Defense News*, 9/26/94, p. 18 (4441).

9/23/94

Patrick Mercillon, spokesman for Aerospatiale Missiles of Chatillon, the manufacturer of the SM-39 Exocet anti-ship missile, states that "the United States has exported the submarine-launched Harpoon to nine countries, so this kind of missile has already been proliferated. We are simply doing what our competitors have already done."

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

FRANCE WITH MULTI-COUNTRY GROUP

6/20/94

The French space agency and its Ariane-5 contracting team conducts, with the European Space Agency, the third test-firing of the 1.3 million pound thrust Ariane-5 solid-fuel booster at Kourou, French Guiana. Because of a propellant viscosity problem resulting from ammonium perchlorate grains supplied by Espera, a subsidiary of France's SNPE company, the test-firing is conducted using a U.S. propellant supplied by Kerr-McGee.

Craig Covault, *Aviation Week & Space Technology*, 6/27/94, p. 81 (4556).

FRANCE WITH PAKISTAN

9/21/94

France and Pakistan sign a \$950 million deal that includes three Agosta 90-B submarines and the transfer of technology. The deal also includes training and long-term logistical support, and reportedly gives the Pakistani Navy "offensive capabilities far superior to those of most non-NATO navies." The submarines are equipped with Air-Independent Propulsion (AIP) and are armed with torpedoes and SM-39 Exocet anti-ship missiles. The Exocets can be fired while a submarine is submerged.

Jawed Naqvi, Reuter, 9/23/94 (4331). Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

9/23/94

A senior French defense official states that Pakistan feels that "the combination of AIP

and SM-39s will give [Pakistan] a very cost-effective anti-blockade deterrent" against the Indian Navy during a conflict. According to an official of the French Defense Procurement Agency (DGA), the first of the three Agosta submarines will be delivered to Pakistan by late 1998. The first submarine will be built completely in France, the second will be assembled in Pakistan after being partially built in France, and the third will be built entirely in Pakistan. The work in Pakistan on the second and third submarines will be done at the Karachi Naval Shipyards.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

FRANCE WITH UKRAINE

5/94

It is reported that Aerospatiale of France and Yuzhnoe of Ukraine have signed four contracts which provide for the conversion of SS-24 oxygen tanks to containers for liquid oxygen and kerosene; the use of SS-24 missiles and components to manufacture small rockets that will launch satellites into a low-earth orbit from France's space center in Guiana; the use of a 30 ton thrust engine as the second stage booster for small rockets; and the conversion of SS-24 ICBM missile components to boosters for the Ariane-5 SLV.

Ukrinform (Kiev), 5/30/94; in FBIS-SOV-94-105, 6/1/94, pp. 46-47 (4487).

7/94

It is reported that Ukraine is initiating joint technology transfers with France's CNES and the U.S. NASA, as well as booster development with U.S. Boeing and France's Aerospatiale for the 461-ton "piggyback" air-launched Zenit booster.

Intelligence Newsletter, 7/26/94, p. 7 (4488).

FRANCE WITH UNITED KINGDOM

9/94

It is reported that Matra and Aerospatiale of France are interested in entering the U.K. conventionally armed air-launched stand-off missile (CASOM) competition with the

Apache and ASMP-C missiles.

Flight International, 9/14/94, p. 16 (4308).

GERMANY

GERMANY WITH IRAQ

7/19/94

German businessman Anton Eyerle, owner of Rhein-Bayern Fahrzeugbau, is sentenced to five-and-a-half years imprisonment because his firm continued to deliver missile components to Iraq after the invasion of Kuwait in 8/90. The firm supplied more than 1,000 ignition systems for Iraqi Styx and Scud missiles.

International Herald Tribune, 7/20/94 (4600).

GREECE

GREECE WITH UNITED STATES

5/94

Israel, Greece, and Japan finalize a \$43.4 million Foreign Military Sales contract with the U.S. Loral Vought Systems for the purchase of Multiple Launch Rocket Systems (MLRS) and rockets. By 9/95, Japan will receive 72 practice rockets; by 12/96, Israel will receive 6 MLRS launchers, 726 tactical rockets, and 720 practice rockets; and by 2/97, Greece will take delivery of 9 MLRS launchers and 132 reduced-range practice rockets.

International Defense Review, 8/94, p. 17 (4466).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the

U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

INDIA

INTERNAL DEVELOPMENTS

4/94

India commissions a radar system at Gadanki near Tirupati to conduct research in atmospheric science and to help space scientists with safe rocket launches from the Sriharikota site, which is located 80 km away.

Statesman (Calcutta), 4/27/94, p. 11; in JPRS-TND-94-012, 6/7/94, p. 22 (4527).

5/15/94

Pakistan's Chief of Naval Staff Admiral Saeed Khan says that India is reportedly working on the development of nuclear propulsion capability, which is "ominous" given India's nuclear capability and ballistic missile programs.

Nation (Islamabad), 5/16/94, pp. 1, 4; in JPRS-TND-94-012, 6/7/94, p. 15 (4426).

5/30/94

An official with India's Defence Research and Development Laboratory (DRDL) states that measures are being taken to correct a problem with a faulty nozzle on the propellant loading system of the Prithvi missile which is allowing propellant to seep into the engine casings. This problem caused a scheduled 5/13/94 launch to be cancelled indefinitely.

Theresa Hitchens and Vivek Raghuvanshi, *Defense News*, 6/6/94, p. 22 (4624).

6/94

It is reported that the Indian defense ministry has offered to sell Indian Air Force equipment, including 161 lines of electronic equipment for the Russian surface-to-air missile (SAM II) guidance system, 126 serviceable missiles, 35 SAM II launchers, and missile liquid propellants. Specifically, the

missile propellants listed are 92 liters of "O" fuel (nitric acid), 53,124 liters of "G" fuel and 20,785 liters of IPN. India's Agni and Prithvi missiles use "O" and "G" fuel.

Times of India (Bombay), 4/12/94, pp. 1, 9; in JPRS-TND-94-012, 6/7/94, p. 22 (4553).

6/1/94

At a beach in Payyoli, Indian fisherman discover and drag ashore what is believed to be a surface-to-surface missile. The missile, missing its front portion but with elevators, stabilizers, and rudders intact, is 6 m long, 2.5 m wide, and is marked with a Russian inscription. The object is identified as an SSM by the District Collector, Amitabh Kant, and Commodore S. Soman from the local NCC [National Cadet Corps] unit. District authorities request that Naval experts in Cochin and the Indian Space Research Organization in Trivandrum contact Payyoli.

Hindu, 6/11/94, p. 13 (4323).

6/4/94

At 11:35 am, a Prithvi is launched from a mobile launcher near the Interim Testing Range (ITR) at the Chandipur-on-Sea facility on the Balasore coast and hits its target 80 km away on Wheeler Island, four minutes after its launch. This is the 13th test-launch of the Prithvi and its first user trial. It is also the first time the Prithvi carries a live warhead.

Venkatnarain, All India Radio Network (Delhi), 6/7/94; in FBIS-NES-94-109, 6/7/94, p. 72 (4497). *Navbharat Times* (Bombay), 6/7/94, p. 9; in JPRS-TND-94-017, 7/13/94, p. 32 (4525). *Aviation Week & Space Technology*, 6/13/94, p. 21 (4325). Laxmi Shankar Yadav, *Dainik Jagran* (Delhi), 6/19/94, p. 6; in JPRS-TND-94-014, 7/13/94, pp. 34-37 (4530). *Asian Recorder*, 6/25/94, pp. 24048-24049 (4623). Sunil Dasgupta, *India Today*, 6/30/94, p. 93 (4525). *Asian Recorder*, 7/2/94, pp. 24065-24066 (4525).

6/6/94

The Indian Army successfully launches the Prithvi missile in its second user trial to the missile's maximum range of 250 km. Another report states that the target is 145 mi away and that the missile reached it 4 minutes and 47 seconds after launch.

Venkatnarain, All India Radio Network (Delhi), 6/7/94; in FBIS-NES-94-109, 6/7/94, p. 72 (4497). *Navbharat Times* (Bombay), 6/7/94, p. 9; in JPRS-TND-94-017, 7/13/94, p. 32 (4525). Laxmi Shankar Yadav, *Dainik Jagran* (Delhi), 6/19/94, p.

6; in JPRS-TND-94-014, 7/13/94, pp. 34-37 (4530). Sunil Dasgupta, *India Today*, 6/30/94, p. 93 (4525). *Asian Recorder*, 7/2/94, pp. 24065-24066 (4525).

7/94

It is reported that India has begun to develop the Surya (Sun) ICBM at the Interim Test Range (ITR) Chandipur. Indian scientists, working at ITR and at DRDO laboratories in Delhi, are striving to finalize the design for the ICBM by 1995. The ICBM is reportedly an upgrade of the Agni-3 missile and will have a range of at least 12,000 km; it could be test-fired in 1996.

Asian Defense Journal, 7/94, p. 94 (4546).

Late 7/94

Bhuvanesh Chaturvedi, Minister of State in the Department of Atomic Energy and Space, tells the Indian Parliament that \$108 million has been approved by the government for testing the Cryogenic Upper Stage Project by the end of 1998, and says that within four years India will be able to build indigenously developed liquid-fuel rocket engines.

Washington Times, 7/30/94, p. A10 (4526).

Late 7/94

The Indian Army completes user trials of the Prithvi; as a result, production of the missile can begin.

International Defense Review, 9/94, p. 14 (4544).

8/94

It is reported that the Prithvi missile may have been deployed in static formation and that there are signs that the missile may be ready for launch from chosen sites on the Western border. This temporary deployment is expected to be a deterrent against Pakistan's 70 km range Hatf-1 and 280 km range Hatf-2 missiles, deployed in 1991 and 1993, respectively.

Asia-Pacific Defence Reporter, 8/94-9/94, p. 21 (4541).

8/1/94

India conducts successful user trials of its indigenously-produced Trishul short-range SAM. The Trishul is to form the "inner ring of an interlinked two-tier air defense system of the future," while the Akash SAM, which is still being tested, will form the outer ring.

Hindu, 8/13/94, p. 12 (4545).

9/94

It is reported that the second developmental launch of the Polar Satellite Launch Vehicle (PSLV-D2) planned for 10/94 has been delayed. The launch is scheduled to occur before the end of 1994, but monsoons may cause further postponements.

Flight International, 9/7/94, p. 40 (4543).

9/20/94

A malfunction in the Polar Satellite Launch Vehicle (PSLV) causes it to veer off course during its first launch attempt. The malfunction is attributed to a separation fault in the second and third stages; the PSLV's engines function very well.

Flight International, 8/3/94, p. 26 (4529).

INDIA WITH MULTI-COUNTRY GROUP

8/29/94-9/1/94

A four-nation group of representatives from the MTCR visit India and Pakistan to discuss the objectives of the regime in regards to missile developments in the region. The delegates from Australia, Switzerland, the U.S., and the U.K. begin what they describe as "the first stage in a dialogue." The team's discussions with India on 8/29-8/30 cover the Prithvi and Agni programs. Pakistan's Hatf-1 and Hatf-2 programs, and possibly the Chinese transfer of M-11s to Pakistan, are discussed during the team's meetings with Pakistan on 9/1-9/2. Pakistan informs the delegates that it supports a missile-free South Asia, but that India's development and deployment of missiles could spur a nuclear arms race in the region. According to Indian defense sources, the MTCR team does not bring up the issue of India discontinuing its missile program.

Tahir Ikram, Reuter; in Executive News Service, 9/2/94 (4535). *Flight International*, 9/21/94, p. 18 (4537).

INDIA WITH PAKISTAN

6/4/94

Pakistan states that India's test firing of the Prithvi has started a weapons race in South Asia. Munir Akram, a spokesman of the Pakistan Foreign Office, states that this test

ensures that all major Pakistani cities, except Quetta in the far south, are within range of Indian missiles. Munir states that Indian deployment of such missiles will give Pakistan only a few minutes warning time if a surprise attack takes place, "and, therefore, increase the hair-trigger environment in South Asia."

News (Islamabad), 6/15/94, p. 1; in FBIS-NES-94-108, 6/6/94, p. 81 (4533).

8/14/94

Pakistani Prime Minister Benazir Bhutto makes a statement critical of the Indian deployment of Trishul, Prithvi, and Agni missiles and India's "race" for weaponry. During her Independence Day speech, Bhutto states that both Pakistan and India should follow a "zero-missile regime"; that is, neither country should possess any missiles.

Ranjit Kumar, *Navbharat Times* (Delhi), 8/17/94, p. 7; in JPRS-TND-94-107, 9/8/94, p. 19 (4524). K. K. Katyal, *Hindu*, 8/27/94, p. 5 (4324).

8/15/94

In his Independence Day address from the Red Fort in Delhi, Indian Prime Minister P. V. Narasimha Rao asks why India's missile program is receiving so much attention while Pakistan's acquisition of "off-the-shelf" nuclear weapons is not addressed. Rao states that India will not put a stop to "its defense preparedness" and will not halt either the development or the deployment of its missiles.

Ranjit Kumar, *Navbharat Times* (Delhi), 8/17/94, p. 7; in JPRS-TND-94-107, 9/8/94, p. 19 (4524). K.K. Katyal, *Hindu*, 8/27/94, p. 5 (4324).

INDIA WITH PRC

9/7/94-9/13/94

Chinese Minister of Defense General Chi Haotian leads a delegation to India for discussions on bilateral defense relations. The meetings are unsuccessful and key issues remain unresolved, including China's sale of M-11 missiles to Pakistan, which India is interested in discussing with the Chinese. The negotiations also include discussion on joint Chinese-Indian space exploration.

Vivek Raghuvanshi, *Defense News*, 9/19/94, p. 34 (4538).

INDIA WITH RUSSIA

6/94

It is reported that Russia has announced its commitment to provide the spare parts for military equipment India had purchased from the Soviet Union and called for greater trade between the two countries. In addition, Russian Deputy Prime Minister Youri [sic] Yarov says that the problems with the cryogenic engine deal between Russia and India will be sorted out because Russia considers it important for the two countries to maintain good relations.

Hindu, 6/18/94, p. 5 (4388).

7/31/94

It is reported that the Indian army may purchase Tunguska air defense systems from Russia. The Indian Defence Research and Development Organisation (DRDO) is against the purchase as it wants to produce its indigenously built Trishul SAM as early as possible, and "buying the Russian system would pull the plug on funds."

Sudeep Chakravarti and Sunil Dasgupta, *India Today*, 7/31/94, pp. 30-35 (4334).

INDIA WITH UKRAINE

9/16/94

According to Andrey Zhalko-Titarenko, acting Director General of the Ukraine Space Agency, Ukraine and India sign a space agreement to cooperate in the areas of space technology and the remote probing of the Earth. Zhalko-Titarenko states that there is a provision in the agreement for the use of Indian boosters to launch Ukrainian satellites and the reciprocal use of space facilities. The U.S. is concerned that rocket technologies that fall under the MTCR may be transferred to India. Ukraine, according to Zhalko-Titarenko, has assured the U.S. that the agreement does not have any "military applications."

Pavlo Balkovsky, *Reuter*, 9/18/94 (4548). *Interfax* (Moscow), 9/20/94; in FBIS-SOV-94-183, 9/21/94, p. 60 (4534). *Hindu*, 9/24/94, p. 16 (4542). *Space News*, 9/26/94, p. 2 (4542).

IRAN

IRAN WITH NORTH KOREA

6/94

The Director of U.S. Naval Intelligence (DNI) Rear Admiral Edward D. Shaefer, Jr., releases a posture statement, which, among other things, indicates that Iran may not yet be in possession of No-dong missiles. He states, "Iranian acquisition of the No-dong system from North Korea is possible in the future." According to CIA Director R. James Woolsey, North Korean plans to sell Iran the No-dong missile have not been carried out.

Jon B. Wolfsthal and Dunbar Lockwood, *Arms Control Today*, 7/94, p. 23 (4359). Barbara Starr, *Jane's Defence Weekly*, 8/6/94, pp. 4-6 (4481).

6/94

U.S. officials reportedly state that Iranian officials have recently been present at a number of missile tests in North Korea which the U.S. describes as "sales demonstrations."

Bill Gertz, *Washington Times*, 6/8/94, pp. A1, A9 (4367).

6/14/94

U.S. Assistant Secretary of State Robert Pelletreau testifies before the House Foreign Relations Committee that, "North Korea has in the past delivered Scud-Bs and Scud-Cs, primarily to Iran and Syria." Pelletreau adds, "We're concerned about press reports and other intelligence that they might, at some point, sell the No-dong missile—with a much longer range than the Scud-B and -C." According to intelligence and nonproliferation sources, since 1988 North Korea has delivered 200-300 "knock-down" kits of Scud-B missiles to Iran, where they were assembled at a plant near Isfahan. Since 1992, these sources say, 150 completed Scud-Cs have been delivered. North Korean experts are in Iran attempting to extend the range of the Scud missiles. According to intelligence sources, North Korea may test its No-dong-1 missile in Iran

within six to 12 months because "[t]esting facilities don't exist for a full-range test [of the No-dong-1] in North Korea," and because it wants to avoid increasing the existing tension over the nuclear issue.

Martin Sieff, *Washington Times*, 6/16/94, p. A13 (4363). James Bruce, *Jane's Defence Weekly*, 7/30/94, pp. 23-33 (4569).

7/94

It is reported that Iran is funding North Korea's development of the 1,000 km range No-dong missile in hopes of obtaining an extended-range ballistic missile capability.

James Bruce, *Jane's Defence Weekly*, 7/30/94, pp. 23-33 (4569).

9/4/94

U.S. Administration sources reveal that U.S. Assistant Secretary of State Robert Gallucci and Israeli Foreign Ministry Deputy Chief Eytan Bentzur had discussed cooperative arrangements to forestall North Korean exports of the No-dong-1 and -2 missiles to Iran. Since 1993, Iran has been negotiating for the purchase of either No-dong-1 and -2 missiles or their manufacturing technology. Libya and other Middle Eastern countries were also interested in the No-dong missiles.

Yi Sang-sok, *Chungang Ilbo*, 9/6/94, p. 1; in FBIS-EAS-94-172, 9/6/94, p. 60 (4364).

IRAN WITH PRC

7/94

U.S. Pentagon officials state that China is ready to deliver 10 fast-attack missile boats and an "undisclosed number" of 83 km range anti-ship missiles to Iran.

Elaine Sciolino, *New York Times*, 7/5/94, p. A1 (4571).

IRAQ

IRAQ WITH GERMANY

7/19/94

German businessman Anton Eyerle, owner of Rhein-Bayern Fahrzeugbau, is sentenced to five-and-a-half years imprisonment because his firm continued to deliver missile components to Iraq after the invasion of Kuwait in 8/90. The firm supplied more than 1,000 ignition systems for Iraqi Styx and Scud missiles.

International Herald Tribune, 7/20/94 (4600).

IRAQ WITH UNITED NATIONS

6/11/94

U.S. President Clinton reports to Congress that UNSCOM has destroyed Iraq's missile launchers in Baghdad, missile support facilities, and a large portion of Iraq's missile manufacturing capability. Clinton also states that "serious gaps remain in Iraq's missile and weapons of mass destruction program and the destruction process for all designated Iraqi weapons is not yet complete."

Statesman (Calcutta); in *Asian Recorder*, 7/2/94, p. 24068 (4395).

6/14/94

An UNSCOM missile inspection team led by Patrice Palanque of France begins a four-day missile inspection of Iraq. The mission is the 25th ballistic missile inspection and the 81st inspection since the end of the Gulf War.

Leon Barkho, *Reuter*, 6/14/94 (4322).

6/24/94

U.N. arms experts complete a 15-day inspection during which they tagged missiles and inspected missile production sites. The leader of the mission, Mark Silver, does not say how many missiles had been tagged, but does say that all of the tagged missiles had been declared by Iraq. The tagged missiles have ranges between 50 and 149 km, and

were tagged to ensure that they will not be modified to ranges greater than the 150 km allowed under the terms of the Gulf War ceasefire. The most dangerous and difficult task is tagging operational missiles, which were ready to launch as the U.N. experts worked around them. In addition to the tagging, Silver made four scheduled and three surprise inspections of Iraqi missile production sites near Baghdad.

Leon Barkho, *Reuter*, 6/24/94; in *Executive News Service*, 6/24/94 (4314).

7/15/94

A multinational team of 10 U.N. inspectors led by German Norbert Reinecke flies to Baghdad on a planned 10-day inspection mission to examine Iraq's missile research and development program. The team is to lay the foundation for long-term monitoring to ensure that Iraq does not revive weapons programs banned by the U.N. Security Council.

Washington Times, 7/20/94, p. A15 (4320).

8/94

UNSCOM Chairman Rolf Ekeus states that "satisfactory progress" has been made with regard to the monitoring of Iraqi nuclear facilities and its weapons production programs.

Rym Brahimi, *UPI*, 8/31/94 (4321).

9/23/94

U.S. CIA Director James Woolsey contradicts an UNSCOM finding that Iraq's Scud missiles and chemical weapons have been destroyed; Woolsey accuses Saddam Hussein's regime of "still hiding Scud missiles, chemical munitions, and its entire biological weapons warfare program."

Patrick Worsnip, *Reuter*, 9/26/94 (4477).

IRAQ WITH UNITED STATES

9/15/94

A Jordanian-born, naturalized U.S. citizen, Al M. Harb, is convicted of circumventing the U.S. trade embargo on Iraq. Harb illegally procured and exported technology, machinery, spare parts, and other goods which experts say were probably intended for military use in the Iraqi government's

effort to rebuild advanced weapons systems. Harb was convicted of 23 counts relating to the illegal shipping operation.

Daniel Southerland, *Washington Post*, 9/17/94, p. C5 (4598).

ISRAEL

INTERNAL DEVELOPMENTS

8/94

The Israeli Navy and Israel Aircraft Industries (IAI) have begun development of a replacement for the Gabriel Mk-2 sea-skimming anti-ship missile. With a 36 km maximum range, the Gabriel Mk-2 has a launch weight of 520 kg, including the 150 kg warhead. The Israeli Navy wants the replacement of the Gabriel Mk-2 to have a greater range, as well as greater accuracy and lethality.

Flight International, 8/10/94, p. 14 (4473).

9/94

An undisclosed South American country is reportedly the first customer for a battlefield air-defense version of the Israeli-built Barak naval SAM. The Barak missile, designed by Israel Aircraft Industries (IAI) and Rafael Armament Development Authority, has a maximum range of 10 km against fixed-wing aircraft or high-speed sea-skimming targets, and weighs 98 kg. The Barak's command-to-line-of-sight guidance system will be adapted by Rafael to operate with the fire control radar used by the customer.

International Defense Review, 9/94, p. 21 (4464).

ISRAEL WITH NORTH KOREA

Mid 6/94

Israeli ambassador to South Korea Na'im Asher says that North Korea is selling long-range Scud ballistic missiles to several countries in the Middle East, including Syria, Iran, and Libya. Asher says that Israeli efforts to persuade North Korea to halt its

missile exports to the Middle East have not met with success, and that U.S. efforts to have sanctions implemented against North Korea would be in Israel's interest.

KBS-1 Radio Network (Seoul), 6/19/94; in JPRS-TND-94-014, 7/13/94, p. 56 (4411).

ISRAEL WITH RUSSIA

9/94

Russian Space Agency Director General Yuri Koptev meets with Israeli Space Agency Chairman Yuval Ne'eman to discuss possible launcher and satellite cooperation between the two countries. Israeli sources report that Koptev broached the possibility of Russia launching Israeli satellites and inspected Israeli space facilities. Ne'eman and Koptev sign an agreement to encourage scientific and commercial space contacts.

Space News, 9/5/94, p. 2 (4476).

ISRAEL WITH SYRIA

6/22/94

In a speech to the Zionist General Council, Israeli Prime Minister Yitzhak Rabin says that "Syria today has ground-to-ground missiles in quantity and in quality that [make] what we suffered from Iraq in the gulf war [seem like] a children's game." Opposition leaders denounce Rabin for attempting to frighten opponents into advocating an extensive withdrawal from the Golan Heights.

Sharone Parnes, *Defense News*, 6/27/94, p. 16 (4335).

ISRAEL WITH UNITED STATES

5/94

Israel, Greece, and Japan finalize a \$43.4 million Foreign Military Sales contract with the U.S. Loral Vought Systems for the purchase of Multiple Launch Rocket Systems (MLRS) and rockets. By 9/95, Japan will receive 72 practice rockets; by 12/96, Israel will receive 6 MLRS launchers, 726 tactical rockets, and 720 practice rockets; and by 2/97, Greece will take delivery of 9 MLRS launchers and 132 reduced-range practice rockets.

International Defense Review, 8/94, p. 17 (4466).

5/26/94

The Israeli Home Front Command, with U.S. cooperation, detonates a Scud-like missile in a southern Israeli open training range scattered with reinforced structures. The missile, which is similar to Scuds owned by Syria and other Arab countries, contains hundreds of kilograms of explosives; the experiment is designed to study the impact a Scud would create falling into a densely populated area.

Arye Kiesel, *Yedi'ot Aharonot*, 5/27/94, p. 17; in FBIS-NES-94-124, 5/28/94, p. 54 (4478).

6/94

It is reported that Lt. Gen. Malcolm O'Neill, Director of the U.S. Ballistic Missile Defense Organization (BMDO), said that there must be a successful intercept test by the Israeli Arrow missile before the U.S. will provide \$25 million in funding that has already been earmarked for deployment technology R&D or participate in any program to deploy the Arrow. To date, the U.S. and Israel have been jointly developing the Arrow missile under the \$330 million Arrow Continuation Experiments (ACES) program, of which the U.S. funds 75 percent.

Barbara Starr, *Jane's Defence Weekly*, 6/4/94, p. 4 (4496).

6/12/94

The Israeli Arrow Continuing Experiments series (ACES) experiences its first major success when an Arrow-1 missile intercepts and destroys a dummy chemical warhead on the Palmachim range south of Tel Aviv. The U.S. provided 72 percent of the \$330 million in funding for Arrow development.

Defense Daily, 6/14/94, p. 403 (4568). Barbara Opall, *Defense News*, 6/20/94, p. 36 (4568). *JINSA Security Affairs*, 7/94, pp. 1, 8-9 (4469). Joseph Lovece, *Defense Week*, 7/5/94, p. 6 (4505). *International Defense Review*, 8/94, p. 15 (4568).

Late 6/94

An Israeli industry official states that the Arrow missile is comparable in efficiency to the U.S. Patriot PAC-3 system, and says that the Arrow will be deployed using only Israeli funds and that Israel will not sell the system to other countries. The Arrow system is planned for use in a two-tier missile defense, employing six canister-launched missiles, an Elta "Music" radar, and a Tadiran

battle control center to intercept targets up to an altitude of 35 mi.

Joseph Lovece, *Defense Week*, 7/5/94, p. 6 (4505).

7/94

It is reported that the Senate Armed Services Committee recommends that the U.S. continue cooperating with Israel on Theater Missile Defense (TMD), the Arrow ATBM, and the boost phase intercept technology program.

BMD Monitor, 7/1/94, p. 227 (4499).

7/94

Feasibility studies of Israel's boost-phase intercept (BPI) technologies are scheduled to be completed. The BPI system, known as the Israel Boost-Intercept System (IBIS), will be composed of long-range high endurance unmanned aerial vehicles (UAV). The UAVs will be equipped with sensors to detect a ballistic missile launch by an enemy. Once a launch is detected, the UAV will fire high-speed air-to-air missiles carrying infrared seekers to destroy the missile over enemy territory.

International Defense Review, 8/94, p. 15 (4568).

9/94

The U.S. Navy begins evaluating the Israeli Barak ship point-defense missile as a possible alternative to the Evolved Sea Sparrow Missile (ESSM), which is being developed by Hughes Missile Systems Co. and Raytheon Co. for an estimated cost of \$250 million. The Barak, which is being developed by Israel Aircraft Industries (IAI) and Rafael Armament Development Authority, is a vertically launched missile weighing 98 kg and has a range of 10 km (5.5 nm). The Barak is being designed to defend ships against high-speed, stealthy, sea-skimming targets.

Barbara Opall, *Defense News*, 9/26/94, p. 14 (4566).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

ITALY

ITALY WITH UNITED STATES

9/94

The U.S. Pentagon informs Congress of the proposed \$48 million sale of 42 Maverick missiles and 33 AIM-120 AMRAAMs to Italy.

International Defense Review, 9/94, p. 9 (4349).

JAPAN

INTERNAL DEVELOPMENTS

6/94

The "special committee on long-term vision," an advisory committee to the Japanese Space Activities Commission, gives a report recommending the development of an H-2 rocket capable of carrying double the payload of the current version.

David Swinbanks, *Nature*, 8/11/94 (4402).

6/13/94

The Director General of the Defense Policy Bureau of the Japanese Defense Agency tells the budget committee of the upper house of the Japanese Diet that "with our existing weapons system it would be difficult to deal with long-range ballistic missiles like [North Korea's] No-dong because the velocity of their descent is too rapid." The point is reiterated by Defense Agency minister Atsushi Kanada, who tells the committee, "Once a No-dong with a range of 1,000 km is developed, Japan's defenses will not be sufficient. We will have to install a large-scale air defense system."

Reuter, 6/14/94 (4348).

6/21/94

Japan's Institute of Space and Aeronautical Science (ISAS) successfully tests the first-stage M-14 engine for its 3-stage M-5 space launch vehicle. One report says the test lasts for 80 seconds and burns 71 tons of fuel; other reports list the test duration variously as 41 and 78 seconds. The solid-fuel M-14 engine, produced by Nissan, is 13.65 m long and 2.5 m in diameter, and is capable of 926,000 lbs thrust. It weighs 92,100 kg, and its control system utilizes a "gas-generator controlled, movable-nozzle thrust-vector." Japan plans to conduct "in-flight combustion tests" on the M-5 rocket's M-24 engine in fall 1994. Testing is planned in summer 1995 for a "flight-configured" prototype M-14 engine with high-tensile-steel casing and thinner, "more critical" nozzle material. The M-5 SLV's maiden flight from Kagoshima space center has been postponed until 1996 because of problems with extendable nozzles on the second and third stages. The M-5 SLV is 26 m long and can carry a payload of 2,000 kg into low-earth orbit, or a 520 kg payload destined for the moon or other planets. Planned payloads include a telescope, a lunar orbiter, and a Mars probe.

Washington Times, 6/24/94, p. A17 (4329). Paul Proctor, *Aviation Week & Space Technology*, 7/4/94, p. 17 (4329). *Flight International*, 7/20/94, p. 18 (4329).

6/30/94

Japan's new Defense Minister Tokuchiro Tamazawa states that an advisory panel will issue a recommendation for a Japanese missile defense system as part of a draft of Japan's basic defense strategy. A senior official from Japan's Defense Agency says that Theater Missile Defense (TMD) will be part of Japan's strategic plans. The official states, "We cannot afford not to study the system. The current Japanese defense is virtually useless to address ballistic missile threats."

Pat Cooper and Naoaki Usui, *Defense News*, 7/10/94, pp. 1, 28 (4407).

7/2/94

It is reported that Japan has launched its third hydrofoil missile boat, armed with four SSM-1B (Type 90) anti-ship missiles. The missile boat was put to sea by Japan's Maritime Self-Defense Force from the Sumitomo

Heavy Industries shipyard in Uruga, and is scheduled to enter service in 3/95.

Jane's Defence Weekly, 7/2/94, p. 12 (4327).

8/94

The Japanese newspaper *Mainichi Shimbun* releases a 100-page top secret Foreign Ministry report from 1969 entitled "Prerequisites of Japan's Foreign Policy." According to the report, the Foreign Ministry had decided to "ensure [Japan] had the financial and technical potential to make nuclear arms without producing them." *Mainichi Shimbun* reports that the Foreign Ministry believes that Japan is currently able to produce nuclear weapons, and critics believe that Japan could convert its indigenously produced SLV into a ballistic missile.

Eugene Moosa, *Washington Times*, 8/5/94, p. A14 (4344).

8/94

It is reported that Japan's National Space Development Agency (NASDA) has said that it will stress reusability in its future space vehicles. NASDA's proposed Fully Reusable Space Infrastructure plan includes the development of a shuttle vehicle and six reusable orbital transfer vehicles.

Eiichiro Sekigawa, *Aviation Week & Space Technology*, 8/8/94, pp. 64-65 (4457).

8/12/94

Recommendations by a top-level Japanese government panel are released. The panel urges Japan to utilize military reconnaissance satellites and to cooperate with the U.S. on creating a ballistic missile defense system to defend Japan against a "limited missile attack." The recommendations are to be used as the basis for the replacement of the Japan Defense Agency's 1976 "Outline of National Defense" by the end of 1994. Japan's Defense Agency has requested 20 million yen (\$200,000) for initial funding for TMD in its 1995 budget request.

Naoaki Usui, *Defense News*, 8/15/94, pp. 1, 29 (4351). Eiichiro Sekigawa, *Aviation Week & Space Technology*, 8/22/94, p. 59 (4459). Naoaki Usui, *Defense News*, 9/12/94, p. 10 (4453).

8/17/94

Japan cancels a scheduled launch of its H-2 rocket due to problems with a fuel valve.

Wall Street Journal, 8/19/94, p. A8 (4326). David Swinbanks, *Nature*, 8/25/94 (4326).

8/18/94

Japan's National Space Development Agency (NASDA) again aborts a scheduled launch of the H-2 rocket. The cancellation is caused by problems with a computer chip in the H-2's "ground-based launch control equipment," which cause the rocket's boosters to fail to fire. The H-2, which has a liquid-fuel main engine and solid-fuel booster engines, was to deliver a two-ton telecommunications satellite into geostationary orbit.

Wall Street Journal, 8/19/94, p. A8 (4326). Michael Mecham, *Aviation Week & Space Technology*, 8/22/94, p. 25 (4460). David Swinbanks, *Nature*, 8/25/94 (4326).

8/28/94

Japan successfully launches its H-2 space launch vehicle for the second time from the Tanegashima Space Center.

Washington Times, 8/29/94, p. A13 (4610). *New York Times*, 8/29/94, p. 2 (4610). Simon Mansfield, *Space News*, 9/5/94, p. 3 (4610).

9/94

It is reported that Japan's Science and Technology Agency (STA) requested about \$2.81 billion for its space programs for fiscal year 1995, a 9.1 percent increase from 1994. The STA's proposed programs include: the launches of the fourth H-2 and the first J-1 SLVs; development and launch of the HOPE-X unmanned mini-shuttle technology demonstrator; and other programs. The Ministry of International Trade and Industry (MITI) requested \$133.6 million for fiscal year 1995 for its space programs.

Eiichiro Sekigawa, *Aviation Week & Space Technology*, 9/19/94, p. 61 (4456).

9/3/94

The Socialist Democratic Party (SDP) declares Japan's military to be constitutional in a controversial vote. The controversial nature of the vote worries many Japanese officials who are advocating that Japan pursue development of a Theater Missile Defense (TMD) system, because many Socialists oppose joint development of a TMD system with the U.S.

Naoaki Usui, *Defense News*, 9/12/94, p. 16 (4458).

9/10/94

The Executive Director of NASDA, Tomifume Godai, responds to a 4/30/94 *Jane's Defence Weekly* article entitled "Ballistic Missiles Hit New Heights," arguing that Japan would not convert its civilian SLV technology into a ballistic missile capability. He states that NASDA's objective is to further space exploration, and points out that the Japanese Diet has decided that Japan's development of space should be for peaceful purposes only. Godai also argues that Japan's H-2 SLV could not be used as an ICBM because it cannot be launched in the short time available in an emergency or crisis situation.

Tomifume Godai, *Jane's Defence Weekly*, 9/10/94 (4343).

9/10/94

Japanese defense ministry sources publicize plans to integrate the radar networks of the air, ground, and maritime defense forces into a single comprehensive radar network to bolster defenses against potential North Korean missile attacks.

Reuter, 9/10/94; in Executive News Service, 9/13/94 (4370).

JAPAN WITH NORTH KOREA

6/94

It is reported that Japanese intelligence sources believe that the North Korean controlled Chongryun, the 250,000-member General Association of Korean Residents in Japan, secretly provides money and equipment, including powerful computers, to North Korea for its nuclear and missile development programs in violation of Japanese laws.

Edward W. Desmond and Hiroko Tashiro, *Time*, 6/13/94, p. 27 (4523).

7/15/94

The Japanese Defense Agency warns in its annual white paper that North Korean weapons programs are "a serious destabilizing factor." Japanese Defense Agency advisor Hirotsu Ota says that Japan currently has no "contingency plans" for defense against a North Korean attack, but that "measures would be considered" if North Korea con-

tinues its missile development program. The white paper notes that North Korea is nearing final development of its 1,000 km range No-dong-1 missile, and developing even longer range systems.

William Dawkins, *Financial Times*, 7/16/94 (4358).

JAPAN WITH UNITED STATES

5/94

Israel, Greece, and Japan finalize a \$43.4 million Foreign Military Sales contract with the U.S. Loral Vought Systems for the purchase of Multiple Launch Rocket Systems (MLRS) and rockets. By 9/95, Japan will receive 72 practice rockets; by 12/96, Israel will receive 6 MLRS launchers, 726 tactical rockets, and 720 practice rockets; and by 2/97, Greece will take delivery of 9 MLRS launchers and 132 reduced-range practice rockets.

International Defense Review, 8/94, p. 17 (4466).

5/94

Japan signs a \$50 million contract with U.S. Loral Vought Systems for an additional 9 MLRS launchers (5 assembled and 4 partially assembled) to be delivered to Japan's Nissan Aerospace division of the Nissan Motor Company by 8/96.

Jane's Defence Weekly, 6/25/94, p. 13 (4466).

6/94

U.S. Ballistic Missile Defense Organization (BMDO) Director Lt. Gen. Malcolm O'Neill gives his Japanese counterparts a briefing entitled "Ballistic Missile Defense: Options for Japanese TMD" in which four options for Japanese ballistic missile defense are outlined. Japan's present plan includes the deployment of 24 Patriot PAC-2 units that are to be operational by 1999 and up to four Aegis destroyers and four AWACS aircraft that are to be operational by 1998. Missile defense option A would cost \$4.5 billion and would use Aegis destroyers in concert with Patriot PAC-3 land-based units to engage targets in the upper and lower tiers, respectively. Option B would cost \$16.3 billion and would include Patriot PAC-3 units, eight new Aegis destroyers, and a new radar system situated west of Tokyo. Option C would cost \$4.55 billion and would

employ six land-based THAAD firing units and the Patriot PAC-3, for a combined total of 560 missiles. Option D would cost \$8.9 billion and would include five THAAD firing units, upgraded Patriot missiles, and four Aegis destroyers. Each of the Aegis destroyers would carry 36 ATBMs; one would be stationed in the Sea of Japan, one off Kyushu, and the remaining two held in reserve.

Paul Beaver, *Jane's Defence Weekly*, 8/13/94, p. 21 (4350).

6/94

Japan considers a U.S. proposal for cooperation on Theater Missile Defense (TMD). Via the program, the U.S. hopes to gain access to Japanese radar circuit production technology, "advanced materials" to produce lightweight rockets, and cooperation in the production of an optoelectronic guidance system for ATBMs.

Daily Japan Digest, 6/20/94 (4339).

6/8/94

Meetings commence in Tokyo between Japan and a team from the U.S. Pentagon's Ballistic Missile Defense Organization (BMDO), headed by David Martin. The U.S. is seeking to jointly develop a two-phase sea-based tactical missile defense system with Japan, at an estimated cost of \$85 million, using Aegis ships and upgrades of the U.S. Standard SAM. The first "Navy Lower-Tier" phase includes Aegis upgrades and slight changes in the Standard missile. The second "Navy Upper-Tier" phase would augment the Standard missile with a kinetic kill vehicle to intercept missiles at higher altitudes.

Barbara Opall and Naoaki Usui, *Defense News*, 6/6/94, pp. 1, 42 (4400).

9/94

McDonnell Douglas is awarded an \$125 million contract by the U.S. Navy for 75 SLAMs and 44 Harpoon missiles. Of the 44 Harpoon missiles currently covered by the deal, Egypt will receive 16, Japan 3, and Malaysia 25. Work on the contract is expected to be completed by 12/96.

Reuter, 8/22/94; in Executive News Service, 8/24/94 (4347). *Flight International*, 9/14/94, p. 40 (4347).

9/10/94

It is reported that the Japan Defence Equipment Association will establish a "joint research committee" by the end of 1994 to examine the Theater Missile Defense (TMD) system, in order to "coordinate activities already underway." The cost of the proposed TMD system could exceed \$20 billion.

Jane's Defence Weekly, 9/10/94, p. 16 (4341).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

KAZAKHSTAN

KAZAKHSTAN WITH RUSSIA

6/94

It is reported that Kazakh National Space Agency Director Aisultan Kalybayev has said that a draft treaty calling for Russia to pay Kazakhstan \$115 million a year for use of the Baykonur Cosmodrome is in compliance with a 3/28/94 agreement signed by Russian President Boris Yeltsin and Kazakh President Nursultan Nazarbayev. Russia will rent the launch pads and buildings located in the Kazakh town of Leninsk for a term of 20 years, which can be extended for another 10-year period. The municipal council in Leninsk expressed concern over the future of the Baykonur Cosmodrome. It has supported an appeal made by several of its members to the Kazakh Supreme Soviet about the lack of a mechanism for implementing the agreement signed by Russia and Kazakhstan on the use of Baykonur.

Interfax (Moscow), 6/8/94; in FBIS-SOV-94-111, 6/9/94, p. 64 (4422). Vladimir Akimov, Itar-Tass (Moscow), 6/10/94; in FBIS-SOV-94-113, 6/13/94, p. 70 (4421).

KUWAIT

KUWAIT WITH RUSSIA

6/94

Kuwait welcomes a high-level Russian military delegation to conclude a substantial weapon systems sale. Kuwait is intent on buying the S-300/S-300V (SA-10 "Grumble"/SA-12 "Gladiator") and TOR M-1 (SA-15 "Gauntlet") SAMs. Kuwait may also buy BMP-2s and -3s, as well as five S-300 systems which could be integrated into its air defense system beside its U.S.-built Patriot missiles.

James Bruce, *Jane's Defence Weekly*, 7/9/94, p. 1 (4467).

8/8/94

An official of Rosvooruzheniye, a Russian state-owned arms trading company, announces a contract for Kuwait's purchase of 27 300mm, twelve-round BM 9A52-2 Smerch multiple rocket launch systems.

Stephen Foye, *RFE/RL News Briefs*, 8/8/94, p. 3 (4470). Viktor Litovkin, *Izvestiya* (Moscow), 8/11/94, p. 2; in FBIS-SOV-94-157, 8/15/94, p. 10 (4470). Christopher F. Foss and James Bruce, *Jane's Defence Weekly*, 8/20/94, p. 21 (4582).

8/29/94

It is reported that Russia is close to concluding a deal to sell an SA-12 missile defense system to Kuwait. Once the SA-12 is integrated with the U.S.-built Patriot anti-missile systems, Kuwait will have the only two-tier missile defense system outside of Russia. However, Russia's Rosvooruzheniye said that Kuwait has not yet ordered the system. Kuwait's Defense Minister, Sheik Ahmed Mahud Sabah Ahmed, has indicated that Kuwait may be interested in buying the SA-10, the SA-12, and the SA-15.

Christopher F. Foss and James Bruce, *Jane's Defence Weekly*, 8/20/94, p. 21 (4582). *Washington Times*, 8/29/94, p. A16 (4455). Christopher F. Foss and James A. Bruce, *Washington Times*, 9/21/94, p. A11 (4582).

MALAYSIA

MALAYSIA WITH UNITED STATES

9/94

McDonnell Douglas is awarded an \$125 million contract by the U.S. Navy for 75 SLAMs and 44 Harpoon missiles. Of the 44 Harpoon missiles currently covered by the deal, Egypt will receive 16, Japan 3, and Malaysia 25. Work on the contract is expected to be completed by 12/96.

Reuter, 8/22/94; in Executive News Service, 8/24/94 (4347). *Flight International*, 9/14/94, p. 40 (4347).

MOLDOVA

MOLDOVA WITH RUSSIA AND YEMEN

6/20/94

According to Moldovan news sources, the Moldovan Ministry of Defense sells four MiG-24s and seven missile launchers, worth a total of \$40 million, to Yemen via Rosvooruzheniye, a Russian state arms company.

Itar, 8/23/94 (4376).

NORTH KOREA

INTERNAL DEVELOPMENTS

5/94

According to U.S. officials, North Korea begins shielding the simulators for the Taep'o-dong-1 and -2 at the Sanum Dong Missile Research and Development facility

to hinder attempts at detection.

Barbara Starr, *Jane's Defence Weekly*, 6/25/94, p. 10 (4410).

6/94

According to U.S. CIA Director R. James Woolsey, the CIA will continue to monitor North Korea's nuclear program, and the "potential exports" of nuclear warheads and Scud, No-dong, and Taep'o-dong missiles. Woolsey states that at present, these technologies are not ready for export, although they could earn North Korea hard currency in the future.

Barbara Starr, *Jane's Defence Weekly*, 8/6/94, pp. 4-6 (4481).

6/94

Director of U.S. Naval Intelligence (DNI) Rear Admiral Edward D. Shaefer, Jr. releases a posture statement, which suggests that North Korea's 1,000 km range No-dong-1 SSM, in addition to being chemical and conventional warhead capable, may also be nuclear capable by the year 2000. While this is the accepted deployment date, the report notes that "some authorities believe" that the missile could be nuclear capable by 1995. The posture statement further states that the Taep'o-dong SSM "is still in the initial research phase and is not expected to become operational until the early 2000s."

Barbara Starr, *Jane's Defence Weekly*, 6/18/94, p. 1 (4359). Jon B. Wolfsthal and Dunbar Lockwood, *Arms Control Today*, 7/94, p. 23 (4359).

6/94

It is reported that increased activity at North Korea's missile launch and support sites has private and governmental North Korea experts convinced that the country is preparing to test its No-dong missile to verify the system's flight characteristics.

Paul Mann, *Aviation Week & Space Technology*, 6/20/94, p. 19 (4428).

6/9/94

South Korean Defense Minister Rhee Byoung-tae, in a report to the South Korean parliament, states that since early 5/94 North Korea had been preparing to test launch the Taep'o-dong missile, which has a range of more than 1,000 km.

Reuter, 6/9/94, in Executive News Service, 6/9/94, (4361).

6/9/94

North Korean Foreign Minister Kim Yong-nam tells reporters at Kiev airport after a visit to Ukraine that North Korea will continue to test-launch missiles, stating, "Missile launches occur in any country regularly, and the United States and Japan do this most often. Until now, no one ever mentioned anything about our launches of experimental missiles. We don't understand why there is so much noise about it now."

Reuter, 6/9/94; in Executive News Service, 6/9/94 (4368).

6/14/94

According to the 7/1/94 early edition of the South Korean newspaper *Chosen Ilbo*, North Korea conducts its first test on the engine for its new ballistic missiles, the Taep'o-dong-1 and Taep'o-dong-2, at its North Hamgyong Province missile testing site. The Taep'o-dong missile is a continuation of the No-dong-1 and is currently in the testing stage of development. It is estimated that the Taep'o-dong has a range of over 2,000 km. According to *Chosen Ilbo*, the tests are detected by U.S. spy satellites, and indicate that the speed of development of the Taep'o-dong is quicker than first thought. According to some U.S. intelligence estimates, the Taep'o-dong-1 could be operational by 1996, and the Taep'o-dong-2 by 2000.

Barbara Starr, *Jane's Defence Weekly*, 6/25/94, p. 10 (4410). *Yomiuri Shimbun* (in Japanese), 7/2/94 (4412).

6/20/94

William J. Taylor, Jr., Senior Vice President at the Center for Strategic and International Studies, writes in an editorial that North Korea is in possession of approximately 100 SSMs and "deliverable chemical, and probably, biological weapons."

William J. Taylor, Jr., *Washington Times*, 6/20/94, p. A20 (4369).

7/94

It is reported that a Russian satellite took detailed images of North Korea's missile testing facility in Taep'o Dong, in the North Hamgyong Province. The facility includes three missile launch sites, a rocket engine test stand and platform, missile construction and maintenance facilities, and docks

for missile tracking ships.

Kyodo News Service, 5/9/94 (4498). *Aviation Week & Space Technology*, 7/11/94, p. 55 (4498).

7/27/94

North Korean defector Kang Myong-do accuses North Korea of carrying out negotiations on its nuclear program with the intent of stalling to allow time to build missiles to carry nuclear warheads. Kang says that North Korea had already built five nuclear "bombs" and intends to build an additional five.

Times Record, 7/29/94, p.8 (4356).

8/94

It is reported that the U.S. Defense Intelligence Agency (DIA) told the Senate Select Committee on Intelligence that North Korea, regardless of any agreements, will continue to develop nuclear weapons. According to the DIA, a ballistic missile is North Korea's preferred delivery system; its Scud and No-dong missiles can target all of South Korea and parts of Japan, China, and Russia.

James R. Asker, *Aviation Week & Space Technology*, 8/15/94, p. 19 (4461).

9/26/94

The South Korean news agency Yonhap cites a Unification Ministry report submitted to the National Assembly which states that North Korea is capable of producing 100-150 Scud-B and -C missiles per year, and "was expected to complete development" of its 1,500-2,000 km range, No-dong-2 missile by the end of 1995. The report states that, because of the growing economic disparity between North and South Korea, the North is no longer able to maintain its military edge and has thus resorted to "developing long-range guided missiles and biological and chemical weapons."

Reuter, 9/26/94 (4357). *Washington Times*, 9/27/94, p. A20 (4357).

NORTH KOREA WITH IRAN

6/94

The Director of U.S. Naval Intelligence (DNI) Rear Admiral Edward D. Shaefer, Jr. releases a posture statement, which, among

other things, indicates that Iran may not yet be in possession of No-dong missiles. He states, "Iranian acquisition of the No-dong system from North Korea is possible in the future." According to CIA Director R. James Woolsey, North Korean plans to sell Iran the No-dong missile have not been carried out.

Jon B. Wolfsthal and Dunbar Lockwood, *Arms Control Today*, 7/94, p. 23 (4359). Barbara Starr, *Jane's Defence Weekly*, 8/6/94, pp. 4-6 (4481).

6/94

U.S. officials reportedly state that Iranian officials have recently been present at a number of missile tests in North Korea which the U.S. describes as "sales demonstrations."

Bill Gertz, *Washington Times*, 6/8/94, pp. A1, A9 (4367).

6/14/94

U.S. Assistant Secretary of State Robert Pelletreau testifies before the House Foreign Relations Committee that, "North Korea has in the past delivered Scud-Bs and Scud-Cs, primarily to Iran and Syria." Pelletreau adds, "We're concerned about press reports and other intelligence that they might, at some point, sell the No-dong missile—with a much longer range than the Scud-B and -C." According to intelligence and nonproliferation sources, since 1988 North Korea has delivered 200-300 "knock-down" kits of Scud-B missiles to Iran, where they were assembled at a plant near Isfahan. Since 1992, 150 completed Scud-Cs have been delivered. It is reported that Iran is funding North Korea's development of the 1,000 km range No-dong missile with hopes of achieving an extended-range ballistic missile capability. North Korean experts are in Iran attempting to extend the range of the Scud missiles. According to intelligence sources, North Korea may test its No-dong-1 missile in Iran within 6-12 months because "[t]esting facilities don't exist for a full-range test [of the No-dong-1] in North Korea," and because it wants to avoid increasing the existing tension over the nuclear issue.

Martin Sieff, *Washington Times*, 6/16/94, p. A13 (4363). James Bruce, *Jane's Defence Weekly*, 7/30/94, pp. 23-33 (4569).

NORTH KOREA WITH ISRAEL

Mid 6/94

Israeli Ambassador to South Korea Na'im Asher says that North Korea is selling long-range Scud ballistic missiles to several countries in the Middle East, including Syria, Iran, and Libya. Asher says that Israeli efforts to persuade North Korea to halt its missile exports to the Middle East have not met with success, and that U.S. efforts to have sanctions implemented against North Korea would be in Israel's interest.

KBS-1 Radio Network (Seoul), 6/19/94; in JPRS-TND-94-014, 7/13/94, p. 56 (4411).

NORTH KOREA WITH JAPAN

6/94

It is reported that Japanese intelligence sources believe that the North Korean controlled Chongryun, the 250,000-member General Association of Korean Residents in Japan, secretly provides money and equipment, including powerful computers, to North Korea for its nuclear and missile development programs in violation of Japanese laws.

Edward W. Desmond and Hiroko Tashiro, *Time*, 6/13/94, p. 27 (4523).

7/15/94

The Japanese Defense Agency warns in its annual white paper that North Korean weapons programs are "a serious destabilizing factor." Japanese Defense Agency advisor Hirotsu Ota says that Japan currently has no "contingency plans" for defense against a North Korean attack, but that "measures would be considered" if North Korea continues its missile development program. The white paper notes that North Korea is nearing final development of its 1,000 km range No-dong-1 missile, and developing even longer range systems.

William Dawkins, *Financial Times*, 7/16/94 (4358).

NORTH KOREA WITH UNITED STATES

6/29/94

Assistant Secretary of State Robert Gallucci, commenting on the upcoming 7/8/94 talks with North Korea in Geneva, states, "We

would like to see the North Koreans adjust their missile technology export policy and also their development policy." Gallucci adds, "If the dialogue fails and if the DPRK does not prove willing to take the necessary steps to resolve issues, we will return again to the Security Council."

Sid Balman Jr., UPI, 6/29/94 (4366).

NORTH KOREA WITH YEMEN

6/8/94

Yemeni President Ali Abdullah Saleh states that North Korea has agreed to sell missiles to the southern side in Yemen's civil war. Saleh, who leads the northern forces, said, "Now we have received confirmation about a new contract of MiG-29 (jets) and a number of T-82 (tanks) and tactical missiles contracted with North Korea."

Reuter, 6/13/94; in Executive News Service, 6/13/94 (4429).

6/13/94

In response to Yemeni President Ali Abdullah Saleh's statement concerning a contract with North Korea for weapons, including tactical missiles, an unidentified North Korean Foreign Ministry spokesman tells the [North] Korean Central News Agency (KCNA) that the accusation was "... an utterly groundless fabrication."

Reuter, 6/13/94; in Executive News Service, 6/13/94 (4429).

NORWAY

INTERNAL DEVELOPMENTS

6/8/94

Norway tests four of its 20-year-old surface-to-surface Penguin missiles; three fell short of the target and the fourth failed to launch. The Penguin missile test, which was the first in 12 years, prompted the Norwegian Navy to reassess its deployment of the Penguins.

Reuter, 6/8/94; in Executive News Service, 6/8/94 (4436).

PAKISTAN

INTERNAL DEVELOPMENTS

5/15/94

According to Pakistan's Chief of Naval Staff Admiral Saeed Khan, Pakistan's submarine fleet is armed with Harpoon missiles.

Nation (Islamabad), 5/16/94, pp. 1, 4; in JPRS-TND-94-012, 6/7/94, p. 15 (4426).

PAKISTAN WITH FRANCE

9/21/94

France and Pakistan sign a \$950 million deal that includes three Agosta 90-B submarines and the transfer of technology. The deal also includes training and long-term logistical support, and reportedly gives the Pakistani Navy "offensive capabilities far superior to those of most non-NATO navies." The submarines are equipped with Air-Independent Propulsion (AIP) and are armed with torpedoes and SM-39 Exocet anti-ship missiles. The Exocets can be fired while a submarine is submerged.

Jawed Naqvi, Reuter, 9/23/94 (4331). Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

9/23/94

A senior French defense official states that Pakistan feels that "the combination of AIP and SM-39s will give [Pakistan] a very cost-effective anti-blockade deterrent" against the Indian Navy during a conflict. According to an official of the French Defense Procurement Agency (DGA), the first of the three Agosta submarines will be delivered to Pakistan by late 1998. The first submarine will be built completely in France, the second will be assembled in Pakistan after being partially built in France, and the third will be built entirely in Pakistan. The work in Pakistan on the second and third submarines will be done at the Karachi Naval Shipyards.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

PAKISTAN WITH INDIA

6/4/94

Pakistan states that India's test-firing of the Prithvi has started a weapons race in South Asia. Munir Akram, a spokesman of the Pakistan Foreign Office, states that this test ensures that all major Pakistani cities, except Quetta in the far south, are within range of Indian missiles. Munir states that Indian deployment of such missiles will give Pakistan only a few minutes warning time if a surprise attack takes place, "and, therefore, increase the hair-trigger environment in South Asia."

News (Islamabad), 6/15/94, p. 1; in FBIS-NES-94-108, 6/6/94, p. 81 (4533).

8/14/94

Pakistani Prime Minister Benazir Bhutto makes a statement critical of the Indian deployment of Trishul, Prithvi, and Agni missiles and India's "race" for weaponry. During her Independence Day speech, Bhutto states that both Pakistan and India should follow a "zero-missile regime," that is, neither country should possess any missiles.

Ranjit Kumar, *Navbharat Times* (Delhi), 8/17/94, p. 7; in JPRS-TND-94-107, 9/8/94, p. 19 (4524). K. K. Katyal, *Hindu*, 8/27/94, p. 5 (4324).

8/15/94

In his Independence Day address from the Red Fort in Delhi, Indian Prime Minister P. V. Narasimha Rao asks why India's missile program is receiving so much attention while Pakistan's acquisition of "off-the-shelf" nuclear weapons is not addressed. Rao states that India will not put a stop to "its defense preparedness" and will not halt either the development or the deployment of its missiles.

Ranjit Kumar, *Navbharat Times* (Delhi), 8/17/94, p. 7; in JPRS-TND-94-107, 9/8/94, p. 19 (4524). K.K. Katyal, *Hindu*, 8/27/94, p. 5 (4324).

PAKISTAN WITH MULTI-COUNTRY GROUP

8/29/94-9/1/94

A four-nation group of representatives from the MTCR visit India and Pakistan to discuss the objectives of the regime in regards to missile developments in the region. The

delegates from Australia, Switzerland, the U.S., and the U.K. begin what they describe as "the first stage in a dialogue." The team's discussions with India on 8/29-8/30 cover the Prithvi and Agni programs. Pakistan's Hatf-1 and Hatf-2 programs, and possibly the Chinese transfer of M-11s to Pakistan, are discussed during the team's meetings with Pakistan on 9/1-9/2. Pakistan informs the delegates that it supports a missile-free South Asia, but that India's development and deployment of missiles could spur a nuclear arms race in the region. According to Indian defense sources, the MTCR team does not bring up the issue of India discontinuing its missile program.

Tahir Ikram, Reuter; in Executive News Service, 9/2/94 (4535). *Flight International*, 9/21/94, p. 18 (4537).

PAKISTAN WITH PRC

8/22/94

According to U.S. officials, Pakistan has agreed to pay China \$15 million as a partial payment on its 1988 contract with the China Precision Machinery Import and Export Corp., which is government owned, for an indeterminate number of M-11 missiles, launchers, and support equipment.

Washington Times, 9/7/94, pp. A1, A18 (4549). R. Jeffrey Smith and Thomas W. Lippman, *Washington Post*, 9/8/94, p. A32 (4622).

9/94

For the first time, Pakistan concedes that it has purchased M-11 missiles from China. Pakistan Embassy political counselor Zamir Akram said in Washington, D.C., that his country has made no secret of the purchases. Pakistan states that sanctions should not be levied due to the purchase because the range of the M-11 missile falls below the required 300 km minimum range set by the MTCR. Other Pakistani officials continue to deny that Pakistan has made the purchase.

R. Jeffrey Smith and Thomas W. Lippman, *Washington Post*, 9/8/94, p. A32 (4622). *Asian Age*, 9/9/94; in *International Security Digest*, 9/94, p. 94 (4539).

9/94

It is reported that a U.S. intelligence report, which was leaked to the media, said that

Chinese technicians will soon travel to Pakistan to assist in activating the M-11 missiles that China had sold to Pakistan.

Wall Street Journal, 9/14/94, p. A18 (4451).

PAKISTAN WITH UNITED STATES

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan. One official adds that, currently, three Pakistani submarines are capable of firing submarine-launched Harpoon missiles.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

PEOPLE'S REPUBLIC OF CHINA

INTERNAL DEVELOPMENTS

Late 5/94

According to U.S. intelligence, China launches a new diesel-electric submarine, which U.S. analysts call the Wuhan-C. The Wuhan-C is a possible prototype for the Type 039, a second-generation Ming class submarine produced in 1990 that will be capable of firing surface-to-surface anti-ship missiles while submerged.

Barbara Starr, *Jane's Defence Weekly*, 8/13/94, p. 3 (4373).

6/94

The Director of U.S. Naval Intelligence (DNI) Rear Admiral Edward D. Shafer, Jr. releases a posture statement, which states that China is "believed to be working on an indigenous design for a second generation nuclear-powered ballistic missile submarine to carry a new SLBM also in development; the new SSBN may be launched by the turn of the century."

Jon B. Wolfsthal and Dunbar Lockwood, *Arms Control Today*, 7/94, p. 23 (4359).

7/94

It is reported that China launches its Apstar-1 telecommunications satellite into orbit in defiance of a U.N. pact requiring consent for close orbits and despite Japan's request to change Apstar's orbit.

Wall Street Journal, 7/22/94, p. A8 (4447).

8/28/94

China launches its Long March-2E rocket from Xichang in its third successful lift-off, carrying an Australian Optus B3 commercial satellite made by Hughes.

Flight International, 9/7/94, p. 40 (4381).

PRC WITH INDIA

9/7/94-9/13/94

Chinese Minister of Defense, General Chi Haotian, leads a delegation to India for discussions on bilateral defense relations. The meetings are unsuccessful and key issues remain unresolved, including China's sale of M-11 missiles to Pakistan, which India is interested in discussing with the Chinese. The negotiations also include discussion on collaborative Chinese-Indian space exploration.

Vivek Raghuvanshi, *Defense News*, 9/19/94, p. 34 (4538).

PRC WITH IRAN

7/94

U.S. Pentagon officials state that China is ready to deliver 10 fast-attack missile boats and an "undisclosed number" of 83 km range anti-ship missiles to Iran.

Elaine Sciolino, *New York Times*, 7/5/94, p. A1 (4571).

PRC WITH PAKISTAN

8/22/94

According to U.S. officials, Pakistan has agreed to pay China \$15 million as a partial payment on its 1988 contract with the China Precision Machinery Import and Export Corp., which is government owned, for an indeterminate number of M-11 missiles, launchers, and support equipment.

Washington Times, 9/7/94, pp. A1, A18 (4549). R. Jeffrey Smith and Thomas W. Lippman, *Washington Post*, 9/8/94, p. A32 (4622).

9/94

For the first time, Pakistan concedes that it has purchased M-11 missiles from China. Pakistan Embassy political counselor Zamir Akram said in Washington, D.C., that his country has made no secret of the purchases. Pakistan states that sanctions should not be levied due to the purchase because the range of the M-11 missile falls below the required 300 km minimum range set by the MTCR. Other Pakistani officials continue to deny that Pakistan has made the purchase.

R. Jeffrey Smith and Thomas W. Lippman, *Washington Post*, 9/8/94, p. A32 (4622). *Asian Age*, 9/9/94; in *International Security Digest*, 9/94, p. 94 (4539).

9/94

It is reported that a U.S. intelligence report, which was leaked to the media, said that Chinese technicians will soon travel to Pakistan to assist in activating the M-11 missiles that China had sold to Pakistan.

Wall Street Journal, 9/14/94, p. A18 (4451).

PRC WITH RUSSIA

6/94

It is reported that in the opinion of U.S. intelligence sources, China is currently employing several thousand former Soviet scientists and technicians in the research, development, and production of advanced weapons. The weapons include a new generation of mobile, solid-fuel intercontinental missiles and a modern version of the Soviet MiG series of tactical aircraft. The scientists, most of whom are Russian, are paid in hard currency and receive a higher salary than they would at home.

U.S. News & World Report, 6/6/94, p. 24 (4445).

9/3/94

Russian President Boris Yeltsin and the Chairman of the PRC Jiang Zemin sign a joint declaration which includes measures to ensure the non-targeting of their strategic nuclear missiles and a statement that neither country will be the first to use nuclear weapons against the other.

Andrey Kirillov, Anna Melnikova, and Vladimir Solntsev, *Itar-Tass World Service* (Moscow), 9/3/94; in FBIS-SOV-94-172, 9/6/94, p. 19 (4483). Andrey Kirillov, Anna Melnikova, and Vladimir Solntsev, *Itar-Tass* (Moscow), 9/3/94; in FBIS-SOV-94-172, 9/6/94, p. 12 (4483). Michael Specter, *New York Times*, 9/4/94, p. 4 (4550). Sergei Shargorodsky, *Washington Times*, 9/4/94, p. A8 (4374). Nadezhda Potapova, *Itar-Tass* (Moscow), 9/6/94; in FBIS-SOV-94-172, 9/6/94, pp. 18-19 (4483).

ROMANIA

INTERNAL DEVELOPMENTS

6/94

RATMIL, which was once the Bucharest-based Romanian state arsenal, is developing modifications for Soviet-designed equipment and is also developing new equipment such as "reactive shells" for 122 mm truck-mounted 40-tube MRLs.

Paul Beaver, *Jane's Defence Weekly*, 6/25/94, p. 30 (4377).

Early 9/94

Romanian deputy national police chief General Costica Voicu announces that police have arrested seven Romanians in Turnu Severin, on Romania's Danube River border with Yugoslavia, for attempting to sell 11 "triggering devices" for surface-to-air missile warheads; the arrest took place in early 9/94. According to the police, the missile devices were manufactured in Romania by a manufacturer that has not yet been identified.

Washington Times, 9/13/94, p. A12 (4311).

RUSSIA

INTERNAL DEVELOPMENTS

4/94

As a result of the START II agreement, a strategic nuclear division at Khabarovsk is to be deactivated and its base occupied by a sub-unit of the main center for space vehicle operation and testing.

Segodnya, 4/8/94, p. 2; in FBIS-SOV-94-068, 4/8/94, p. 32 (4362).

6/94

The Director of U.S. Naval Intelligence (DNI) Rear Admiral Edward D. Shaefer, Jr. releases a posture statement which states that Russia's first Typhoon-class SSBN at Severodvinsk shipyard is "undergoing an overhaul and modernization to accommodate new ballistic missiles," believed to be SS-N-20s. In the 1993 posture statement, the DNI said that the SS-N-20s "should begin flight testing soon."

Jon B. Wolfsthal and Dunbar Lockwood, *Arms Control Today*, 7/94, p. 23 (4359).

6/22/94

Under the direction of the Ministry of Defense, Russian Strategic Nuclear Forces carry out coordinated launches of strategic missiles of all three legs of the nuclear triad, including the launch of an RS-12M "Topol" (SS-25) ICBM from Plesetsk to the Kura testing ground on the Kamchatka Peninsula, the launch of an SLBM from the Barents Sea, and the launch of a long-range ALCM, possibly an AS-15, from a Tu-160 bomber.

Russian Television Network (Moscow), 6/22/94; in FBIS-SOV-94-122, 6/24/94, p. 31 (4609). Anatoliy Yurkin, *Itar-Tass* (Moscow), 6/22/94; in FBIS-SOV-94-120, 6/22/94, p. 28 (4609). Ostankino Television First Channel Network (Moscow), 6/22/94; in FBIS-SOV-94-121, 6/23/94, p. 26 (4609). Viktor Litovkin, *Izvestiya* (Moscow), 6/23/94, p. 1 (4609).

7/94

It is reported that Russia is developing a new, fast, and subsonic unmanned aerial vehicle (UAV), the "Malachite F," with pro-

duction primarily geared for export. According to Deputy Head of Procurement Colonel Valery Barkovski, the UAV being developed is a 950 km/h system with a one hour endurance time, a 300 km radius of action, and an increased payload capacity to handle the radar and other sensors. The UAV is not related to any current drone or target development program, Barkovski said.

Charles Bickers, *Jane's Defence Weekly*, 7/23/94, p. 24 (4599).

8/94

It is reported that the Khrunichev State Space and Scientific-Production Center (KSSSPC) wins a competition to establish the Angara space complex as the site for future heavy-class space launch vehicles. The launch pads from which the Angara will launch will most likely be situated in Plesetsk in Northern Russia and, later, at Svobodny in the Russian Far East. The Russian Space Corporation Energia and the Makeyev State Rocket Center will develop the hydrogen-oxygen fueled second stage of the Angara rocket.

Interfax, 8/18/94; in FBIS-SOV-94-161, 8/19/94, p. 24 (4396).

8/94

It is reported that a new Russian coastal defense missile system, called the Bal (Wave), will be marketed by the Granit Institute in St. Petersburg to clients in the Arabian Gulf, South America, and Asia. The Bal battery system consists of four launch vehicles with eight missiles apiece, a mobile command and control vehicle, and a radar target acquisition vehicle utilizing the 3Ts-24 surveillance radar. The Bal utilizes the Kh-35 missile, which is the equivalent of the U.S. Navy's Harpoon.

Steven Zaloga, *Armed Forces Journal*, 8/94, p. 43 (4463).

8/94

It is reported that there have been a minimum of 10 incidents in which the mobile launch vehicles of the RS-12M Topol (SS-25) have overturned. None of the accidents were severe enough to ignite the solid fuel engines, nor have the nuclear warheads been involved in any dangerous incidents. The mobile truck is a massive, 10-wheeled vehicle similar to an earlier model designed

for use with the RSD-10 (SS-20).

Steven Zaloga, *Armed Forces Journal*, 8/94, p. 43 (4585).

8/18/94

A surface-to-surface missile engine ignites, due to careless handling during planned loading and unloading work at a technical battalion subordinate to the Moscow Air Defense District. The accident causes a fire in the missile engine and warhead storage area and a series of explosions leading to the deaths of a missile transfer crew and the disappearance of a crane operator. The ensuing explosions also destroy a technical installation, however, no local inhabitants are hurt and no damage to the environment results from the accident.

Valeriy Prasolov, *Krasnaya Zvezda* (Moscow), 8/23/94, p. 2; in FBIS-SOV-94-163, 8/23/94, p. 28 (4578).

9/94

It is reported that the A-135 domestic nuclear interceptor, which works by using atmospheric nuclear explosions to kill incoming missiles both at close range and far away, has been complete for more than three years and is awaiting a decision by the defense minister to deploy it in place of existing A-50 and A-30 interceptors in the Moscow ABM belt. The A-135 would destroy the first salvo of nuclear missiles, giving Russian leaders the time needed to launch a counter-strike. There are 100 A-135 missiles lying in depots near Moscow, awaiting deployment.

Pavel Felgengauer, *Segodnya* (Moscow), 9/16/94, p. 1; in FBIS-SOV-94-180, 9/16/94, pp. 27-28 (4590).

9/94

It is reported that Strategic Missile Forces unit X commander Colonel Aleksey Zhvanko has stated that he is in charge of an operation currently scrapping six obsolete strategic missiles from Russia, Ukraine, and Belarus per month. In the near future, the number of missiles dismantled at the operation may increase to 10-12 missiles per month.

Oleg Bedula, *Krasnaya Zvezda*, 9/14/94, p. 1; in FBIS-SOV-94-179, 9/15/94, p. 24 (4592).

9/20/94

The Russian power distribution authority Energonadzor cuts off the power to the Strategic Rocket Forces (SRF) Central Command Post (CCP) for three to four hours because of an unpaid power bill. The SRF CCP has an autonomous power supply, but there is some debate as to whether the cut off threatened national security. An SRF spokesperson said that the autonomous power supply was switched on "in a brief time" but added that such a cutoff could lead to "significant complications in controlling nuclear weapons." SRF commander Igor Sergeev said, "You cannot even imagine how much switching off the electricity threatened the security of this country."

Segodnya (Moscow), 9/23/94, p. 1; in FBIS-SOV-94-185, 9/23/94, p. 30 (4583). Oleg Falichev and Aleksandr Dolinin, *Krasnaya Zvezda* (Moscow), 9/23/94, p. 1; in FBIS-SOV-94-185, 9/23/94, pp. 31-32 (4613). David Hearst, *Guardian*, 9/23/94 (4613). Adi Ignatius, *Wall Street Journal*, 9/23/94 (4613).

9/22/94

Russian Prime Minister Viktor Chernomyrdin says that he would punish officials at the Moscow region electrical authority who cut the power to the Central Command of Russia's strategic nuclear force due to unpaid bills. The power authority reportedly did not know the identity of the military installation prior to the incident.

International Herald Tribune, 9/23/94 (4393).

9/23/94

A regiment of the Omsk division of the Russian Strategic Missile Troops at the Plesetsk test range flight-tests a "dummy" SS-25 Topol strategic nuclear missile. The missile successfully hits its training ground target on the Kamchatka peninsula 25 minutes after launch. Russia has also developed and indigenously built a new missile, the Topol-M.

Anatoliy Yurkin, *Itar-Tass* (Moscow), 9/24/94; in FBIS-SOV-94-186, 9/26/94, p. 27 (4482). NTV (Moscow), 9/25/94; in FBIS-SOV-94-186, 9/26/94, pp. 27-28 (4482).

**RUSSIA WITH AFGHANISTAN AND
TAJIKISTAN**

8/10/94

According to Russian military forces in Dushanbe, the 12th post of the Moscow border troops headquarters in Tajikistan is attacked by missiles fired from Afghan territory. The Russians respond with suppressive fire on the missile launcher emplacement; no casualties are reported.

Itar-Tass (Moscow), 8/11/94; in FBIS-SOV-94-155, 8/11/94, p. 36 (4564).

8/27/94

During the early morning hours, Tajik Mujaheedeen launch several missiles at the Russian Frontier Guard observation position and post on the Turk Heights in Tajikistan. The missiles are launched from the area of the Afghan-Tajik border and from Afghan territory, according to the second commander of Russian border guards in Tajikistan, Major General Aleksandr Savchenko. No Russian soldiers are killed.

Galina Gridneva, Itar-Tass (Moscow), 8/28/94; in FBIS-SOV-94-167, 8/29/94, p. 48 (4392).

RUSSIA WITH AUSTRALIA

7/94

The new launch complex that is being developed by Russia and the Australian company Space Transportation Systems (STS) on Papua New Guinea, which has a completion date of 1998, will allow Russia to double the payload it can launch into geostationary orbits on its Proton rockets from 2.4 metric tons to 4.8 metric tons.

Journal of Commerce, 1/21/94, p. 3A; in *RA Report no. 17*, 7/94, p. 75 (4607).

RUSSIA WITH BELARUS

5/18/94

Russia withdraws the first shipment of SS-25 ICBMs from Belarus. At present, it is believed that 27 SS-25s have been withdrawn from Belarus to Russia.

Neue Zürcher Zeitung, 5/20/94; in *Arms Control Today*, 6/94 (4522). PPNN Newsbrief, Second Quarter, p. 17 (4522).

RUSSIA WITH INDIA

6/94

It is reported that Russia has announced its commitment to provide the spare parts for equipment India had purchased from the Soviet Union and called for greater trade between the two countries. In addition, Russian Deputy Prime Minister Youri [sic] Yarov says that the problems with the cryogenic engine deal between Russia and India will be sorted out because Russia considers it important for the two countries to maintain good relations.

Hindu, 6/18/94, p. 5 (4388).

7/31/94

It is reported that the Indian army may purchase Tunguska air defense systems from Russia. The Indian Defence Research and Development Organisation (DRDO) is against the purchase as it wants to produce its indigenously built Trishul SAM as early as feasible, and "buying the Russian system would pull the plug on funds."

Sudeep Chakravarti and Sunil Dasgupta, *India Today*, 7/31/94, pp. 30-35 (4334).

RUSSIA WITH ISRAEL

9/94

Russian Space Agency Director General Yuri Koptev meets with Israeli Space Agency Chairman Yuval Ne'eman to discuss possible launcher and satellite cooperation between the two countries. Israeli sources report that Koptev broached the possibility of Russia launching Israeli satellites and inspected Israeli space facilities. Ne'eman and Koptev sign an agreement to encourage scientific and commercial space contacts.

Space News, 9/5/94, p. 2 (4476).

RUSSIA WITH KAZAKHSTAN

6/94

It is reported that Kazakh National Space Agency Director Aisultan Kalybayev has said that a draft treaty calling for Russia to pay Kazakhstan \$115 million a year for use of the Baykonur Cosmodrome is in compliance with a 3/28/94 agreement signed by

Russian President Boris Yeltsin and Kazakh President Nursultan Nazarbayev. Russia will rent the launch pads and buildings located in the Kazakh town of Leninsk for a term of 20 years, which can be extended for another 10-year period. The municipal council in Leninsk expressed concern over the future of the Baykonur Cosmodrome. It has supported an appeal made by several of its members to the Kazakh Supreme Soviet about the lack of a mechanism for implementing the agreement signed by Russia and Kazakhstan on the use of Baykonur.

Interfax (Moscow), 6/8/94; in FBIS-SOV-94-111, 6/9/94, p. 64 (4422). Vladimir Akimov, Itar-Tass (Moscow), 6/10/94; in FBIS-SOV-94-113, 6/13/94, p. 70 (4421).

RUSSIA WITH KUWAIT

6/94

Kuwait welcomes a high-level Russian military delegation to conclude a substantial weapon systems sale. Kuwait is intent on buying the S-300/S-300V (SA-10 "Grumble"/SA-12 "Gladiator") and TOR M-1 (SA-15 "Gauntlet") SAMs. Kuwait may also buy BMP-2s and -3s, as well as five S-300 systems which could be integrated into its air defense system beside its U.S.-built Patriot missiles.

James Bruce, *Jane's Defence Weekly*, 7/9/94, p. 1 (4467).

8/8/94

An official of Rosvooruzheniye, a Russian state-owned arms trading company, announces a contract for Kuwait's purchase of 27 300 mm, twelve-round BM 9A52-2 Smerch multiple rocket launch systems.

Stephen Foye, *RFE/RL News Briefs*, 8/8/94, p. 3 (4470). Viktor Litovkin, *Izvestiya* (Moscow), 8/11/94, p. 2; in FBIS-SOV-94-157, 8/15/94, p. 10 (4470). Christopher F. Foss and James Bruce, *Jane's Defence Weekly*, 8/20/94, p. 21 (4582).

8/29/94

It is reported that Russia is close to concluding a deal to sell an SA-12 missile defense system to Kuwait. Once the SA-12 is integrated with the U.S.-built Patriot anti-missile systems, Kuwait will have the only two-tier missile defense system outside of Russia. However, Russia's Rosvooruzheniye

said that Kuwait has not yet ordered the system. Kuwait's Defense Minister, Sheik Ahmed Mahud Sabah Ahmed, has indicated that Kuwait may be interested in buying the SA-10, the SA-12, and the SA-15.

Christopher F. Foss and James Bruce, *Jane's Defence Weekly*, 8/20/94, p. 21 (4582). *Washington Times*, 8/29/94, p. A16 (4455). Christopher F. Foss and James A. Bruce, *Washington Times*, 9/21/94, p. A11 (4582).

RUSSIA WITH NORTH KOREA

7/94

It is reported that three North Koreans are detained while allegedly attempting to gather missile and nuclear technology in Russia.

Washington Times, 7/5/94; in ISD, 7/94 (4494).

RUSSIA WITH PRC

6/94

It is reported that in the opinion of U.S. intelligence sources, China is currently employing several thousand former Soviet scientists and technicians in the research, development, and production of advanced weapons. The weapons include a new generation of mobile, solid-fuel intercontinental missiles and a modern version of the Soviet MiG series of tactical aircraft. The scientists, most of whom are Russian, are paid in hard currency and receive a higher salary than they would at home.

U.S. News & World Report, 6/6/94, p. 24 (4445).

9/3/94

Russian President Boris Yeltsin and the Chairman of the PRC, Jiang Zemin, sign a joint declaration which includes measures to ensure the non-targeting of their strategic nuclear missiles and a statement that neither country will be the first to use nuclear weapons against the other.

Andrey Kirillov, Anna Melnikova, and Vladimir Solntsev, Itar-Tass World Service (Moscow), 9/3/94; in FBIS-SOV-94-172, 9/6/94, p. 19 (4483). Andrey Kirillov, Anna Melnikova, and Vladimir Solntsev, Itar-Tass (Moscow), 9/3/94; in FBIS-SOV-94-172, 9/6/94, p. 12 (4483). Michael Specter, *New York Times*, 9/4/94, p. 4 (4550). Sergei Shargorodsky, *Washington Times*, 9/4/94, p. A8 (4374). Nadezhda Potapova, Itar-Tass (Moscow), 9/6/94; in FBIS-SOV-94-172, 9/6/94, pp. 18-19 (4483).

RUSSIA WITH SOUTH KOREA

8/94

It is reported that Gennadiy Yanpolskiy, vice-chairman of the Russian state committee for defence sectors of industry, has stated, "We could agree to supply S-300 complexes to South Korea given its desire to buy them."

Vladimir Solntsev, Itar-Tass (Moscow), 8/10/94; in FBIS-SOV-94-154, 8/10/94, p. 9 (4454).

8/4/94

South Korean Defense Ministry officials state that South Korea and Russia will complete an agreement in 9/94 for Russia to transfer military weaponry, including S-300 air defense missiles, to South Korea as payment for a portion of the \$650 million Russian debt to South Korea.

Defense News, 8/8/94, p. 2 (4413).

RUSSIA WITH UNITED STATES

5/5/94

U.S. officials propose a range of cooperative ballistic missile defense programs with Russia that are to involve the sharing of basic technology, as well as jointly-conducted experiments and exercises.

BMD Monitor, 7/1/94, p. 228 (4353).

6/94

It is reported that Russia and the U.S. are currently negotiating the inclusion of Russian SS-25 ballistic missiles in the 1993 bilateral launch agreement that allowed Russia access to the lucrative space launch market in exchange for Russian promises to price its services at market value. The problem is that Russia is using SS-25s to boost low-earth orbit (LEO) payloads for between \$3.5 and \$7 million, which is below market value. Under the 1993 agreement, LEO launches were to be handled on a case-by-case basis; the U.S. would like to place a more specific limit on the launches.

Aerospace Daily, 6/2/94, pp. 343-344 (4586).

6/94

The Clinton Administration agrees to Russian demands to freeze the capability of U.S. high-speed anti-missile missiles at current levels under the terms of the 1972 Anti-

Ballistic Missile (ABM) Treaty. As a result, the speed of new interceptors will be limited to 1.24 miles per second, the speed of those used in the U.S. Army's new Theater High Altitude Area Defense (THAAD) system. The administration's decision also effectively stalls the development of several wide-area missile defense systems, including the Navy's Upper Tier system and the Air Force's Boost Phase Intercept Program, which is designed to kill theater missiles shortly after launch. The U.S. also agrees to end the development of new Army, Navy, and Air Force wide-area defense systems.

Washington Times, 7/1/94 (4318). Bill Gertz, *Washington Times*, 7/1/94, p. A3 (4390).

7/94

It is reported that the Russians have proposed a series of tests and experiments utilizing early warning sensors, Patriot missile interceptors, and the SA-12 missile system. According to the U.S. Air Force Senior Executive Officer for Space Maj. Gen. Garry Schnelzer, the cost would presumably be divided between the U.S. and Russia.

BMD Monitor, 7/1/94, p. 228 (4353).

7/94

It is reported that the Douglas Company of the U.S. has contracted with Novator, a Russian firm based in Yekaterinburg, to deliver 2,000 Russian missiles to the U.S. Army for use as test targets for the next generation of U.S. anti-missile missile systems.

Leonid Pozdeyev, *Krasnaya Zvezda*, 6/3/94, p. 1; in FBIS-SOV-94-109, 6/7/94, pp. 14-15 (4391). *Intelligence Newsletter*, 7/26/94, p. 7 (4391).

8/94

It is reported that the U.S. Air Force's Philips Laboratory will begin using a new Russian generator based on a rocket engine to test new advanced weaponry systems. The Russian generator is a magneto-hydrodynamic generator that converts chemical energy into kinetic energy, and then into electrical energy, by burning rocket fuel to create a high speed plasma flow which is directed through a magnetic field to induce voltage.

International Defense Review, 8/94, p. 70 (4492).

RUSSIA WITH UNITED KINGDOM AND UNITED STATES

5/25/94

Russian Defense Minister General Pavel Grachev writes a letter to Russian President Boris Yeltsin announcing the completion of nuclear missile detargeting. Russian ICBMs were detargeted in accordance with an agreement that had been initially concluded between the U.S. and Russia in 1/94, which the U.K. joined in 2/94. The agreement called for the missiles to be retargeted by 5/30/94. The missiles are not currently targeted at any location, so, because they cannot be launched without a flight plan, unauthorized launches cannot occur.

Asian Defense Journal, 8/94, pp. 104-105 (4418).

SAUDI ARABIA

INTERNAL DEVELOPMENTS

8/5/94

Defector Mohammed A. al-Khilewi, the former second-ranking official at the Saudi Mission to the U.N., states that in 1985 "Saudi Arabia started to think seriously about starting its own nuclear weapons program." Saudi Arabia has CSS-2 IRBMs in its arms inventory.

Paul Lewis, *New York Times*, 8/7/94 (4338).

SAUDI ARABIA WITH UNITED STATES

9/94

It is reported that Raytheon has won a \$9.3 million contract from the U.S. Army Missile Command for integration work on eight Patriot tactical fire units bought by Saudi Arabia. According to Raytheon's Vice President of Corporate Communications, Pat Coulter, one of the eight units will be used for Saudi training and another will be kept as a floating spare.

Defense News, 9/19/94, p. 25 (4554).

SOUTH AFRICA

INTERNAL DEVELOPMENTS

5/94

It is reported that a new SAM, which will probably be a navalized version of the SAHV-3 missile, is being developed as part of the South African Navy's (SAN) corvette requirement. Kentron has done preliminary work on a vertical launch version of the Mach 3.5, 123 kg, 12 km range SAHV-3, which is capable of 40 g's, but there are indications that the SAN will opt for a trainable launcher. Future upgrades of the ships may include a new SSM.

Helmoed-Romer Heitman, *Jane's Defence Contracts*, 5/94, pp. 1-2 (4306).

7/94

Johan Alberts, CEO of South Africa's Denel company, announces that Denel's Eloptro optics/optronics and Kentron divisions have been merged, and are now operating under the name of Kentron. Kentron now consists of three sections: Dynamics, Eloptro, and Ireco. Kentron Dynamics produces the Darter infra-red AAM, ZT-35 anti-tank missile, Seeker RPV, and Skua high-speed target. Ireco produces stabilized TV/FLIR turrets for aircraft and helicopters, and Eloptro is to produce items such as IR sensors, thermal imagers, and laser range-finders. Kentron is to increase emphasis on long-range reconnaissance and stand-off weapons.

Helmoed-Romer Heitman, *Jane's Defence Weekly*, 7/2/94, p. 37 (4310).

8/94

The South Africa company Kentron, a division of the Denel company, has reportedly developed a 'stealth' target drone called the Flowchart-2, which is intended to simulate "low-observable" aircraft and cruise missiles. The Flowchart-2 is 5 m long, with a wingspan of 3.5 m, and incorporates a new, low observable airframe with many subsystems from the Skua high-speed tar-

get drone. The Flowchart-2 weighs 600 kg fully loaded and travels at high subsonic speeds.

Helmoed-Romer Heitman, *Jane's Defence Weekly*, 8/20/94, p. 10 (4560).

SOUTH AFRICA WITH UNITED KINGDOM

9/94

It is reported that Kentron may enter the U.K. SR(A)1236 conventionally armed air-launched stand-off missile (CASOM) competition with its modular stand-off weapon (MUPSOW), a classified South African Air Force program that is still in the developmental phase. The MUPSOW has been described by one source as "somewhere between the Apache and the Tomahawk," and is thought to be a follow-on to the H2 extended-range glide bomb, which reportedly began development in the late 1970s and was employed in the Angolan war. The U.K. Treasury is to review the CASOM program before the request for proposals; this delay is likely to be beneficial for the Kentron bid. It is believed that U.K. Ministry of Defence officials have met with South African officials regarding the MUPSOW.

Flight International, 9/14/94, p. 16 (4308).

SOUTH KOREA

SOUTH KOREA WITH RUSSIA

8/94

It is reported that Gennadiy Yanpolskiy, vice-chairman of the Russian state committee for defence sectors of industry, has stated, "We could agree to supply S-300 complexes to South Korea given its desire to buy them."

Vladimir Solntsev, *Itar-Tass* (Moscow), 8/10/94; in FBIS-SOV-94-154, 8/10/94, p. 9 (4454).

8/4/94

South Korean Defense Ministry officials state that South Korea and Russia will complete an agreement in 9/94 for Russia to

transfer military weaponry, including S-300 air defense missiles, to South Korea as payment for a portion of the \$650 million Russian debt to South Korea.

Defense News, 8/8/94, p. 2 (4413).

SYRIA

INTERNAL DEVELOPMENTS

6/26/94

In an interview, an Israeli official states, "Syria already has produced a small quantity of the [Scud-C] missiles and they already have their own launchers. In 12 to 24 months, they will enter into full production capability." According to Israeli military officials, Syrian leaders consider the Scud-C SSM as a counter to the Israeli Air Force's strike capabilities. Despite the fact that Syria's total defense budget has dropped in 1994 to around \$3 billion, or 44 percent of its national budget, Israeli officials have stated that Syria has increased spending on its Scud-C program; production of the Scud-C and other SSMs has become the highest military priority in Syria.

Richard C. Barnard and Barbara Opall, *Defense News*, 7/4/94, p. 15 (4337).

SYRIA WITH ISRAEL

6/22/94

In a speech to the Zionist General Council, Israeli Prime Minister Yitzhak Rabin says that "Syria today has ground-to-ground missiles in quantity and in quality that [make] what we suffered from Iraq in the gulf war [seem like] a children's game." Opposition leaders denounce Rabin for attempting to frighten opponents into advocating an extensive withdrawal from the Golan Heights.

Sharone Parnes, *Defense News*, 6/27/94, p. 16 (4335).

TAIWAN

INTERNAL DEVELOPMENTS

7/94

Taiwan makes public photographs showing the Hsiung Feng-2 medium-range ASM. The Hsiung Feng-2, believed to be derived from a ship-launched missile, utilized turbofan propulsion and active radar and imaging infrared (IIR) dual-seeker guidance. It will probably be carried on Taiwan's AIDC Ching-Kuo indigenous defense fighter, and may also be used on Taiwan's F-16, Mirage 2000, and AT-3 "support variant" aircraft. The Hsiung Feng series and the Sky Sword AAM were developed by the Chung Shan Institute of Science and Technology (CSIST), a division of Aero Industry Development Centre (AIDC).

Charles Bickers, *Jane's Defence Weekly*, 6/18/94, p. 4 (4345). *Flight International*, 8/3/94, p. 18 (4345).

8/94

It is reported that Taiwan has deployed the Sky Bow SAM, Sky Sword AAM, and U.S. Hawk missiles to defend against a possible Chinese invasion. Sky Bow and Sky Sword were developed by the Taiwanese military's Chungshan Institute of Science and Technology.

Asia Pacific Defence Review, 8/94, p. 81 (4330).

TAIWAN WITH UNITED STATES

6/29/94

The U.S.'s Raytheon Co. signs a contract with Taiwan's Defense Ministry to sell Taiwan \$600 million worth of Modified Air Defense Systems (MADS), which are based on the Patriot missile system. Other sources report the deal is worth \$565 million. The MADS system will replace one of Taiwan's older Nike-Hercules SAM battalions, and will be deployed in the northern region of Taiwan. Under the terms of the contract, Raytheon will supply Taiwan with fire units,

missiles, related hardware, logistics and spare parts support, installation assistance, and training. The MADS are to be delivered beginning in 9/96.

Aerospace Daily, 7/1/94, p. 5A (4415). Jason Glashow, *Defense News*, 7/4/94, p. 16 (4415). *BMD Monitor*, 7/15/94, p. 237, (4415). *Washington Times*, 7/17/94, p. A7 (4415). *International Defense Review*, 9/94, pp. 13-14 (4415).

TAJIKISTAN

TAJIKISTAN WITH AFGHANISTAN AND RUSSIA

8/10/94

According to Russian military forces in Dushanbe, the 12th post of the Moscow border troops headquarters in Tajikistan is attacked by missiles fired from Afghan territory. The Russians respond with suppressive fire on the missile launcher emplacement; no casualties are reported.

Itar-Tass (Moscow), 8/11/94; in FBIS-SOV-94-155, 8/11/94, p. 36 (4564).

8/27/94

During the early morning hours, Tajik Mujaheedeen launch several missiles at the Russian Frontier Guard observation position and post on the Turk Heights in Tajikistan. The missiles are launched from the area of the Afghan-Tajik border and from Afghan territory, according to the second commander of Russian border guards in Tajikistan, Major General Aleksandr Savchenko. No Russian soldiers are killed.

Galina Gridneva, Itar-Tass (Moscow), 8/28/94; in FBIS-SOV-94-167, 8/29/94, p. 48 (4392).

TURKEY

TURKEY WITH MULTI-COUNTRY GROUP

6/9/94

Turkey hosts a NATO meeting in Istanbul at which the foreign ministers of NATO settle on a counterproliferation policy of strengthening existing international agreements while preparing defenses against potential nuclear or chemical weapon-armed ballistic missile threats from rogue states in the Middle East or North Africa. A policy statement released after the meeting said, "Weapons of mass destruction and their delivery means can pose a direct military risk to the member states of the alliance and to their forces." The ministers provide no information on how NATO, which is already evaluating the establishment of ballistic missile defenses, could adapt to meet this threat.

Aliza Marcus, *Reuter*, 6/9/94; in *Executive News Service*, 6/10/94 (4307).

TURKEY WITH UNITED STATES

8/1/94

The U.S. Defense Department announces that it has proposed to sell Turkey 596 more air-to-air and air-to-surface missiles for approximately \$137 million. The missile deal would include 80 AIM-120 Advanced Medium Range Air-to-Air Missiles (AMRAAM) worth roughly \$52 million, 500 AIM-9 Sidewinder air-to-air missiles for \$55 million, and 16 Harpoon anti-ship missiles for \$30 million.

Umit Enginsoy, *Defense News*, 8/8/94, p. 18 (4431).
Jane's Defence Weekly, 8/13/94, p. 12 (4595).

9/94

McDonnell Douglas is awarded a contract for 75 SLAMs and 44 Harpoon missiles. The contract is worth \$125 million, but its value may increase by \$12 million if Turkey opts to procure 12 Harpoon missiles. Of the 44 Harpoon missiles currently covered by the deal, Egypt will receive 16, Ja-

pan 3, and Malaysia 25. Work on the contract is expected to be completed by 12/96.

Reuter, 8/22/94; in *Executive News Service*, 8/24/94 (4347). *Flight International*, 9/14/94, p. 40 (4347).

9/94

The Pentagon informs Congress of the proposed \$32 million sale of 270 Multiple Launch Rocket System pods to Turkey.

International Defense Review, 9/94, p. 9 (4349).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

UKRAINE

INTERNAL DEVELOPMENTS

8/94

A number of surface-to-air missiles are stolen from a military unit in the Cherkassk region of Ukraine by both servicemen and civilians, according to the Ukrainian Ministry of Defense. Some of the missiles have been located.

Interfax (Moscow), 8/11/94; in *FBIS-SOV-94-156*, 8/12/94, p. 26 (4462).

UKRAINE WITH CROATIA

7/22/94

The Ukrainian Defense Ministry press service denies a report by the Serbian publication *Novny* that stated that Croatia has procured 20 S-300 anti-missile systems from Ukraine. The Ukrainian Defense Ministry press service states that Ukraine operates in accordance with the moratorium on the sale of arms to combative nations.

Radio Ukraine World Service (Kiev), 7/22/94; in *FBIS-SOV-94-142*, 7/25/94, p. 35 (4312).

Krasnaya Zvezda, 7/26/94, p. 1; in *FBIS-SOV-94-147*, 8/1/94, pp. 32-33 (4605).

UKRAINE WITH FRANCE

5/94

It is reported that Aerospatiale of France and Yuzhnoe of Ukraine have signed four contracts which provide for the conversion of SS-24 oxygen tanks to containers for liquid oxygen and kerosene; the use of SS-24 missiles and components to manufacture small rockets that will launch satellites into a low-earth orbit from France's space center in Guiana; the use of a 30 ton thrust engine as the second stage booster for small rockets; and the conversion of SS-24 ICBM missile components to boosters for the Ariane-5 SLV.

Ukrinform (Kiev), 5/30/94; in *FBIS-SOV-94-105*, 6/1/94, pp. 46-47 (4487).

7/94

It is reported that Ukraine is initiating joint technology transfers with France's CNES and the U.S. NASA, as well as booster development with U.S. Boeing and France's Aerospatiale for the 461-ton "piggyback" air-launched Zenit booster.

Intelligence Newsletter, 7/26/94, p. 7 (4488).

UKRAINE WITH INDIA

9/16/94

According to Andrey Zhalko-Titarenko, acting Director General of the Ukraine Space Agency, Ukraine and India sign an agreement to cooperate in the areas of space technology and the remote probing of the Earth. Zhalko-Titarenko states that there is a provision in the agreement for the use of Indian boosters to launch Ukrainian satellites and the reciprocal use of space facilities. The U.S. is concerned that rocket technologies that fall under the MTCR may be transferred to India. Ukraine, according to Zhalko-Titarenko, has assured the U.S. that the agreement does not have any "military applications."

Pavlo Balkovsky, *Reuter*, 9/18/94 (4548). *Interfax (Moscow)*, 9/20/94; in *FBIS-SOV-94-183*, 9/21/94, p. 60 (4534). *Hindu*, 9/24/94, p. 16 (4542). *Space News*, 9/26/94, p. 2 (4542).

UKRAINE WITH UNITED STATES

7/94

It is reported that Ukraine is initiating joint technology transfers with France's CNES and the U.S. NASA, and booster development with U.S. Boeing and France's Aerospatiale for the 461-ton "piggyback" air-launched Zenit booster.

Intelligence Newsletter, 7/26/94, p. 7 (4488).

8/31/94

During a meeting between the Ukrainian American Community and a U.S. delegation which includes the Ambassador-at-Large to the newly-independent states of the former Soviet Union, James Collins, details of the \$350 million Nunn-Lugar aid package to Ukraine are revealed. An SS-24 dismantlement project will receive \$50 million, and the U.S. will participate in the building of storage facilities for SS-19 fuel.

UNIS; in *Ukrainian Weekly*, 9/11/94, pp. 2, 16 (4490).

UNITED KINGDOM

INTERNAL DEVELOPMENTS

8/94

It is reported that the HMS Vanguard Trident submarine has successfully completed its first test-firing of an unarmed Trident II D-5 ballistic missile while submerged off the Florida coast.

Asia-Pacific Defence Reporter, 8/94, p. 23 (4509).

UNITED KINGDOM WITH FRANCE

9/94

It is reported that Matra and Aerospatiale of France are interested in entering the U.K. conventionally armed air-launched stand-off missile (CASOM) competition with the Apache and ASMP-C missiles.

Flight International, 9/14/94, p. 16 (4308).

UNITED KINGDOM WITH RUSSIA AND UNITED STATES

5/25/94

Russian Defense Minister General Pavel Grachev writes a letter to Russian President Boris Yeltsin announcing the completion of nuclear missile detargeting. Russian ICBMs were detargeted in accordance with an agreement that had been initially concluded between the U.S. and Russia in 1/94, which the U.K. joined in 2/94. The agreement called for the missiles to be retargeted by 5/30/94. The missiles are not currently targeted at any location, so, because they cannot be launched without a flight plan, unauthorized launches cannot occur.

Asian Defense Journal, 8/94, pp. 104-105 (4418).

UNITED KINGDOM WITH SOUTH AFRICA

9/94

It is reported that Kentron may enter the U.K. SR(A)1236 conventionally armed air-launched stand-off missile (CASOM) competition with its modular stand-off weapon (MUPSOW), a classified South African Air Force program that is still in the developmental phase. The MUPSOW has been described by one source as "somewhere between the Apache and the Tomahawk," and is thought to be a follow-on to the H2 extended-range glide bomb, which reportedly began development in the late 1970s and was employed in the Angolan war. The U.K. Treasury is to review the CASOM program before the request for proposals, a delay that will likely be beneficial for the Kentron bid. It is believed that U.K. Ministry of Defence (MoD) officials have met with South African officials regarding the MUPSOW.

Flight International, 9/14/94, p. 16 (4308).

UNITED KINGDOM WITH UNITED STATES

9/94

It is reported that several U.S. companies are interested in entering the U.K. conventionally armed air-launched stand-off weapon (CASOM) competition. McDonnell Douglas and Hunting may enter the Grand

SLAM, Hughes may enter the Air Hawk, and Texas Instruments may enter the extended-range JSOW variant. Rockwell may enter the AGM-130 stand-off weapon, although the missile's 200 km (110 nm) range falls short of the 400 km range requirement expected to be given in the British Ministry of Defence request.

Flight International, 9/14/94, p. 16 (4308).

9/94

It is reported that McDonnell Douglas (MDC) of the U.S. is negotiating with GEC-Marconi Avionics (GMAV) of the U.K. over the possibility of including the British company's advanced infra-red imaging (IIR) seeker as part of the Grand SLAM missile produced by MDC and Hunting. The Grand SLAM missile is competing for the Royal Air Force's (RAF) stand-off missile requirement. It is estimated that 500-1,000 missiles will be purchased to meet the RAF's conventional stand-off needs.

Flight International, 9/21/94, p. 18 (4439).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

UNITED STATES

INTERNAL DEVELOPMENTS

6/2/94

The Extended Range Interceptor (ERINT), produced by Loral Vought, intercepts and destroys an MQM-107D target drone at the White Sands Missile Range, completing its third successful test in a row. The drone simulates a typical diving ground attack maneuver that an aircraft might use to attack a ground target. The ERINT, recently approved as the missile for the PAC-3 mis-

sile defense system, has in the last six months intercepted Storm targets which were carrying simulated bulk chemical warheads and submunitions.

Aerospace Daily, 6/3/94, p. 354 (4419).

6/16/94

Raytheon Missile Corporation announces that it has received a \$43.3 million contract to provide the U.S. Navy with 145 Standard missiles, one-half of the FY 1994 allotment for Standard missiles. The Standard missile is a supersonic, all-weather SAM able to engage hostile aircraft and missiles up to 80 miles distant. It provides fleet air defense and is the Navy's primary air defense missile.

Arms Trade News, 7/94, p. 2 (4355).

7/94

The U.S. State Department concludes that the high endurance unmanned aerial vehicle (UAV) to be designed for use in the ARPA Tier II Plus project falls under the MTCR as a "Category I system." The State Department will decide on a case-by-case basis whether foreign companies can compete to participate in the UAV project. The UAV can carry 500 kg (1,100 lbs) over 300 km (186 mi). ARPA would like the Tier II Plus system to be able to carry 1,500 lbs over a distance of 900-1,900 mi.

Defense Daily, 7/5/94, (4479). *Aerospace Daily*, 7/7/94, p. 24 (4479). *Jane's Defence Contracts*, 8/94, p. 6 (4479).

7/94

It is reported that kinetic energy missile technology, developed by the U.S. Army, may be provided to the U.S. Air Force for use in the AF Boost Phase Interceptor (BPI) program, designed to kill theater ballistic missiles shortly after launch. The Army program, the Atmospheric Interceptor Technology (AIT) program, is a part of the weapons directorate at the Army Space and Strategic Defense Command, and is one of several Army theater ballistic missile defense programs that are to be follow-ons to the Patriot interceptor and the THAAD systems.

Jason Glashow and Theresa Hitchens, *Defense News*, 7/11/94, p. 8 (4501).

7/25/94

It is reported that THAAD program man-

ager Col. Fred Kilgore will propose delays in the first test firing of the THAAD hit-to-kill interceptor at a 7/25/94 meeting with the director of the BMDO, Army Lt. Gen. Malcolm O'Neill.

Jason Glashow and Barbara Opall, *Defense News*, 7/25/94, pp. 1, 28 (4493).

7/30/94

The U.S. Air Force announces that an MX Peacekeeper missile was struck by two high-power rifle bullets which caused \$11 million worth of damage. The missile was struck during a journey from an Air Force base near Cheyenne, Wyoming to Vandenburg Air Force Base for a test launch scheduled for 9/94. The missile had been disassembled and packed in unmarked box-cars for the journey, and was hit in the first and second stages by the unknown sniper. The damage was discovered during a routine inspection after delivery. The missile was rendered useless by the bullets, and was sent to Ogden, Utah where inspectors will determine how much of it can be salvaged. The Air Force maintains that there was never any danger of the nuclear-tipped missile exploding.

Sunday Times, 7/31/94 (4346).

8/10/94

U.S. Senate and House conferees finalize the defense authorization bill allocating a \$263.8 billion budget for Fiscal Year 1995. The bill includes \$696 million for 18 Trident II SLBMs to be used on the Navy's 10 Trident ballistic missile submarines in the Atlantic Fleet. The bill also eliminates \$375 million previously allocated for 48 Tri-Service Standoff Attack Missiles (TSSAMs) to be built by Northrup-Grumman. Under the bill, both the Navy's Tier II theater missile defense and the Air Force's Brilliant Eyes, space-based missile-attack warning satellite programs' funding will be restricted until it has been determined that the programs are allowed under the ABM Treaty.

Arthur G. Atkins and Dunbar Lockwood, *Arms Control Today*, 9/94, p. 26 (4465). Bloomberg, 9/14/94 (4465).

9/94

It is reported that a new U.S. Navy targeting system, called the Cooperative Engagement Capability (CEC), performed well. In

a series of tests on the aircraft carrier USS Dwight D. Eisenhower and other ships, the CEC was used against seven simulated ballistic missile launches and one live launch. The system shows great potential for increasing the abilities of land-based air defense weapons, including the Army's Patriot missile.

Robert Holzer, *Defense News*, 9/26/94, p. 12 (4519).

9/94

It is reported that the U.S. Navy awards Hughes Aircraft Co. a "sole-source" contract worth over \$2 billion to build Tomahawk cruise missiles. The contract provides \$130 million for 216 Block III Tomahawk missiles, with future options for 1995-1998 purchases and \$226.5 million for development of the Block IV Tomahawk upgrade under the Tomahawk Baseline Improvement Program (TBIP). Under TBIP, two versions of the Block IV Tomahawk will be designed for greater effectiveness against hardened and relocatable targets. The Tomahawk Multi-Mission Missile (TMMM), for use against land-based targets and ships, will carry the smaller and lighter WDU-36B high-explosive warhead, allowing for additional fuel and a greater range. The warhead design for the second version, the Tomahawk Hard Target Penetrator (THTP), will be determined by Hughes.

International Defense Review, 7/94, pp. 16-17 (4486). Steven Pearlstein, *Washington Post*, 9/17/94; in Executive News Service, 9/19/94 (4486). Jeff Cole, *Wall Street Journal*, 9/19/94, p. 3 (4486). *Jane's Defence Weekly*, 9/24/94, p. 3 (4486). Bruce A. Smith, *Aviation Week & Space Technology*, 9/26/94, pp. 86-87 (4486).

9/94

It is reported that Honeywell Military Avionics has been awarded a contract by the U.S. Navy for guidance units to be used in the improved versions of the Navy's Standoff Land Attack Missile (SLAM), produced by the McDonnell Douglas Co. The initial order is for 28 guidance and navigation units for use during the initial upgrade development phase of the improved SLAM, but that number could increase by another 750 units, depending on final procurement levels.

Defense News, 9/29/94, p. 19 (4593).

9/94

The U.S. Navy approves the acquisition of the AGM/RGM/UGM-84G Harpoon Block 1G upgrade, which will be installed in over 2,000 existing Block 1C Harpoon missiles. The Block 1G Upgrade consists of software modifications that will allow the missile to re-attack missed targets until it runs out of fuel, and an enhanced electronics counter-countermeasures package.

Jane's Defence Weekly, 9/17/94, p. 12 (4596).

9/3/94

The U.S. Air Force (USAF) unveils its new radar-evading cruise missile, the Tri-Service Standoff Attack Missile (TSSAM), in an effort to preserve the program. The military would like to procure 4,100 TSSAMs at a cost of over \$2 million each, and the USAF and Navy plan to go forward with the \$13.3 billion program if funding is secured from Congress. A number of companies are preparing to offer less expensive systems to replace the TSSAM if the Pentagon decides to terminate the program because of technical problems and cost overruns.

Charles Aldinger, *Reuter*, 9/6/94; in *Executive News Service*, 9/7/94 (4601). *Jane's Defence Weekly*, 9/24/94, p. 10 (4602).

9/20/94

The Defense Resources Board meets to consider three possible design concepts for the Alert, Locate, and Report Missiles (ALARM) system, a program the U.S. Air Force plans to spend about \$1 billion on between 1995 and 1999.

Andrew Lawler, *Space News*, 8/15/94, pp. 4, 21 (4567). Steve Weber, *Space News*, 9/26/94, pp. 3, 21 (4567). Steve Weber, *Defense News*, 9/26/94, pp. 4, 36 (4567).

9/23/94

U.S. Congressman Robert Livingston from Louisiana announces the formation of the Coalition to Defend America, a group dedicated to ensuring that no further reductions in missile defenses are negotiated during the U.S.-Russian summit scheduled for late 9/94. Livingston releases letters signed by 32 House members and 39 Senators urging President Clinton not to negotiate limits on theater missile defense.

Washington Times, 9/24/94, p. A5 (4354).

UNITED STATES WITH EGYPT

9/94

McDonnell Douglas is awarded an \$125 million contract by the U.S. Navy for 75 SLAMs and 44 Harpoon missiles. Of the 44 Harpoon missiles currently covered by the deal, Egypt will receive 16, Japan 3, and Malaysia 25. Work on the contract is expected to be completed by 12/96.

Reuter, 8/22/94; in *Executive News Service*, 8/24/94 (4347). *Flight International*, 9/14/94, p. 40 (4347).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

UNITED STATES WITH GREECE

5/94

Israel, Greece, and Japan finalize a \$43.4 million Foreign Military Sales contract with the U.S. Loral Vought Systems for the purchase of Multiple Launch Rocket Systems (MLRS) and rockets. By 9/95, Japan will receive 72 practice rockets, by 12/96 Israel will receive 6 MLRS launchers, 726 tactical rockets, and 720 practice rockets, and by 2/97 Greece will take delivery of 9 MLRS launchers and 132 reduced-range practice rockets.

International Defense Review, 8/94, p. 17 (4466).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

UNITED STATES WITH IRAQ

9/15/94

A Jordanian-born, naturalized U.S. citizen, Al M. Harb, is convicted of circumventing

the U.S. trade embargo on Iraq. Harb illegally procured and exported technology, machinery, spare parts, and other goods which experts say were probably intended for military use in the Iraqi government's effort to rebuild advanced weapons systems. Harb was convicted of 23 counts relating to the illegal shipping operation.

Daniel Southerland, *Washington Post*, 9/17/94, p. C5 (4598).

UNITED STATES WITH ISRAEL

5/94

Israel, Greece, and Japan finalize a \$43.4 million Foreign Military Sales contract with the U.S. Loral Vought Systems for the purchase of Multiple Launch Rocket Systems (MLRS) and rockets. By 9/95, Japan will receive 72 practice rockets, by 12/96 Israel will receive 6 MLRS launchers, 726 tactical rockets, and 720 practice rockets, and by 2/97 Greece will take delivery of 9 MLRS launchers and 132 reduced-range practice rockets.

International Defense Review, 8/94, p. 17 (4466).

5/26/94

The Israeli Home Front Command, with U.S. cooperation, detonates a Scud-like missile in a southern Israeli open training range scattered with reinforced structures. The missile, which is similar to Scuds owned by Syria and other Arab countries, contains hundreds of kilograms of explosives; the experiment is designed to study the impact a Scud would create falling into a densely populated area.

Arye Kiesel, *Yedi'ot Aharonot*, 5/27/94, p. 17; in FBIS-NES-94-124, 5/28/94, p. 54 (4478).

6/94

It is reported that Lt. Gen. Malcolm O'Neill, Director of the U.S. Ballistic Missile Defense Organization (BMDO), said that there must be a successful intercept test by the Israeli Arrow missile before the U.S. will provide \$25 million in funding that has already been earmarked for deployment technology R&D or participate in any program to deploy the Arrow. To date, the U.S. and Israel have been jointly developing the Arrow missile under the \$330 million Ar-

row Continuation Experiments (ACES) program, of which the U.S. funds 75 percent.

Barbara Starr, *Jane's Defence Weekly*, 6/4/94, p. 4 (4496).

7/94

It is reported that the Senate Armed Services Committee recommends that the U.S. continue cooperating with Israel on Theater Missile Defense (TMD), the Arrow ATBM, and the boost phase intercept technology program.

BMD Monitor, 7/1/94, p. 227 (4499).

7/94

Feasibility studies of Israel's boost-phase intercept (BPI) technologies are scheduled to be completed. The BPI system, known as the Israel Boost-Intercept System (IBIS), will be composed of long-range high endurance unmanned aerial vehicles (UAV). The UAVs will be equipped with sensors to detect a ballistic missile launch by an enemy. Once a launch is detected, the UAV will fire high-speed air-to-air missiles carrying infrared seekers to destroy the missile over enemy territory.

International Defense Review, 8/94, p. 15 (4568).

9/94

The U.S. Navy begins evaluating the Israeli Barak ship point-defense missile as a possible alternative to the Evolved Sea Sparrow Missile (ESSM), which is being developed by Hughes Missile Systems Co. and Raytheon Co. for an estimated cost of \$250 million. The Barak, which is being developed by Israel Aircraft Industries (IAI) and Rafael Armament Development Authority, is a vertically launched missile weighing 98 kg and has a range of 10 km (5.5 nm). The Barak is being designed to defend ships against high-speed, stealthy, sea-skimming targets.

Barbara Opall, *Defense News*, 9/26/94, p. 14 (4566).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

UNITED STATES WITH ITALY

9/94

The U.S. Pentagon informs Congress of the proposed \$48 million sale of 42 Maverick missiles and 33 AIM-120 AMRAAMs to Italy.

International Defense Review, 9/94, p. 9 (4349).

UNITED STATES WITH JAPAN

5/94

Israel, Greece, and Japan finalize a \$43.4 million Foreign Military Sales contract with the U.S. Loral Vought Systems for the purchase of Multiple Launch Rocket Systems (MLRS) and rockets. By 9/95, Japan will receive 72 practice rockets; by 12/96, Israel will receive 6 MLRS launchers, 726 tactical rockets, and 720 practice rockets; and by 2/97, Greece will take delivery of 9 MLRS launchers and 132 reduced-range practice rockets.

International Defense Review, 8/94, p. 17 (4466).

5/94

Japan signs a \$50 million contract with U.S. Loral Vought Systems for an additional 9 MRLS launchers (5 assembled and 4 partially assembled) to be delivered to Japan's Nissan Aerospace division of the Nissan Motor Company by 8/96.

Jane's Defence Weekly, 6/25/94, p. 13 (4466).

6/94

U.S. Ballistic Missile Defense Organization (BMDO) Director Lt. Gen. Malcolm O'Neill gives his Japanese counterparts a briefing entitled "Ballistic Missile Defense: Options for Japanese TMD" in which four options for Japanese ballistic missile defense are outlined. Japan's present plan includes the deployment of 24 Patriot PAC-2 units that are to be operational by 1999 and up to four Aegis destroyers and four AWACS aircraft that are to be operational by 1998. Missile defense option A would cost \$4.5 billion and would use Aegis destroyers in concert with Patriot PAC-3 land-based units to engage targets in the upper and lower tiers respectively. Option B would cost \$16.3 billion and would include Patriot PAC-3 units, eight new Aegis destroyers, and a new

radar system situated west of Tokyo. Option C would cost \$4.55 billion and would employ six land-based THAAD firing units and the Patriot PAC-3, for a combined total of 560 missiles. Option D would cost \$8.9 billion and would include five THAAD firing units, upgraded Patriot missiles, and four Aegis destroyers. Each of the Aegis destroyers would carry 36 ATBMs; one would be stationed in the Sea of Japan, one off Kyushi, and the remaining two held in reserve.

Paul Beaver, *Jane's Defence Weekly*, 8/13/94, p. 21 (4350).

6/94

Japan considers a U.S. proposal for cooperation on Theater Missile Defense (TMD). Via the program, the U.S. hopes to gain access to Japanese radar circuit production technology, "advanced materials" to produce lightweight rockets, and cooperation in the production of an optoelectronic guidance system for ATBMs.

Daily Japan Digest, 6/20/94 (4339).

6/8/94

Meetings commence in Tokyo between Japan and a team from the U.S. Pentagon's Ballistic Missile Defense Organization (BMDO), headed by David Martin. The U.S. is seeking to jointly develop a two-phase sea-based tactical missile defense system with Japan, at an estimated cost of \$85 million, using Aegis ships and upgrades of the U.S. Standard SAM. The first "Navy Lower-Tier" phase includes Aegis upgrades and slight changes in the Standard missile. The second "Navy Upper-Tier" phase would augment the Standard missile with a kinetic kill vehicle to intercept missiles at higher altitudes.

Barbara Opall and Naoaki Usui, *Defense News*, 6/6/94, pp. 1, 42 (4400).

9/94

McDonnell Douglas is awarded an \$125 million contract by the U.S. Navy for 75 SLAMs and 44 Harpoon missiles. Of the 44 Harpoon missiles currently covered by the deal, Egypt will receive 16, Japan 3, and Malaysia 25. Work on the contract is expected to be completed by 12/96.

Reuter, 8/22/94; in Executive News Service, 8/24/94 (4347). *Flight International*, 9/14/94, p. 40 (4347). *Defense News*, 9/19/94, p. 24 (4508).

9/10/94

It is reported that the Japan Defence Equipment Association will establish a "joint research committee" by the end of 1994 to examine the Theater Missile Defense (TMD) system, in order to "coordinate activities already underway." The cost of the proposed TMD system could exceed \$20 billion.

Jane's Defence Weekly, 9/10/94, p. 16 (4341).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

UNITED STATES WITH MALAYSIA

9/94

McDonnell Douglas is awarded an \$125 million contract by the U.S. Navy for 75 SLAMs and 44 Harpoon missiles. Of the 44 Harpoon missiles currently covered by the deal, Egypt will receive 16, Japan 3, and Malaysia 25. Work on the contract is expected to be completed by 12/96.

Reuter, 8/22/94; in Executive News Service, 8/24/94 (4347). *Flight International*, 9/14/94, p. 40 (4347). *Defense News*, 9/19/94, p. 24 (4508).

UNITED STATES WITH MULTI-COUNTRY GROUP

8/94

It is reported that three European partners of the Polyphem fibre-optic-guided, short-range missile program, Aerospatiale, Deutsche Aerospace (DASA), and Italmissile, want to work with the U.S. company that is awarded a contract for the Enhanced Fibre-Optic Guided Missile (EFOGM) program. According to DASA head Ernst Seiffarth, "close contact" has been made with Boeing, Hughes, Raytheon, and Westinghouse, the U.S. companies competing for EFOGM. The Polyphem missile's middle-range variant has a turbojet engine providing a range of 60 km. The long-range version has stealth features and a possible

range of 150 km. U.S. Teledyne appears to be favored to supply the turbojet engine for the mid- and long-range missiles, but as yet no decision has been made.

Flight International, 8/17/94, p. 15 (4443).

UNITED STATES WITH NORTH KOREA

6/29/94

Assistant Secretary of State Robert Gallucci, commenting on the upcoming 7/8/94 talks with North Korea in Geneva, states, "We would like to see the North Koreans adjust their missile technology export policy and also their development policy." Gallucci adds, "If the dialogue fails and if the DPRK does not prove willing to take the necessary steps to resolve issues, we will return again to the Security Council."

Sid Balman Jr., UPI, 6/29/94 (4366).

UNITED STATES WITH PAKISTAN

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan. One official adds that, currently, three Pakistani submarines are capable of firing submarine-launched Harpoon missiles.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

UNITED STATES WITH RUSSIA

5/5/94

U.S. officials propose a range of cooperative ballistic missile defense programs with Russia that are to involve the sharing of basic technology, as well as jointly-conducted experiments, and exercises.

BMD Monitor, 7/1/94, p. 228 (4353).

6/94

It is reported that Russia and the U.S. are currently negotiating the inclusion of Russian SS-25 ballistic missiles in the 1993 bilateral launch agreement that allowed Russia access to the lucrative space launch mar-

ket in exchange for Russian promises to price its services at market value. The problem is that Russia is using SS-25s to boost low-earth orbit (LEO) payloads for between \$3.5 and \$7 million, which is below market value. Under the 1993 agreement, LEO launches will be handled on a case-by-case basis; the U.S. would like to place a more specific limit on the launches.

Aerospace Daily, 6/2/94, pp. 343-344 (4586).

6/94

The Clinton Administration agrees to Russian demands to freeze the capability of U.S. high-speed anti-missile missiles at current levels under the terms of the 1972 Anti-Ballistic Missile (ABM) Treaty. As a result, the speed of new interceptors will be limited to 1.24 miles per second, the speed of those used in the U.S. Army's new Theater High Altitude Area Defense (THAAD) system. The administration's decision also effectively stalls the development of several wide-area missile defense systems, including the Navy's Upper Tier system and the Air Force's Boost Phase Intercept Program, which is designed to kill theater missiles shortly after launch. The U.S. also agrees to end the development of new Army, Navy, and Air Force wide-area defense systems.

Washington Times, 7/1/94 (4318). Bill Gertz, *Washington Times*, 7/1/94, p. A3 (4390).

7/94

It is reported that the Russians have proposed a series of tests and experiments utilizing early warning sensors, Patriot missile interceptors, and the SA-12 missile system. According to the U.S. Air Force Senior Executive Officer for Space Maj. Gen. Garry Schnelzer, the cost would presumably be divided between the U.S. and Russia.

BMD Monitor, 7/1/94, p. 228 (4353).

7/94

It is reported that the Douglas Company of the U.S. has contracted with Novator, a Russian firm based in Yekaterinburg, to deliver 2,000 Russian missiles to the U.S. Army for use as test targets for the next generation of U.S. anti-missile missile systems.

Leonid Pozdeyev, *Krasnaya Zvezda*, 6/3/94, p. 1; in FBIS-SOV-94-109, 6/7/94, pp. 14-15 (4391). *Intelligence Newsletter*, 7/26/94, p. 7 (4391).

8/94

It is reported that the U.S. Air Force's Philips Laboratory will begin using a new Russian generator based on a rocket engine to test new advanced weaponry systems. The Russian generator is a magneto-hydrodynamic generator that converts chemical energy into kinetic energy, and then into electrical energy, by burning rocket fuel to create a high speed plasma flow which is directed through a magnetic field to induce voltage.

International Defense Review, 8/94, p. 70 (4492).

UNITED STATES WITH RUSSIA AND UNITED KINGDOM

5/25/94

Russian Defense Minister General Pavel Grachev writes a letter to Russian President Boris Yeltsin announcing the completion of nuclear missile detargeting. Russian ICBMs were detargeted in accordance with an agreement that had been initially concluded between the U.S. and Russia in 1/94, which the U.K. joined in 2/94. The agreement called for the missiles to be retargeted by 5/30/94. The missiles are not currently targeted at any location, so, because they cannot be launched without a flight plan, unauthorized launches cannot occur.

Asian Defense Journal, 8/94, pp. 104-105 (4418).

UNITED STATES WITH SAUDI ARABIA

9/94

It is reported that Raytheon has won a \$9.3 million contract from the U.S. Army Missile Command for integration work on eight Patriot tactical fire units bought by Saudi Arabia. According to Raytheon's Vice President of Corporate Communications, Pat Coulter, one of the eight units will be used for Saudi training and another will be kept as a floating spare.

Defense News, 9/19/94, p. 25 (4554).

UNITED STATES WITH TAIWAN

6/29/94

The U.S.'s Raytheon Co. signs a contract with Taiwan's Defense Ministry to sell Tai-

wan \$600 million worth of Modified Air Defense Systems (MADS), which are based on the Patriot missile system. Other sources report the deal is worth \$565 million. The MADS system will replace one of Taiwan's older Nike-Hercules SAM battalions, and will be deployed in the northern region of Taiwan. Under the terms of the contract, Raytheon will supply Taiwan with fire units, missiles, related hardware, logistics and spare parts support, installation assistance, and training. The MADS are to be delivered beginning in 9/96.

Aerospace Daily, 7/1/94, p. 5A (4415). Jason Glashow, *Defense News*, 7/4/94, p. 16 (4415). *BMD Monitor*, 7/15/94, p. 237, (4415). *Washington Times*, 7/17/94, p. A7 (4415). *International Defense Review*, 9/94, pp. 13-14 (4415).

UNITED STATES WITH TURKEY

8/1/94

The U.S. Defense Department announces that it has proposed to sell Turkey 596 more air-to-air and air-to-surface missiles, for approximately \$137 million. The missile deal would include 80 AIM-120 Advanced Medium Range Air-to-Air Missiles (AMRAAM) worth roughly \$52 million, 500 AIM-9 Sidewinder air-to-air missiles for \$55 million, and 16 Harpoon anti-ship missiles for \$30 million.

Umit Enginsoy, *Defense News*, 8/8/94, p. 18 (4431). *Jane's Defence Weekly*, 8/13/94, p. 12 (4595).

9/94

McDonnell Douglas is awarded a contract for 75 SLAMs and 44 Harpoon missiles. The contract is worth \$125 million, but its value may increase by \$12 million if Turkey opts to procure 12 Harpoon missiles. Of the 44 Harpoon missiles currently covered by the deal, Egypt will receive 16, Japan 3, and Malaysia 25. Work on the contract is expected to be completed by 12/96.

Reuter, 8/22/94; in Executive News Service, 8/24/94 (4347). *Flight International*, 9/14/94, p. 40 (4347).

9/94

The U.S. Pentagon informs Congress of the proposed \$32 million sale of 270 Multiple Launch Rocket System pods to Turkey.

International Defense Review, 9/94, p. 9 (4349).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

UNITED STATES WITH UKRAINE

7/94

It is reported that Ukraine is initiating joint technology transfers with France's CNES and the U.S.'s NASA, and booster development with U.S. Boeing and France's Aerospatiale for the 461-ton "piggyback" air-launched Zenit booster.

Intelligence Newsletter, 7/26/94, p. 7 (4488).

8/31/94

During a meeting between the Ukrainian American Community and a U.S. delegation which includes the Ambassador-at-Large to the newly-independent states of the former Soviet Union, James Collins, details of the \$350 million Nunn-Lugar aid package to Ukraine are revealed. An SS-24 dismantlement project will receive \$50 million, and the U.S. will participate in the building of storage facilities for SS-19 fuel.

UNIS; in *Ukrainian Weekly*, 9/11/94, pp. 2, 16 (4490).

UNITED STATES WITH UNITED KINGDOM

9/94

It is reported that several U.S. companies are interested in entering the U.K. conventionally armed air-launched stand-off weapon (CASOM) competition. McDonnell Douglas and Hunting may enter the Grand SLAM, Hughes may enter the Air Hawk, and Texas Instruments may enter the extended-range JSOW variant. Rockwell may enter the AGM-130 stand-off weapon, although the missile's 200 km (110 nm) range falls short of the 400 km range requirement expected to be given in the British Ministry of Defence request.

Flight International, 9/14/94, p. 16 (4308).

9/94

It is reported that McDonnell Douglas (MDC) of the U.S. is negotiating with GEC-Marconi Avionics (GMAv) of the U.K. over the possibility of including the British company's advanced infra-red imaging (IIR) seeker as part of the Grand SLAM missile produced by MDC and Hunting. The Grand SLAM missile is competing for the Royal Air Force's (RAF) stand-off missile requirement. It is estimated that 500-1,000 missiles will be purchased to meet the RAF's conventional stand-off needs.

Flight International, 9/21/94, p. 18 (4439).

9/23/94

U.S. Navy intelligence officers state that the submarine-launched Harpoon missile has been transferred to seven countries: Egypt, Greece, Japan, Israel, Turkey, the U.K., and Pakistan.

Giovanni de Briganti and Vivek Raghuvanshi, *Defense News*, 9/26/94, pp. 1, 34 (4332).

YEMEN

YEMEN WITH MOLDOVA AND RUSSIA

6/20/94

According to Moldovan news sources, the Moldovan Ministry of Defense sells four MiG-24s and seven missile launchers, worth a total of \$40 million, to Yemen via Rosvooruzheniye, a Russian state arms company.

Itar, 8/23/94 (4376).

YEMEN WITH NORTH KOREA

6/8/94

Yemeni President Ali Abdullah Saleh states that North Korea has agreed to sell missiles to the southern side in Yemen's civil war. Saleh, who leads the northern forces, said, "Now we have received confirmation about a new contract of MiG-29 (jets) and a num-

ber of T-82 (tanks) and tactical missiles contracted with North Korea."

Reuter, 6/13/94; in *Executive News Service*, 6/13/94 (4429).

6/13/94

In response to Yemeni President Ali Abdullah Saleh's statement concerning a contract with North Korea for weapons, including tactical missiles, an unidentified North Korean Foreign Ministry spokesman tells the [North] Korean Central News Agency (KCNA) that the accusation was "...an utterly groundless fabrication."

Reuter, 6/13/94; in *Executive News Service*, 6/13/94 (4429).

YUGOSLAVIA

INTERNAL DEVELOPMENTS

8/94

The local media in Yugoslavia has reported on an indigenously-built SS-1 Scud missile. Western officials have said that these reports are probably propaganda.

Paul Beaver, *Washington Times*, 8/2/94, p. A14 (4471).