BALLISTIC, CRUISE MISSILE, AND MISSILE DEFENSE SYSTEMS: TRADE AND SIGNIFICANT DEVELOPMENTS, JULY-OCTOBER 1995

CONTENTS

OVERVIEW

International endeavors to limit the spread of missile technology appeared to move from strength to strength in October when **Russia** and **South Africa** attended the 10th Plenary Meeting of the Missile Technology Control Regime (**MTCR**) for the first time as full members . **Brazil's** membership was also approved at the meeting. These new memberships are supported by each state's adoption of regulations designed to control the trade in technology that could contribute to the spread of missiles capable of delivering weapons of mass destruction. Beyond the regime's expansion to 28 states, the **MTCR's** technical annex has also been updated to take into account new technical developments. Dialogue with states outside the **MTCR** has also been accorded priority, with an eye to promoting voluntary adherence to the regime's guidelines. **Ukraine** and **South Korea** have already signaled their intention to join the regime and are engaged in formulating the appropriate legislation.

Paradoxically, such developments may not be entirely desirable. For example, **South Korea** has indicated that it may use **MTCR** membership as a basis to withdraw from an agreement with the **United States** that prevents Seoul from developing missile systems with ranges in excess of 180 kilometers. Seoul believes this is a necessary hedge against the **North Korean** missile threat. Elsewhere, events have highlighted the challenge posed to arms control by determined proliferators and commercial interests.

UNSCOM (the United Nations Special Commission in **Iraq**) uncovered startling new evidence regarding Baghdad's pre- and post-Gulf War initiatives to acquire a long-range missile capability. Indeed, in an attempt to preempt the revelations of two senior-level Iraqi defectors, Baghdad informed **UNSCOM** that it had manufactured Scud missile rocket motors, through reverse engineering and had flight-tested chemical warheads. More ominously, **U.N.** and **U.S.** officials have accused **Iraq** of attempting to sustain its long-range missile program by covertly acquiring the necessary technology via a network of European and **Russian** arms dealers and front companies. The **Iraqi** shopping list is said to have included accelerometers, gyroscopes, specialized metals, machine tools, and a **French**-made furnace capable of manufacturing engine parts for missiles. The **U.N.** has accused **French**, **German**, and **Ukrainian** commercial

interests of encouraging **Iraq** in its efforts to bypass **U.N.** Security Council Resolution 687.

Developments in several regions indicate that some states lack confidence in arms control and are now exploring technical responses to missile proliferation. For example, fear over **India's** potential deployment of Privthi missiles along its western border has prompted **Pakistan** to commence development of an ATBM system capable of intercepting these short-range missiles. **China's** conduct of two missile exercises off the **Taiwan** coast (and doubts about the ability of modified Patriot systems to fend off a real missile attack,) have led **Taiwan** to explore the possibility of participation in the **U.S.** (Theater High Altitude Area Defense) program. While Washington hesitates over working with **Taiwan** on advanced theater missile defense (TMD), it has enhanced cooperation with **Japan** and **South Korea**, each having expressed concern over **North Korea's** No-dong missile program. **China** has responded by making it clear that any deployment of advanced ballistic missile defense systems in the region, particularly those with a space-based dimension, will have negative repercussions on the arms control front.

Israel, already well-versed in technical remedies to address its security dilemma in the Middle East, has tested the partly **U.S.**-sponsored Arrow-2 ATBM for the first time. In Europe, **North Atlantic Treaty Organization** has continued to adapt to the post-Cold War security environment by increasing TMD collaboration between member states.

Advanced ballistic missile defense systems will be expensive and technically difficult to develop. Success is by no means assured. The **United States** continues to discuss the reinterpretation of the **Anti-Ballistic Missile Treaty** with **Russia**, seeking a means to make the difficult distinction between systems capable of bringing down strategic-range missiles versus those that can only offer protection against shorter-range and tactical missiles. As these discussions may lead to exports of advanced theater missile defense technology, their outcome is bound to be far-reaching for arms control.

Wyn Bowen and Holly Porteous

NOTE:

A date marked with an "" indicates that an event was reported on that date; a date without an "*" is the date when an event actually occurred.*

The numbers listed in parentheses following the bibliographic references refer to the identification number of the document in the CNS Missile 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.*

AFGHANISTAN

INTERNAL DEVELOPMENTS

10/95

Responding to the Taleban militia's threat to attack Kabul, Afghan President Borhanoddin Rabbani's government deploys Luna missiles in the Safi mountains. The "130 km-range" missiles could be launched against targets in Maydan Shahr, in the Vardak Province, and Mohammad Agha, in the Lugar Province.

IRNA (Tehran), 10/11/95; in FBIS-NES-95-197, 10/11/95 **(5444).**

AFGHANISTAN WITH PAKISTAN

10/27/95*

The Rabbani government's threat to fire Scuds against Islamabad and Peshawar is a bluff because Kabul neither has such missiles nor the personnel to operate them. The Rabbani government's threat is reportedly in response to Pakistan's alleged interference in Afghanistan's affairs. According to former Afghan military officers, in the past Kabul asked the Soviet Union for Scuds approximately two or three days prior to using them. The missiles were subsequently delivered five to 10 hours before they were needed, passing through seven stages prior to launch; each stage involved different groups of Russian engineers. The Afghan Mojahedin reportedly acquired Scud missile launchers following the collapse of the Najibollah government.

Jang (Rawalpindi), 10/27/95, pp. 1, 7; in FBIS-NES-95-209, 10/27/95 **(5437).**

ARGENTINA

ARGENTINA WITH BRAZIL

10/15/95

Brazilian President Fernando Henrique Cardoso announces that he will "thank Argentina for sponsoring Brazil's joining the MTCR" when he meets Argentine President Carlos Menem on 10/17/95.

Telam (Buenos Aires), 10/15/95; in FBIS-LAT-95-199, 10/15/95 **(5583).**

Late 10/95

Brazil and Argentina agree to set up a cooperative arrangement to allow for their pursuit of "common projects involving the MTCR."

Ovidio Bellando, *La Nacion* (Buenos Aires), 10/30/95, p. 6; in FBIS-LAT-95-211, 10/30/95 **(5584).**

AUSTRALIA

INTERNAL DEVELOPMENTS

10/95

Senator Chris Schacht, Australian minister for Small Businesses, Customs, and Construction, says Australia is ideal for launching SLVs because of its excellent record within the MTCR and its proximity to the equator.

Radio Australia (Melbourne), 10/17/95; in FBIS-EAS-95-200, 10/17/95 **(5391).**

10/23/95*

The Australian Royal Navy orders AWA Defence Industries' (AWADI) PRISM missile defense system for its 16 Fremantle-class patrol boats, and for six Huon-class coastal minehunters under construction. The Australian Navy is also considering the PRISM system for its future "offshore patrol combatants program." The PRISM system is designed to provide early warning of missile attacks and to deploy chaff and decoy countermeasures in response.

Gregor Ferguson, *Defense News*, 10/23/95, p. 10 **(5559).**

10/23/95*

Australia's AWADI and M.L. Aviation plan to sell a joint PRISM-Superbarricade missile defense system to countries with small naval vessels. According to industry and diplomatic sources, Asia-Pacific nations have purchased (but have not yet received) 28 patrol, attack, and minehunter ships and intend to purchase 179 more of these vessels; all of these ships weigh less than 1,500 tons. Market researchers attribute the demand for such countermeasure systems to the worldwide proliferation of ASM such as the U.S.'s Harpoon, France's Exocet, Israel's Gabriel, the U.K.'s Sea Eagle, and China's Silkworm.

Gregor Ferguson, *Defense News*, 10/23/95, p. 10 **(5559).**

AUSTRALIA WITH GERMANY AND UNITED STATES

10/23/95*

Australia is seeking to acquire the U.S.-German developed Rolling Airframe Missile defense system as part of its "frigate upgrade program."

Robert Holzer, *Defense News*, 10/23/95-10/29/95, p. 10 **(5565).**

AUSTRALIA WITH RUSSIA

10/18/95*

Russian Space Agency (RSA) and Khrunichev representatives will travel to Australia, in 11/95, to discuss use of Russian Cosmos SLVs to launch small satellites into low-earth orbit from the Woomera rocket range. Woomera is located in northern Australia. The visit will include discussions regarding the Lockheed-Khrunichev-Energia International Launch Services (ILS) proposal to construct "a commercial spaceport in northern Australia."

Flight International, 10/18/95-10/24/95, p. 32 **(5391).**

10/23/95*

Russia's Cosmos Group and the Australian Space Office are negotiating a joint venture to involve the assembly and launch in Australia of a small, Russian-designed, liquid-fueled SLV. Under the proposal, the Russian State Research Center will develop the unofficially named 'Seagull' launcher over the next three to five years. Seagull will be equipped with an engine built by NPO Energomash. Australia will start using Russian Start boosters in 1997, before production of the Seagull rocket begins.

Warren Ferster, *Space News*, 10/23/95-10/29/95, p. 16 **(5635).**

AUSTRALIA WITH RUSSIA AND SWEDEN

Early 1995

Representatives from Russia's rocket production consortium Cosmos, Sweden's Technology Trade International, and several Australian companies discuss forming a joint Russian-Australian venture to "develop and market" a new SLV.

Radio Australia (Melbourne), 10/17/95; in FBIS-EAS-95-200, 10/17/95 **(5391).**

AZORES

AZORES (PORTUGAL) WITH ECUADOR AND SLOVAKIA

3/95

A shipment of "surplus Slovak ground-to-ground missiles," reportedly destined for Ecuador, is intercepted on a plane in the Azores (an autonomous region of Portugal). The aircraft's manifest lists the missiles as medical supplies.

Brendan McNally and Jan Stojaspal, *Prague Post* (Prague), 6/13/95, p. 4; in FBIS-EEU-95-126, 6/13/95 **(5263).** Brendan McNally, *Defense News*, 8/7/95-8/13/95, p. 25 **(5508).**

BAHRAIN

INTERNAL DEVELOPMENTS

9/30/95*

Bahrain is looking to obtain new ordnance to enhance the lethality of its nine U.S.-manufactured Loral Vought Multiple Launch Rocket Systems (MLRS).

Jacques de Lestapis, *Jane's Defence Weekly*, 9/30/95, pp. 32-33 **(5624).**

BELARUS

BELARUS WITH CZECH REPUBLIC, NATO, RUSSIA, AND UKRAINE

7/17/95-7/19/95

Scientific and defense experts meet in Kiev to discuss the dismantling of Ukraine's excess military capabilities, including the issues of how to decommission rocket motors and to dispose of their fuels. The seminar is organized by NATO's Scientific Committee, Ukraine's National Academy of Sciences, and the Ukrainian branch of the World Laboratory. Representatives from Belarus, the Czech Republic, Russia, and four NATO members attend the three day seminar.

Defense News, 9/18/95-9/24/95, p. 2 **(5454).** Intelnews (Kiev), 9/18/95; in FBIS-SOV-95-181, 9/18/95 **(5262).**

BELARUS WITH IRAN

7/95

An Iranian delegation visiting Belarus—which includes Vice President Hasan Habibi—displays a "special interest" in acquiring a "wheeled prime movers plant." Experts predict that Tehran wants the vehicles to transport missile equipment.

Anna Baneva, *Kommersant-Daily* (Moscow) 7/18/95, pp. 1, 4; in FBIS-SOV-95-137, 7/18/95 **(5622).**

BELARUS WITH RUSSIA

7/95

Belarusian President Aleksandr Lukashenka says the agreement reached by his predecessor on the withdrawal of Russian ICBMs from Belarus has been a "big political mistake," and that the missiles should remain in their current positions. Lukashenka's remarks follow decisions by the Belarusian Defense Ministry to stop issuing passes necessary for the removal of missiles to Russia, and to refuse entry into Belarus of Russian trains scheduled to remove the remaining 18 SS-25s.

Viktor Litovkin, *Izvestiya* (Moscow), 7/6/95, pp. 1-2; in FBIS-SOV-95-129, 7/6/95 **(5599).**

8/95

The Chief of Russia's Strategic Rocket Forces (SRF) Colonel General Igor Sergeyev confirms that passes have not been issued for the removal of missiles from Belarus since 7/95, because Minsk has complained that the Russian military is leaving its former facilities in an "inappropriate condition." Thus far, seven of the nine original SS-25 regiments have returned to Russia. Belarusian Deputy Foreign Minister Andrey Sannikov says Belarus has until 2001 to remove all its ICBMs to Russia under the Lisbon Protocol. However, a bilateral agreement between the two states reportedly envisages an end-of-1996 deadline. Sannikov adds that a joint Belarus-Russian commission has been formed to address technical issues related to the withdrawal. According to an anonymous Russian diplomat in Minsk, the suspension of missile withdrawals was a joint decision made by Russian President Yeltsin and President Lukashenka, and was based on lack of funds and accommodation for redeployed missile troops.

Yuriy Drakakhrust, *Belarusskaya Delovaya Gazeta* (Minsk), 8/3/95, p. 3; in FBIS-SOV-95-152, 8/3/95 **(5599).** Viktor Litovkin, *Izvestiya* (Moscow), 7/6/95, pp. 1-2; in FBIS-SOV-95-129, 7/6/95 **(5599).**

8/5/95*

A senior official from the Belarusian Foreign Ministry denies that Belarusian President Aleksandr Lukashenka has halted the transfer of missiles to Russia. According to the official, Lukashenka supports a "slower transfer of the Russian strategic forces" because Moscow has failed to meet its withdrawal obligations regarding the "elimination of environmental hazards" at former missiles sites.

Interfax (Moscow), 8/5/95; in FBIS-SOV-95-11, 8/5/95 **(5599).**

9/28/95

Major General Vladimir Verkhovtsev, of the Main Operational Department of the General Staff of the Russian Armed Forces, says the withdrawal of SS-25s from Belarus has been suspended, pending a "political decision." Experts believe Ukrainian President Aleksandr Lukashenka initiated the suspension and predict that a complete missile

withdrawal will not begin until 1997.

Anatoliy Yurkin, Itar-Tass (Moscow), 9/28/95; in FBIS-SOV-95-189, 9/28/95 **(5599).**

BELARUS WITH UNITED STATES

8/95

The U.S. and Belarus discuss problems regarding the latter's dismantlement of SS-25 missiles following a 6/95 agreement between the two countries on the "liquidation of strategic offensive arms." Under the agreement, the U.S. is required to provide Belarus with equipment for dismantling the missiles. The U.S. will teach Belarusian experts how to utilize the equipment, which will remain in the former Soviet republic after the program ends. The U.S. plans to begin implementing the program in mid-1996.

Belapan (Minsk), 8/17/95; in FBIS-SOV-95-159, 8/17/95 **(5619).**

BOSNIA

BOSNIA WITH RUSSIA AND SERBIA

7/31/95*

Senior Bosnian Serb military officials claim to have acquired Russian-made SA-10B air-defense systems. According to the Bosnian Serbs, their 32 SA-10B launchers and 128 missiles will be used against attacking NATO aircraft. The SA-10B missiles are reportedly armed with fragmented, 220-lb, high-explosive warheads and are capable of intercepting targets at altitudes of between 75 and 90,000 feet. One SA-10B battery can engage six targets simultaneously. U.S. intelligence disputes the Serb claim to possess SA-10B systems because of the lack of physical and electronic evidence of their presence in Bosnia. The SA-10B systems may have been smuggled to Bosnia through Serbia from Eastern Europe.

David A. Fulghum, *Aviation Week & Space Technology*, 7/31/95, pp. 20-21 **(5609).**

BOSNIA WITH IRAN AND RUSSIA

10/9/95

Russian Ministry of Defense (MOD) officials evade questions regarding the possible transfer to Iran of an unexploded U.S. Tomahawk cruise missile which failed to detonate on Bosnian Serb positions. According to media reports, military hardware is being transhipped from Bosnia to Iran via Russia. The MOD also fails to confirm or deny reports that U.S.-manufactured Stinger SAMs and Tow-2 Hellfire ATMs are being transferred from Bosnia to Iran.

Anatoliy Yurkin, Itar-Tass World Service (Moscow), 10/9/95; in FBIS-SOV-95-195, 10/9/95 **(5432).**

BRAZIL

INTERNAL DEVELOPMENTS

3/12/95*

Brazil is scheduled to establish guidelines, in mid-3/95, regarding the future availability of its Alcantara Launch Center (CLA) for other countries involved in the aerospace field.

Joaquim Monteiro, *Correio Braziliense* (Brasilia), 3/12/95, p. 20; in FBIS-TAC-95-003, 3/12/95 **(5317).**

4/26/95

Colonel Tiago da Silva Ribeiro, director of Brazil's SLV program, oversees a successful "engine separation test" at the Aeronautics and Space Institute in Sao Jose dos Campos. Ribeiro says that Brazil's first indigenous SLV will launch a meteorological satellite, made at the Space Research Institute (INPE), from the Alcantara launch site by 6/96. The Brazilian Air Force program involves development of a 20 m long, four-stage, solid-fuel rocket designed to place a 200 kg satellite into low orbit. According to retired Colonel Gerald Cavagnari, director of the Campinas University Strategic Studies Group, the Brazilian Air Force could convert the SLV into an IRBM.

Jose Casado, *O Estado De Sao Paulo* (Sao Paulo), 4/30/95, p. A4; in FBIS-TAC-95-003, 4/30/95 **(5591).**

7/95*

Brazilian defense manufacturer Avibras releases information regarding its new 80 km-range SS-80 rocket, which forms part of a coastal defense system based on the Astros-2 rocket system. The SS-80 is nearly identical to the 60 km-range SS-60 rocket but has a longer range because it incorporates an improved motor. A battery in Avibras's coastal defense system comprises eight individually-sited operational vehicles. Six of these vehicles are AV-LMU launchers which can fire four different caliber rocket types fitted with submunitions. The number of rockets that can be fired from each launcher depends on the caliber type in use.

IDR Despatches, 7/95, p. 3 **(5318).**

7/3/95

Brazilian President Cardoso's government submits a bill to Congress designed to regulate the export of sensitive items, including goods and services applicable to missile development. According to Strategic Affairs Secretary Ronaldo Sardenberg, the bill's enactment will be the culmination of a series of Brazilian commitments to nonproliferation. Other commitments include the creation of the Brazilian Space Agency (AEB) under civilian jurisdiction; the AEB is responsible directly to the President.

Ronaldo Mota Sardenberg, *O Globo* (Rio de Janeiro), 7/12/95, p. 6; in FBIS-TAC-95-004, 7/12/95 **(5315).** Agencia Estado (Sao Paulo), 7/4/95; in FBIS-TAC-95-014-L, 7/4/95 **(5315).**

7/23/95

Brazilian Foreign Minister Luiz Felipe Lampreia reaffirms Brazil's commitment to the nonproliferation of missiles and weapons of mass destruction (WMD). Lampreia describes his government's export control bill as "an essential step forward."

Luiz Felipe Lampreia, *Folha De Sao Paulo* (Sao Paulo), 7/23/95, p. 3; in FBIS-LAT-95-145, 7/23/95 **(5313).**

7/24/95*

Brazilian President Cardoso seeks support among party leaders for his government's draft export control bill. The proposed law will regulate exports of sensitive military and dual-use items, including materials that can be used in the development of missiles and WMD. The law will also enable the government to punish persons that violate Brazilian export regulations. The bill's pas-

sage is necessary for Brazil to become a member of the MTCR, which it expects to join in 10/95. According to Rodrigo de Azeredo, head of the Research Technology Department of the Brazilian embassy in Russia, Brazil began adhering to MTCR guidelines in principle in 2/94, and "unilaterally adopted" missile technology controls in 12/94.

Gazeta Mercantil (Sao Paulo), 7/24/95, p. A5; in FBIS-LAT-95-149, 7/24/95 **(5506).** Aleksandr Korzun, Igor Porshnev, Yevgeniy Terekhov, Interfax (Moscow), 6/19/95; in FBIS-TAC-95-014-L, 6/19/95 **(5506).**

7/25/95

General Sergio Xavier Ferolla, director of the Research and Development Department of Brazil's Ministry of Air, says that the Aerospace Technical Center (CTA) is responsible for developing special steels for Brazil's Sonda series of rockets. The Brazilian firm Eletrometal, in conjunction with the National Bank for Economic and Social Development (BNDES), produces the steels. Ferolla adds that CTA has also developed titanium technology, which it has given to the Rio Doce Valley Company, and ammonium perchlorate, which is produced by the Andrade Gutierrez Chemical company. According to Ferolla, CTA is experiencing difficulties in attracting skilled manpower.

Cosme Degenar, *Technologia & Defesa* (Sao Paulo), pp. 8-12; in FBIS-LAT-95-213, 11/3/95 **(5585).**

7/25/95

General Ferolla, director of the Research and Development Department of Brazil's Ministry of Air, says that AEB is responsible for setting Brazil's space policy while the Ministry of Air is in charge of launch operations. The AEB's 1995 budget allocation is 50 million reals. According to Ferolla, European and U.S. firms have made numerous requests to utilize the Alcantara space launch facility. Ferolla says Brazil is investing heavily to improve Alcantara and plans exist to create a firm to manage the center; the Ministry of Air, however, will remain responsible for security. Brazil's Natal facility, situated in "the middle of the Atlantic Ocean," is already used by European firms to monitor the flights of their space launchers. Brazil hopes the removal of international embargoes will enable it to obtain space launch components and systems through cooperative agreements with overseas firms.

Cosme Degenar, *Technologia & Defesa* (Sao Paulo), pp. 8-12; in FBIS-LAT-95-213, 11/3/95 **(5585).**

8/18/95

Brazilian President Cardoso says that "Brazil does not possess, nor does it produce or intend to produce, to import or to export long-range military missiles capable of carrying weapons of mass destruction."

Fernando Henrique Cardoso, *Defense News*, 9/18/95-9/24/95, p. 32 **(5605).** Luciana Marinho, Voz Do Brasil Network (Brasilia), 8/18/95; in FBIS-LAT-95-161, 8/18/95 **(5506).**

8/29/95

Presidential spokesman Sergio Amaral says the Brazilian government will solve funding problems threatening to delay the SLV's 7/20/96 scheduled launch. According to project engineers, CTA has not received its 1995 budget allocation of $19 million to finance the program's final phase; Colonel Ribeiro, director of the Aeronautics and Space Institute, says the money will pay for manufacture of the Electrical Network Integration Mock-Up (MIR), which will be used to integrate and test key rocket systems. Reportedly, development of control system software is the SLV program's major difficulty. The SLV's propulsion system—capable of propelling the rocket to 7,477 meters per second—incorporates a "special type of steel," allowing temperature resistance of up to 3,000 degrees celsius. The steel, jointly developed by CTA and Acesita (Itabira Special Steel Company), is exported by Brazil. Stage separation is accomplished by a "pyrotechnical" system consisting of explosive charges in lead alloy connection hoops. Brazil has already completed 80 percent of the four-stage, 19 m-long SLV, spending $257 million in the process. After the prototype has been tested, it is estimated that each rocket will cost $10 million. One hundred national companies and 600 CTA associated researchers are involved in building Brazil's SLV.

Daniel Hessel Teich, *O Globo* (Rio de Janeiro), 8/30/95, p. 20; in FBIS-LAT-95-174, 8/30/95 **(5314).**

9/10/95

Strategic Affairs Secretary Sardenberg says Brazil's Strategic Affairs Secretariat (SAE) is responsible for the coordination of export controls on dual-use items, including goods and services related to missiles. The SAE also deals with export controls for biological, chemical, and nuclear-related products. The Secretariat's principal function is to assist the President on issues of national strategy.

Ronaldo Sardenberg, *O Globo* (Rio de Janeiro), 9/10/95, p. 6; in FBIS-LAT-95-178, 9/10/95 **(5316).**

10/5/95

The Brazilian Senate enacts the government's bill which gives SAE the responsibility for controlling exports of missile technology and other sensitive materials. According to Brazilian Senator Hugo Napoleao, the new legislation will facilitate Brazil's acquisition of sensitive technology.

Jornal Do Brasil (Rio de Janeiro), 10/6/95, p. 4; in FBIS-LAT-95-196, 10/6/95 **(5582).**

BRAZIL WITH:

Argentina, 160

BRAZIL WITH FRANCE, GERMANY, ITALY, RUSSIA, AND UNITED STATES

Late 4/95-Early 5/95

Brazil has reportedly smuggled microelectronics items and components from Russia for its SLV program. According to Brazilian technicians, Russia has offered microelectronic components at half the international market rate. A favored location for Brazil and Russia to conduct their negotiations was reportedly the Brazilian Aeronautics Commission's London office. Colonel Ribeiro, director of Brazil's SLV program, claims Brazil has also obtained rocket guidance components from France, Germany, Italy, and the U.S. via the black market. Brazil has failed to purchase a complete inertial guidance system from abroad because of MTCR restrictions, but has resolved this deficiency by acquiring the associated software and individual components instead. The Aeronautics Ministry claims on 5/4/95, however, that the Brazilian government has acquired microelectronic components for the SLV "through legal purchasing mechanisms."

Jose Casado, *O Estado De Sao Paulo* (Sao Paulo),

4/30/95, p. A4; in FBIS-TAC-95-003, 4/30/95 **(5591).** EFE (Madrid), 5/5/95; in FBIS-TAC-95-003, 5/5/95 **(5591).**

BRAZIL WITH GERMANY

9/18/95-9/21/95

During a state visit to Germany, Brazilian President Cardoso will meet with German President Roman Herzog and Prime Minister Helmut Kohl in an effort to forge greater cooperation between the two countries in the areas of space and nuclear technology. According to Brazilian Strategic Affairs Secretary Sardenberg, German cooperation in Brazil's SLV program will be "facilitated" after Brazil becomes a member of the MTCR.

Odail Figueiredo, *O Estado De Sao Paulo* (Sao Paulo), 9/19/95, p. A4; in FBIS-TAC-95-005, 9/19/95 **(5590).**

BRAZIL WITH INDIA, ISRAEL AND PRC

3/95

Israel, China, Brazil, and India are reportedly cooperating on the development of the Arrow anti-missile system.

Viktor Mizin, *Yadernyy Kontrol* (Moscow), 3/95, pp. 12-17; in FBIS-UST-044, 11/1/95 **(5641)**.

BRAZIL WITH:

MTCR, 181

BRAZIL WITH RUSSIA

9/4/95*

General Roberto Jugurta de Camara Senna, third deputy chief of the Brazilian Army Staff, says Brazil has acquired Russian Igla missiles for its anti-aircraft batteries. Senna cites the purchase of these accurate missiles as an example of how Brazil intends to modernize its forces as part of the "Ground Force 2000 (FT 2000)" program.

Cesar Felicio, *Gazeta Mercantil* (Sao Paulo), 9/4/95, p. A6; in FBIS-LAT-95-179, 9/4/95 **(5588).**

BRAZIL WITH UKRAINE

10/95

The head of the Ukrainian Space Agency Alexander Negoda expresses an interest in using Brazil's Alcantara Launch Center (CLA) and in launching a Brazilian satellite in 1996. Ukraine has reportedly offered to assist Brazil's SLV program.

Space News, 10/30/95-11/5/95, pp. 1, 20 **(5580).**

10/25/95

Ukrainian President Leonid Kuchma declares that his country and Brazil are discussing potential cooperative efforts involving space technology. Kuchma says that Brazil offers an inexpensive space launch site, while Ukraine could supply Brazil with "advanced missile technology." Ukraine is interested in using Brazil's CLA in order to conduct test launches.

Reuter, 10/25/95; in Executive News Service, 10/26/95 **(5587).**

BRAZIL WITH UNITED STATES

3/12/95*

According to General Jose Elisande Bayo Barros, director of the Department of Research and Development in Brazil's Ministry of Aeronautics, NASA launched 30 rockets from the Alcantara Launch Center CLA in 1994 as part of an agreement with AEB. Seventy-five NASA technicians and scientists, along with 280 technicians and researchers from CLA and INPE, participated in Operation Guara, the name given to the launches collectively. General Elisande views the operation as an important indicator of CLA's technical expertise in launching small and medium-sized rockets.

Joaquim Monteiro, *Correio Braziliense* (Brasilia), 3/12/95, p. 20; in FBIS-TAC-95-003, 3/12/95 **(5317).**

7/24/95*

AEB is preparing to conclude an agreement with NASA to increase cooperation between the two organizations. The planned agreement will include space research projects and work involving the space shuttle.

O Estado De Sao Paulo (Sao Paulo), 7/24/95, p. A3; in FBIS-LAT-95-150, 7/24/95 **(5506).**

10/30/95*

Manuel Montenegro, the head of the science and technology section at Brazil's embassy in Washington, says that U.S. companies such as Lockheed Martin and Rockwell International have shown an interest in using the Alcantara launch site.

Space News, 10/30/95-11/5/95, pp. 1, 20 **(5580).**

BRUNEI

INTERNAL DEVELOPMENTS

9/23/95*

Brunei is interested in acquiring an offshore patrol vessel fitted with a "vertical launch missile system." Brunei's requirement for three 1,000 ton patrol vessels originated in 1989. Brunei is now reportedly considering ships with a larger displacement than 1,000 tons, in order to fit extra equipment, including the vertical launch missile system. Bruneian officials are scheduled to visit several shipyards in 10/95.

Jane's Defence Weekly, 9/23/95, p. 15 **(5386).**

CANADA

CANADA WITH GERMANY, NETHERLANDS, SPAIN, AND UNITED STATES

10/23/95*

Canada, Germany, the Netherlands, and the U.S. are working together to develop the Local Area Missile System to defend against ASCMs. The system will be based on NATO's Sea Sparrow missile and fitted onboard a new class of anti-air frigate which will be developed with Spain. The new missile will employ an infrared search and scan system and a "new ship's combat system."

Robert Holzer, *Defense News*, 10/23/95-10/29/95, p. 10 **(5565).**

CHILE

CHILE WITH MAURITIUS

9/25/95

Mauritius orders a 75 m patrol boat "designed to carry missiles" from Chile's Na-

val Docks and Yards (Asmar) in Talcahuano. The boat is scheduled to be ready on 5/10/96 and will cost between $20 to $22 million. According to Captain Hernan Barria, Asmar-Talcahuano's manager, Mauritius will use the boat to defend its "exclusive economic zone" and to "police" the region.

Patricio Gomes, *El Mercurio* (Santiago), 9/25/95, p. C6; in FBIS-LAT-95-198, 9/25/95 **(5441).**

CHILE WITH UNITED KINGDOM

9/6/95

Chile's Fabricaciones Militares (FAMAE) signs an agreement with British Aerospace's Royal Ordnance Division to produce the Rayo artillery rocket system through their co-owned FAMAE Ordnance Ltda. The cooperative agreement covers production of approximately 200 rockets, one launcher, and a fire control system. The initial systems will consist of two packs of 12 rockets with a maximum range of 40 km. Rayo will be produced and assembled in Chile, but the "strip laminated rocket casing" and the high explosive rocket warheads will be imported from the U.K. The 160 mm, 24-round Rayo system is fitted on-board a 3 X 6 Mercedes-Benz truck, but it can also be mounted on other types of chassis. The Chilean Army is expected to issue a production order for the Rayo system before the contract expires in 36 months.

Michael Sperling, *Defense News*, 9/18/95, p. 44 **(5586).** *Jane's Defence Weekly*, 9/16/95, p. 5 **(5586).**

COMMONWEALTH OF INDEPENDENT STATES (CIS)

CIS WITH FRANCE, SOUTH AFRICA, AND UNITED STATES

7/3/95*

Officials from South Africa's Overberg Toersbaan (OTB) test range are currently examining the possible establishment of cooperative space ventures with the U.S., France, and the CIS, so that OTB space launch facilities can be utilized fully.

Aviation Week and Space Technology, 7/3/95, pp.62-65 **(5479).**

COLUMBIA

INTERNAL DEVELOPMENTS

9/95*

Colombia allocates U.S. $108 million to modernize its navy; included in the program are upgrades to four Almirante Padilla class corvettes equipped with eight MM-40 Exocet missiles. Columbia also plans to acquire two new corvettes to operate on its Caribbean coast, and expresses an interest in former Soviet Osa II class missile attack ships.

Adrian English, *Jane's Intelligence Review*, 9/95, pp. 424-426 **(5589).**

COLOMBIA WITH RUSSIA

9/95*

Colombia is reportedly interested in acquiring SA-9, SA-11, and SA-13 missiles from Russia.

Adrian English, *Jane's Intelligence Review*, 9/95, pp. 424-426 **(5589).**

CROATIA

INTERNAL DEVELOPMENTS

Early 8/95

Before their launch sites are overrun by the Croatian Army, Croatian Serbs fire a FROG-7 (Luna-M) rocket at Zagreb from Knin.

Jane's Defence Weekly, 8/12/95, p. 3 **(5260).**

8/95

Croatian forces capture large quantities of Serbian military equipment, including Orkan multiple rocket launchers, during "Operation Storm" in northern Krajina. Croatian forces also capture 60 km-range SA-N-2 'Styx' sea-to-sea missiles from the Serbs outside Knin.

Igor Alborghetti, *Globus* (Zagreb), 8/18/95, p.2; in FBIS-EEU-95-165, 8/18/95 **(5564).**

CROATIA WITH RUSSIA

Late 5/95

Croatia displays four Russian-made SA-10 'Grumble' (S-300) missile tubes in Zagreb; Croatia acquired SA-10 air-defense systems despite the U.N. embargo on arms sales to the former Yugoslav republic. According to some sources, Croatia has a self-propelled SA-10B system, although NATO's electronic warfare forces have not detected any signs of the radar emissions associated with this system.

International Defense Review, 7/95, pp. 6, 9 **(5563).** David A. Fulghum, *Aviation Week & Space Technology*, 7/31/95, pp. 20-21 **(5609).**

CROATIA WITH UNITED STATES

7/95*

U.N. military observers report Croatia's use of U.S.-manufactured Gnat 750 RPVs in the Karlovac area and over Bihac in Bosnia. Croatia uses the RPVs to detect weak spots in Serb defenses in Western Slavonia. Controversy surrounds Croatia's acquisition of the Gnat 750 RPV because the CIA reportedly deployed them on the islands of Brac, before they were taken over by Croatia.

International Defense Review, 7/95, pp. 6, 9 **(5563).**

CZECH REPUBLIC

CZECH REPUBLIC WITH:
Belarus, NATO, Russia, and Ukraine, 161

ECUADOR

ECUADOR WITH:
Azores and Slovakia, 161

EGYPT

EGYPT WITH KUWAIT

7/29/95*

Kuwait is reportedly considering the purchase of Sakr-36 rocket launchers from Egypt's Arab Organization for Industrialization.

Jacques de Lestapis, *Jane's Defence Weekly*, 7/29/95, pp.26-32 **(5427).**

EGYPT WITH PRC

9/2/95*

Egypt maintains two Chinese-built Jianqhu frigates in their naval inventory; both ships are armed with HY-2 Silkworm ASMs.

James Bruce, *Jane's Defence Weekly*, 9/2/95, pp. 51-54 **(5395).**

EGYPT WITH SPAIN

9/2/95*

Egypt has two Spanish-built Descubierta class frigates armed with Harpoon ASMs.

James Bruce, *Jane's Defence Weekly*, 9/2/95, pp. 51-54 **(5395).**

EGYPT WITH UNITED STATES

8/21/95*

The U.S. approves the transfer of Harpoon missiles and surplus Knox and Perry-class warships to the Egyptian Navy.

Sharone Parnes, *Defense News*, 8/21/95, pp.4, 28 **(5308).**

9/2/95*

The U.S. is upgrading the Egyptian Navy's four Chinese-manufactured Romeo class submarines by fitting them with Harpoon ASMs, Mk 37 torpedoes, advanced fire-control systems, passive and active sonars, and data links. One of the submarines has already been upgraded and returned to service with the Egyptian Navy. Egypt is also leasing two Knox class frigates armed with Harpoon ASMs from the U.S.

James Bruce, *Jane's Defence Weekly*, 9/2/95, pp. 51-54 **(5395).**

EUROPEAN UNION

INTERNAL DEVELOPMENTS

7/1/95

Under new E.U. legislation, all export licenses for dual-use technology issued by an E.U. state will be valid in the 14 other member states. The new legislation will attempt to harmonize lists of exportable goods within the E.U. Although licenses will not be needed for most of the equipment on this list to move between member states, the state of origin may still need to be notified.

Jane's Defence Weekly, 7/15/95, p. 4 **(5264).**

FRANCE

FRANCE WITH:

FRANCE WITH IRAQ

10/13/95

U.N. and U.S. officials accuse Iraq of covertly purchasing missile-related components and technology, including a French-supplied $1 million furnace capable of manufacturing missile engine parts. UNSCOM head Rolf Ekeus asserts that Baghdad has also placed orders for other missile-related "technologies, supplies, and material" from abroad. U.N. officials assert that Iraq does not appear to have assembled any new Scud missiles, but has stockpiled and concealed materials, possibly to manufacture them in the future.

R. Jeffrey Smith, *Washington Post*, 10/14/95, pp. A1, A20 **(5423).**

FRANCE WITH GERMANY, ITALY, AND UNITED KINGDOM

10/23/95*

France, Germany and the U.K. are scheduled to sign an agreement in 11/95 to initiate joint development of the Principal Anti-Air Missile System (PAAMS). PAAMS will be fitted on-board their jointly developed Horizon frigate. PAAMS is based on the Future Surface-to-Air Family of missiles—which France and Italy have been developing since 1988—and will include the medium-range Sol-Air Moyenne Portee modified version of the Standard Missile. Although PAAMS and the Future Surface-to-Air Family of missiles do not have theater missile defense capabilities, France's Eurosam and a consortium of companies from the U.K., under the leadership of British Aerospace, are "conducting studies in this field."

Robert Holzer, *Defense News*, 10/23/95-10/29/95, p. 10 **(5565).**

FRANCE WITH GERMANY, ITALY, AND UNITED STATES

2/95

France, Germany, Italy, and the U.S. agree to develop the Medium-Range Extended Air Defense System (MEADS). Under the agreement, France's Aerospatiale and Thomson-CSF have a 20 percent stake in the missile project. Germany's DASA Siemens also has a 20 percent share, while Italy's Alenia has a 10 percent stake. MEADS is designed to defend against cruise missiles, UAVs, battlefield ballistic missiles, and aircraft.

O.P., *La Tribune Desfosses* (Paris), 8/11/95, p. 8; in FBIS-TAC-95-016-L, 9/1/95 **(5266).** *Flight International*, 10/25/95-10/31/95, p. 14 **(5352).** David A. Fulghum, *Aviation Week and Space Technology*, 10/30/95, p. 53 **(5438).** Mark Hewish, *International Defense Review*, 8/95, pp. 28-34 **(5632).**

8/95

France's General Delegate for Weapons Henri Conze expresses concern that the joint U.S.-European development of an anti-missile system is under threat due to a lack of U.S. Congressional support for the project.

O.P., *La Tribune Desfosses* (Paris), 8/11/95, p. 8; in FBIS-TAC-95-016-L, 9/1/95 **(5266).**

10/95

The U.S. Army chooses Lockheed Martin Integrated Systems Inc. and H & R Company (a joint venture involving Raytheon and Hughes Aircraft) to be the principal American contractors for the international MEADS project. Both U.S. concerns are expected to receive contracts in 1/96, after France, Germany, Italy, and the U.S. conclude a MEADS project MoU. After the MoU has been signed, each U.S. participant will join one of two European teams, both staffed with personnel from the French companies Aerospatiale and Thomson-CSF, the German firms Daimler-Benz and Siemens, and Italy's Alenia. The resultant two U.S.-European teams will compete during the MEADS project's "definition and validation phase," with one team progressing to the full-scale "design and development" stage in 1999.

Jane's Defence Weekly, 10/21/95, p.6 **(5352).** *Aviation Week & Space Technology*, 10/23/95, p. 21 **(5352).**

10/30/95*

According to critics, the MEADS system's ground-based radar has only a limited capability to detect low-flying missiles or aircraft because it is hindered by the Earth's curvature. In order to rectify this problem, researchers are considering mounting radar systems on unmanned helicopters and tethered balloons.

David A. Fulghum, *Aviation Week and Space Technology*, 10/30/95, p. 53 **(5438).**

France with Italy

6/95

France and Italy sign an MoU to manufacture the land-based SAMP/T air-defense system within the Future Surface-To-Air Family (FSAF) program. The SAMP/T is scheduled for deployment with the Italian and French Armies, and the French Air Force, in 1999. France's Aerospatiale and Thomson-CSF along with Italy's Alenia, have joined to form the Eurosam consortium which will develop, test and produce essential elements of the SAMP/T.

Mark Hewish, *International Defense Review*, 8/95, pp. 28-34 **(5632).**

France with Kuwait

7/29/95*

The Kuwaiti Navy considers the acquisition of Aerospatiale's 75 km-range Exocet MM-40 Block 2 (A) ASM to fulfil its Offshore Missile Vessel (OMV) SSM/ASM requirement. Kuwait currently deploys the Exocet MM-38/40 Block 1 aboard two Lurssen ships.

Jane's Defence Weekly, 7/29/95, pp. 34-36 **(5427).** E.R. Hooton, *International Defense Review*, 7/95, pp. 73-79 **(5427).**

France with Saudi Arabia

Mid-10/95

French Defense Minister Charles Millon discusses the possible sale of missiles and other military equipment with Saudi Arabian officials in Jeddah. Millon says King Fahd assured him that Saudi Arabia will approach France to fulfill some of its future military requirements.

Reuter, 10/15/95; Executive News Service, 10/16/95 **(5392).**

France with Taiwan

7/5/95

Taiwanese naval officials say six Lafayette-class missile frigates purchased from France may form part of a new anti-submarine flotilla, "Fleet 168," to be based at Chungcheng Naval Base in the northeastern city of Suao, Ilan County. Delivery of the frigates is expected to begin in late 1996.

Sofia Wu, CNA (Taipei), 7/5/95; in FBIS-CHI-95-151, 7/5/95 **(5550)**.

GERMANY

Internal Developments

4/95*

Germany plans to publish a list of developing world companies associated with the spread of missiles and weapons of mass destruction (WMD); however, due to intelligence and other considerations, the list will not include all companies believed to be involved in such activities. While Iranian, Iraqi, Libyan, and North Korean entities will be included, Bonn is reportedly hesitant to name companies in profitable market areas such as China, India, and Israel. Officials say German firms will need Federal Export Office permission to ship items to companies appearing on the list, which still awaits approval by the Foreign and Economic Ministries. In addition, the list will be published to help German companies comply with the E.U.'s new "catch-all" clause—scheduled to take effect in 7/95—that requires a firm to inform the government if it suspects its products will be used in WMD and missile production.

Risk Report, 4/95, pp. 1, 10 **(5611).**

10/95

Daimler-Benz Aerospace (DASA) warns the German government that the future of several key military programs under development, including the international Medium Range Extended Air Defense System (MEADS), could be placed in jeopardy if Bonn fails to commit firmly to the procurement of these systems.

Pierre Sparaco, *Aviation Week and Space Technology*, 10/30/95, pp. 26-27 **(5481).**

Germany with:

Germany with India

6/30/95*

India's Liquid Propulsion Systems Centre (LPSC) is paying 50 crore rupees to the German firm Linde for assistance in making liquid hydrogen at its liquid hydrogen production complex in Mahendragiri, near Tirunelveli in Tamil Nadu.

Raj Chengappa, *India Today*, 6/30/95, pp. 128-129; in FBIS-TAC-95-014-L, 6/30/95 **(5407).**

GERMANY WITH IRAQ

10/13/95

A U.N. official asserts that firms in Europe, including Germany, are among the suppliers of missile-related technologies and materials to Iraq. Iraq admits to obtaining some of the materials to support its Ibn al-Haytham missile research laboratory near Baghdad and two similar sites, but asserts the materials were intended for the manufacture of short-range missiles only, which is permitted under the U.N. embargo. According to U.N. officials, these materials could be utilized in the production of both short- and medium-range missiles.

R. Jeffrey Smith, *Washington Post*, 10/14/95, pp. A1, A20 **(5423).**

GERMANY WITH JAPAN AND UNITED STATES

10/23/95*

Japan includes the U.S.-German Rolling Airframe Missile system in its five-year defense plan.

Robert Holzer, *Defense News*, 10/23/95-10/29/95, p. 10 **(5565).**

GERMANY WITH:

MTCR, 182

GERMANY WITH NETHERLANDS AND NATO

8/95*

Germany and the Netherlands draw up a MoU to establish a joint "Patriot/Hawk cluster" to be deployed with NATO's Rapid Reaction Forces. The cluster will be deployed either on NATO's southern border or "out-of-area."

International Defense Review, 8/95, p. 9 **(5436).**

GERMANY WITH NETHERLANDS, NATO, AND UNITED STATES

10/95

NATO forces from Germany, the U.S., and the Netherlands conduct a TMD exercise over Denmark, Germany, the Benelux states, parts of France, and the North Sea, during the organization's annual "Cold Fire" exercise. The scenario involves Patriot SAM units from the Royal Netherlands Air Force, the German Luftwaffe, and the U.S. Army practising their local area defense roles against a simulated TBM attack. Allied Forces Central Command and the U.S. European Command's TMD cell collaborate to organize the scenario, which is similar to the U.S. Central Command's "Roving Sands" exercise of 5/95.

Jane's Defence Weekly, 10/7/95, p. 11 **(5354).**

GERMANY WITH NETHERLANDS AND UNITED STATES

Late 4/95-early 5/95

Ground-based air-defense units from Germany and the Netherlands participate for the first time in the "Roving Sands 95" air-defense exercise. The exercise takes place in New Mexico and western Texas, and involves live and simulated TBM operations to provide a forum for testing TMD capabilities of U.S. and allied forces within the Central Command.

Joris Janssen Lok, *International Defense Review*, 8/95 **(5474).**

GERMANY WITH RUSSIA

9/25/95*

The joint venture Eurorocket, formed by Daimler-Benz of Germany and Russia's Khrunichev State Research and Production Space Center, hopes to launch a satellite from a missile silo at the Baikonur cosmodrome in 10/96. In 1997, Eurorocket also plans to begin launching commercial payloads with Rockot SLVs from the Plesetsk cosmodrome in northern Russia. Rocket is a converted SS-19 missile.

Space News, 9/25/95-10/1/95, p. 18 **(5349).**

GERMANY WITH SYRIA

4/95*

Syria's Centre d'Etudes de Recherches Scientifiques (CERS) and its Higher Institute of Applied Science and Technology (HIAST) appear on Germany's export control watch lists. According to an official who monitors Germany's trade with sensitive countries, CERS and HIAST cooperate closely with one another. CERS is identified as an organization of concern in paragraph 5e of Germany's national trade law; all products destined to the center require a German export license. According to one German official, paragraph 5e only includes Syrian projects, but these may be removed if Syrian-Israeli relations improve.

Risk Report, 4/95, p. 11 **(5499).**

GERMANY WITH UNITED STATES

9/95

The German Ministry of Defense (MOD) requests $15.3 million (DM23 million) to finance the upgrade of 96 Patriot PAC-2 SAMs to Guidance Enhanced Missile (GEM) standard. The MOD plans to conclude a deal with the U.S. companies Raytheon and Allied Signal to perform the upgrade. According to the MOD, the GEMs will be capable of engaging TBMs at longer ranges and with greater success. The MOD intends to keep the GEMs in operation with Patriot PAC-3s, which it plans to acquire after 2001.

Jane's Defence Weekly, 9/16/95, p. 12 **(5353).**

HUNGARY

HUNGARY WITH ROMANIA

10/4/95

After a meeting with Hungarian Defense Minister Gyorgy Keleti, Romanian Defense Minister Gheorghe Tinca says that Bucharest wants to "get rid of its medium-range missiles." However, Tinca adds that it would cost more than $10 million to do so and that, in any event, Romania's weapons do not threaten Hungary. Tinca also meets deputies from the Hungarian Parliament's Defense and Foreign Affairs Committee who have been campaigning to have neighboring countries (such as Romania) copy Hungary by dismantling their "offensive medium-range missiles."

MTI (Budapest), 10/4/95; in FBIS-EEU-95-194-A, 10/4/95 **(5351).**

INDIA

INTERNAL DEVELOPMENTS

1/95

India's Nishant battlefield surveillance and reconnaissance UAV flies for the first time. The Nishant was previously known as the Falcon.

Flight International, 7/12/95-7/18/95, p. 16 **(5414).**

1/95*

According to the CIA, India is developing a lightweight nuclear warhead which it can deliver to Beijing on its Agni ballistic missile. India can also produce an ICBM if it modified its new space rocket into a SSM mode and developed a reliable long-range guidance system.

Risk Report, 1/95-2/95, pp. 3-9 **(5488)**

1/95*

A U.S. Department of Defense (DOD) study asserts that India remains deficient in several key technological areas in the missile field: guidance, navigation, computers, sensors, electronics, composites, and propulsion. New Delhi is looking to acquire lightweight, heat-resistant composite materials to manufacture rocket nozzles and motor cases. According to a U.S. State Department official, although India currently produces its own gyroscopes, it is seeking higher quality products to enhance the stabilization and accuracy of its missile systems. India also wants superior accelerometers to measure missile speeds more precisely, laser radars to enhance guidance capabilities, and integrated circuits for missile and rocket guidance systems. In terms of dual-use items, India seeks to import: oscilloscopes; torque motors; the aluminum alloy 2024-T3, together with protective coatings; ceramic chip capacitors; an FM signal generator; function generators; a video imaging module; software and equipment for designing optical systems; gas field effect transistors and bare semiconductor chips; and gear head DC motors with slewing ring bearings.

Risk Report, 1/95-2/95, pp. 3-9 **(5488)**

6/24/95*

Pakistani President Farooq Ahmad Khan Leghari says India's Prithvi, Agni, and intercontinental ballistic missile development programs may lead to an arms race on the subcontinent. Leghari says India's missiles are also causing problems for other countries because they can reach as far as China, Iran, Iraq, and Saudi Arabia.

PTV Television Network (Islamabad), 6/24/95; in FBIS-TAC-95-014-L, 6/24/95 **(5335).**

6/30/95*

G. Madhaven Nair replaces A.E. Muthunayagam as director of the Indian Space Research Organization's (ISRO) Liquid Propulsion Systems Centre (LPSC). The LPSC is currently developing a 7.5 ton-thrust cryogenic engine for the final stage of the Geosynchronous Satellite Launch Vehicle (GSLV). This cryogenic engine will use super-cooled liquid oxygen and hydrogen; accordingly, India must acquire the capability to handle temperatures ranging from -250 degrees celsius (during fuel storage) to 2,000 degrees celsius (in the engine's thrust chambers). India currently lacks the powdered metallurgy and special alloys required to allow the engine's thrust chambers, turbines, and tanks to withstand such extreme temperature variations. The cryogenic engine also requires 43,000 RPM turbo pumps that can tolerate extreme pressure and temperature changes. At present, India is only capable of developing a 15,000 RPM turbo pump for liquid fuels. LPSC scientists will also need to acquire the expertise necessary to fabricate the engine's injector unit, which features complex double valve systems, and to machine the tiny helical grooves required during the "regenerative cooling process" in the inner thrust chamber. The GSLV's first launch is scheduled for mid-1997.

Raj Chengappa, *India Today*, 6/30/95, pp. 128-129; in FBIS-TAC-95-014-L, 6/30/95 **(5407).**

7/95*

India's Pilotless Target Aircraft (PTA) has a 3 m wingspan, a 5.93 m fuselage, and a maximum speed of 0.8 Mach. The drone weighs 630 kg with two towed bodies and has an operational ceiling of 9,000 m. The aircraft is launched by a rocket booster fitted under its tail and is propelled when airborne by a 3,000 kg static thrust gas-turbine engine. The PTA is used for training pilots in air-to-air combat and for towing targets to train surface-to-air missile troops.

IDR Despatches, 7/95, p. 5 **(5408).**

7/12/95

Pakistani Foreign Minister Sardar Asif Ali announces that his country has sufficient proof to indicate that India has deployed its Prithvi ballistic missiles against Pakistan.

Xinhua (Beijing), 7/12/95; in FBIS-CHI-95-134, 7/12/95 **(5404).**

7/12/95*

India's Aeronautical Development Establishment anticipates that its domestically-produced Nishant UAV will be in use by the Indian Army in late 1996.

Flight International, 7/12/95-7/18/95, p. 16 **(5414).**

7/16/95

Dr. A.P.J. Abdul Kalam, scientific advisor to the Indian Defense Minister, tells Bharat Dynamics Limited (BDL) that India should continue to pursue self-reliance in missile technology, despite international pressure to the contrary. Kalam commends BDL for producing the Prithvi missile.

Deccan Chronicle (Hyderabad), 7/17/95, p. 7; in FBIS-NES-95-144, 7/17/95 **(5412).**

7/18/95

Following a U.S. government report that China had delivered M-11 missiles to Islamabad, an Indian government official says India will match Pakistan's new missile capability. Indian External Affairs Minister Pranab Mukherjee says New Delhi will be forced to increase its own missile stockpile to maintain the region's security balance.

UPI, 7/18/95; in Executive News Service, 7/19/95 **(5490).**

7/24/95

ISRO conducts a successful 200-second test-fire of an indigenously produced liquid fuel engine—developed by LPSC for the GSLV—at Mahendragiri in Tamil Nadu. The test evaluates the performance of the " silica-phenolic throat of the engine nozzle" that is

designed to withstand temperatures of 1,300 degrees centigrade during launch. According to LPSC Director Dr. G. Madhaven Nair, it is the first time the 60-ton engine has been subjected to a 200 second test-fire. Indian Prime Minister Narasimha Rao commends the chairman of the Indian Space Commission Dr. K. Kasturirangan for the successful indigenous development of liquid propulsion systems. Meanwhile, India's PSLV-D3 is reportedly being prepared for its next flight and is almost ready for launch.

Space News, 8/7/95-8/13/95, p. 16 **(5416).** S.K. Seshachandrika, All India Radio Network (Delhi), 7/26/95; in FBIS-NES-95-144, 7/26/95 **(5416).** All India Radio Network (Delhi), 7/25/95; in FBIS-NES-95-144, 7/25/95 **(5416).** Doordarshan Television Network (Delhi), 8/3/95; in FBIS-NES-95-153, 8/3/95 **(5416).**

7/25/95*

India initiates full-scale Prithvi production and the Army asks the Ministry of Defence for 100 of the missiles.

Jang (Rawalpindi), 7/25/95, p. 10; in FBIS-NES-95-145, 7/25/95 **(5324).**

7/28/95*

According to an editorial in Pakistan's *Jang*, India is in the final stages of manufacturing and testing the Surya ICBM, which is reported to have a range of between 12,000 and 20,000 km.

Jang (Rawalpindi), 7/28/95, p. 3; in FBIS-TAC-95-004, 7/28/95 **(5403).**

8/95*

India's Defence Research and Development Organization (DRDO) modifies a road-mobile BMP-2 infantry combat vehicle to transport and launch three Akash SAMs. The BMP-2 has a rotatable launcher with the Akash SAM mounted in the ready-to-launch position. The Akash's "multi-function 3D phased array radar" and its missile command post vehicle are also fitted on the modified BMP-2 chassis.

Jane's Intelligence Review Pointer, 8/95, p. 5 **(5415).**

Early 8/95

Indian Defence Minister Achutan Nambiar announces that, depending on strategic circumstances, the Agni IRBM may be deployed with the Indian military. According to DRDO sources, the Agni test program has cost $11.6 million to date. The next phase, which will involve the manufacture of five missiles, will cost an additional $16.6 million.

Farhan Bokhari and Vivek Raghuvanshi, *Defense News*, 8/28/95, pp. 1, 20 **(5405).**

8/3/95*

India's 150 km- and 250 km-range Prithvi missiles will be deployed with the Indian Army. Both versions are liquid-fueled and are capable of delivering 1,000 kg and 500 kg warheads respectively.

The Asian Age (Delhi), 8/3/95, p. 13; in FBIS-TAC-95-016-L, 8/3/95 **(5327).**

8/22/95

Pakistani Prime Minister Benazir Bhutto asks Western nations to pressure India to stop Prithvi and Agni development; Bhutto believes the missiles constitute a nuclear threat to the region.

Farhan Bokhari and Vivek Raghuvanshi, *Defense News*, 8/28/95, pp. 1, 20 **(5405).**

8/24/95

A report from India's Parliamentary Standing Committee on Defence asserts that India must continue its missile program due to China's indigenous missile improvements and to Beijing's assistance to Pakistan in the missile area. The report says the Prithvi missile has been developed and is ready to be incorporated into the military. India's development of the Trishul, Akash, and Agni missiles should reportedly be finished by 1995-96. The committee also hopes that India's Integrated Guided Missile Development Progam will develop "high-caliber" missile technology in the near future. According to the report, MTCR restrictions have promoted India's self-reliance in missile production, and therefore New Delhi no longer depends on other countries for its missile technology.

Dainik Jagran (Delhi), 9/4/95, p. 11; in FBIS-NES-95-176, 9/4/95 **(5420).** Farhan Bokhari and Vivek Raghuvanshi, *Defense News*, 8/28/95, pp. 1, 20 **(5405).**

8/24/95

The Indian Parliament's Standing Committee on Defence states that the $45.3 million Integrated Electronic Warfare Program (IEWP) and the Samyukta electronic warfare program will be united and managed by the DRDO. According to a government source, the project includes indigenous production of carbon-carbon materials with primary dependence on technology transfer and "concurrent engineering of foreign-developed parts." The DRDO project will focus on electronic warfare capabilities and defensive arms designed to "deflect and destroy incoming missiles."

Vivek Raghuvanshi, *Space News*, 9/4/95, p. 9 **(5410).**

8/21/95*

India's four-stage, solid-fuel, Augmented SLV (ASLV), and its solid/liquid-fuel, four-stage Polar SLV PSLV, enter the commercial space launch market.

Aviation Week and Space Technology, 8/21/95, p. S6 **(5426).**

8/27/95

Pakistani President Farooq Ahmad Khan Leghari tells U.S. Senators Hank Brown and Arlen Specter that India's Prithvi missile is "Pakistan specific." Leghari adds that India's Prithvi production and its Agni missile development program have precipitated a regional arms race.

The Muslim (Islamabad), 8/28/95, p. 1; in FBIS-NES-95-167, 8/28/95 **(5413).**

8/29/95

The DRDO will cut 618 "small and medium projects" in order to focus on more important weapons-related projects, including its missile program. An Indian Defense Ministry official says the DRDO will remain responsible for the integrated missile program and the integrated electronic warfare project. DRDO seeks a 191 Rs crore increase from its 1994-1995 budget of Rs 1185 crore to finance, among other items, "the induction" of Prithvi and Trishul missiles.

Business Standard (Delhi), 8/29/95, p. 2; in FBIS-TAC-95-005, 8/29/95 **(5388).**

8/29/95

Pakistani Prime Minister Benazir Bhutto says that India's missile production program must be restricted because it threatens Pakistan and the region as a whole. Bhutto states that although India's missile program is "Pakistan-specific," it also poses a nuclear threat to Iran, Iraq, Kuwait, Saudi Arabia, and Yemen.

Reuter, 8/29/95; in Executive News Service, 8/29/95 **(5324).**

Early 9/95

The Indian Cabinet approves a Ministry of Defence sponsored plan creating a Defence Exports Board to boost international sales of indigenously manufactured weapons. Administration of the new board will be modeled on the Antrix Corporation of Bangalore, the commercial division of ISRO. According to government sources, a director for the new board will be appointed by the end of 1995. The Indian Cabinet is still considering the scope of the board's authority. Brigadier Jasjit Singh, an "Indian Army acquisition official," says the Defence Export Board will sell weapons and technology produced by the DRDO, state-owned defense manufacturers, and ordnance factories.

Vivek Raghuvanshi, *Defense News*, 10/16/95, p. 42 **(5489).**

Early 9/95

According to the Indian Defence Ministry, Delhi's continuation of the Agni missile project is essential in view of Beijing's missile program and China's missile-related assistance to Pakistan. The Indian government is reportedly evaluating its future defense requirement for the Agni missile, following the successful test of the Agni-03 re-entry vehicle.

Dainik Jagran (Delhi), 9/4/95, p. 11; in FBIS-NES-95-176, 9/4/95 **(5420).**

9/11/95*

India's long-term defense export plans are reported to include the future sale of its medium-range Akash and Trishul missiles, and the Rajendra radar.

Vivek Raghuvanshi, *Defense News*, 9/11/95-9/17/95, p. 6 **(5337).**

9/27/95

Pakistani Foreign Minister Sardar Aseff Ahmad Ali tells the U.N. General Assembly that India's missile stockpile and naval strength are a source of great anxiety for Pakistan.

Reuter, 9/27/95; in Executive News Service, 9/27/95 **(5398).**

10/7/95*

According to a DRDO official, Hyderabad's Bharat Dynamics Limited is again producing the Prithvi missile; the program was halted earlier in 1995 under U.S. pressure to do so. Military sources in New Delhi say that, to date, the Indian Army has taken delivery of 18 to 20 Prithvis. The DRDO has developed a simulator advanced enough to train Prithvi operators in the 333rd missile regiment to manage "in-flight emergencies." According to a DRDO official, the Prithvi will not be deployed with the Indian Air Force until its deployment with the army is complete.

Rahul Bedi, *Jane's Defence Weekly*, 10/7/95, p. 17 **(5399).**

10/11/95*

India plans to launch the indigenously produced IRS-P3 satellite using the PSLV in 1995. The 930 kg satellite will be launched from the Shriharikota launch site on the PSLV's third development flight.

Flight International, 10/11/95-10/17/95, p. 24 **(5338).**

10/15/95*

According to defense sources, the assimilation of the Prithvi SRBM into the Indian Army is proceeding well. The DRDO is also developing a longer-range Prithvi missile that can be fitted on-board ships and other moving platforms. The modified Prithvi might be deployed with India's Air Force and Navy.

All India Radio Network (Delhi), 10/15/95; in FBIS-NES-95-199, 10/15/95 **(5328).**

10/23/95*

According to defense and industry sources, a "radar-absorbent coating" developed for India's fighter aircraft will also be used in its missile and launch vehicle programs. The coating was developed by the DRDO's Composite Material Research Laboratory in Hyderabad and has already been applied to operational aircraft.

Vivek Raghuvanshi, *Defense News*, 10/23/95-10/29/95, pp. 1, 44 **(5331).**

INDIA WITH:

Brazil, Israel, and PRC, 164
Germany, 167

INDIA WITH ISRAEL

8/94

An Indian Army team tests the Hunter and Seeker RPVs in Israel; the team is reportedly satisifed with the vehicle's performance.

Pravin Sawhney, *The Asian Age* (Delhi), 7/4/95, p. 1; in FBIS-NES-95-135, 7/4/95 **(5494).**

3/95

Israeli Aircraft Industries (IAI) signs a $50 million contract with the Indian Air Force to supply the Harpy anti-radiation drone.

Flight International, 7/19/95-7/25/95, p. 14 **(5270).**

Early 7/95

A high-level Indian delegation, including Defence Secretary Achutan Nambiar, visits Israel to discuss the final details of a technology transfer package. The package includes IAI's "reconnaissance and anti-radiation" UAVs, including the Searcher UAV that incorporates an "advanced day/night optronic payload."

Vivek Raghuvanshi and Michael J. Witt, *Defense News*, 7/10/95, pp. 3, 28 **(5494).** *Flight International*, 7/19/95-7/25/95, p. 14 **(5270).**

7/3/95

A DRDO official states that the Indian Defence Ministry will buy approximately 32 Searcher UAVs and two related ground control systems from Israel. India is reportedly seeking to acquire the Searcher UAVs because they are designed to conduct real-time surveillance over enemy territory and could be used to ensure the optimum performance of Prithvi missiles. The equipment—estimated to be worth approximately $30 million—could be transferred to India by 1998 if an agreement is reached soon. The official says the technology transfer will allow India to indigenously produce a version of the UAV. India is also reportely seeking Israeli help for DRDO's Falcon remotely piloted vehicle (RPV), re-named the Nishant, which has failed to meet the Indian Army's technical requirements. The UAV package under negotiation was preceded by an Indian contract to purchase the Harpy anti-radiation drone from IAI. According to Indian sources, the approximately $50 million Harpy contract includes 16 of the 2.5 meter-long, delta-wing shaped

drones. The Harpy has a 100 kg takeoff weight and is fitted on-board a mobile launcher.

Vivek Raghuvanshi and Michael J. Witt, *Defense News*, 7/10/95, pp. 3, 28 **(5494).** Pravin Sawhney, *The Asian Age* (Delhi), 7/4/95, p. 1; in FBIS-NES-95-135, 7/4/95 **(5494).** *Jane's Defence Weekly*, 9/30/95, p. 17 **(5494).**

INDIA WITH:

MTCR, 181

INDIA WITH PAKISTAN AND UNITED STATES

7/31/95

India's Minister for External Affairs Pranab Mukherjee voices concern over the U.S. proposal to transfer 28 Harpoon SSMs and three P-3C anti-submarine aircraft to Pakistan.

Vivek Raghuvanshi, *Defense News*, 8/7/95-8/13/95, p. 12 **(5329).**

9/95*

A U.S. Arms Control and Disarmament Agency (ACDA) report criticizes the "unguarded" ballistic missile and nuclear programs of both India and Pakistan. The report warns that the programs contribute to the chances of nuclear weapons being used in any future conflict on the Subcontinent and asserts that the U.S. is resolved to stop the transfer of missiles and nuclear weapon-related technology to India and Pakistan.

Asian Defence Journal, 9/9/5 **(5455).**

INDIA WITH PRC

Mid-8/95

During talks between China and India concerning maintenance of peace on the Indo-Chinese border, India raises the issue of Chinese sales of M-11 SSMs to Pakistan. China responds that its arms transfers to Pakistan have been small in number.

A.J. Philip, All India Radio Network (Delhi), 8/21/95; in FBIS-NES-95-162, 8/21/95 **(5293)**.

INDIA WITH RUSSIA

7/95*

India and Russia plan to jointly develop a "multi-purpose spacecraft" that will incorporate a gamma-ray telescope. The system is scheduled for launch in 1997.

Flight International , 7/26/95-8/1/95, p. 20 **(5636).**

8/2/95

Aleksandr Belikov, deputy head of the Russian Foreign Economic Relations Ministry's Asia Department, announces that Russia will not sell missile technologies to India but will instead supply ISRO with several cryogenic boosters for its SLVs. Belikov says the majority of India's imports from Russia will be military-related in 1995-1996.

Aleksandr Korzun, Igor Porshnev, and Yevgeniy Terekhov, Interfax (Moscow), 8/2/95; in FBIS-SOV-95-149, 8/2/95 **(5636).**

8/3/95

Indian Foreign Minister Pranab Mukherjee arrives in Russia for a three-day visit. According to Yuriy Kotov, director of the Russian Foreign Ministry's Third Asian Department, the trip is designed only to "compare notes on the whole range of bilateral and international problems."

Vladimir Abarinov, Segodnya (Moscow), 8/4/95, p. 9; in FBIS-SOV-95-152, 8/4/95 **(5636).**

Early 9/95

Indian Defence Secretary Achutan Nambiar is reportedly unable to secure acquisition of S-300 antiaircraft systems, and other defense equipment, from Russia.

Jason Glashow and Vivek Raghuvanshi, *Defense News*, 9/18/95-9/24/95, p. 6 **(5397).**

INDIA WITH UNITED KINGDOM

9/7/95

Kishore Banerjee, vice president for liaison of India's Nippon Denro Ispat Ltd. (NDIL), says that NDIL and the U.K.'s GEC-Marconi are considering the establishment of a "defense electronic equipment facility" in India. GEC-Marconi reportedly wants to cooperate with NDIL in the joint development of avionics, radar, guided weapons, fire control systems, electronic warfare systems, display technology, and systems integration.

Michael Sperling, *Defense News*, 9/11/95-9/17/95, p. 44 **(5326).**

INDIA WITH UNITED STATES

1/95*

A State Department official says the U.S. recently sold ring laser gyroscopes to India for use on its fighter aircraft but adds that the instruments cannot easily be adapted for use in missile programs.

Risk Report, 1/95-2/95, pp. 3-9, **(5488).**

Spring 1995

A U.S. federal court convicts Fiber Materials Inc.'s Chief Executive Officer Walter Lachman and President Maurice H. Subilia for transfer of a hot isostatic press control panel to India's DRDO; the press is used in the production of the Agni missile. To circumvent U.S. export laws, Lachman and Subilia arranged to manufacture the isostatic press in Europe and to have it subsequently shipped to India, along with the U.S. personnel to assemble it. Both Lachman and Subilia are found guilty of violating the Export Administration Act and are scheduled to be sentenced on 10/17/95. According to Michael Schneider, an associate defending the executives, the DRDO pledged to use the press to produce biomedical prosthetics and brake-linings for commerical aircraft. According to a senior U.S. official, the isostatic press was designed specifically for manufacturing weapons, and its export was restricted for reasons of national security. The MTCR restricts the transfer of isostatic presses that can function at temperatures of at least 600 degrees centigrade and that have an internal diameter of 10 inches or greater. Presses of this type are deemed suitable for producing missile bodies, nozzles, and nose cones.

Risk Report, 10/95, pp. 10-11 **(5487).** *The Export Practitioner*, 7/31/95, p. 14 **(5322).**

8/3/95*

Under U.S. pressure, India scraps plans to develop a 1,000 km-range, solid-fuel Prithvi missile capable of delivering a 500 kg warhead. The Indian Air Force requested the 1,000 km-range Prithvi in 1991 to obtain a conventional missile capable of hitting targets in China.

The Asian Age (Delhi), 8/3/95, p. 13; in FBIS-TAC-95-016-L, 8/3/95 **(5327).**

11/1/95*

India's Bangalore-based National Aerospace Laboratories (NAL) is given a $130,000 contract by the U.S.'s Boeing to study "aircraft damage tolerance." NAL has an ISRO-built aerospace establishment and a "scientific computing division" that focuses on "computational fluid dynamics, computerized flight-control systems, and structural analysis." The contract is the first of its kind awarded to an Indian firm.

Flight International, 11/1/95-11/7/95, p. 24 **(5493).**

IRAN

INTERNAL DEVELOPMENTS

10/95

According to the International Institute of Strategic Studies (IISS), Iran's 300-km range SSMs can target the cities of Al Jubayl in Saudi Arabia and San'a in Yemen. The IISS reports that these missiles can also target sites in Bahrain, Qatar, Abu Dhabi, Dubai, and Muscat.

The Military Balance 1995-1996, 10/95, pp. 281-285 **(5569).**

10/16/95

Ayatollah Ali Khamenei says Iran is manufacturing "advanced electronic warfare equipment." This claim was prompted either by U.S. military activity in the Middle East or by problems which the U.S. ban on dual-use technology trade with Iran might be causing Tehran.

Jane's Defence Weekly, 10/28/95, p. 19 **(5570).**

IRAN WITH:

Belarus, 161
Bosnia and Russia, 162

IRAN WITH IRAQ AND SUDAN

10/95

Muhammed al-Mu'tasim, the Sudanese Democratic Opposition Party's official in charge of information, claims that Iranian and Iraqi engineers, including some missile experts, are helping to upgrade an old airfield in East Sudan. Al-Mu'tasim says this indicates Sudan's intention to target all countries around the Red Sea with its naval and air forces.

MENA (Cairo), 10/23/95; FBIS-NES-95-205, 10/23/95 **(5475).**

IRAN WITH LIBYA

5/2/95

According to Israeli sources, Libya assisted Iran in acquiring conventional warhead technology to upgrade its No-dong-1 missiles to four times the explosive power of Scud-Bs.

Adel Darwish, *Independent* (London), 5/2/95, p. 10; FBIS-TAC-95-003, 5/2/95 **(5271)**.

IRAN WITH NORTH KOREA

5/2/95

According to an Israeli intelligence report, North Korea has sent a dozen or more No-dong-1 missiles to Iran. Also referred to as the Scud-D, the No-dong-1 is said to have a range of 1,500 km (900 miles) and could target almost all of Israel from Iran. In addition, North Korea has sold over 200 Scud-B missiles to Iran.

Adel Darwish, *Independent* (London), 5/2/95, p. 10; FBIS-TAC-95-003, 5/2/95 **(5271)**.

5/29/95-6/2/95

During a visit to Iran by North Korean Foreign Minister Kim Young-nam, Iran reportedly proposes to pay in oil for $300 million worth of Scud missiles previously purchased from the DPRK.

Iran Brief, 8/1/95, p. 6 **(5531)**.

8/95

According to Israeli sources, before it recently halted its development efforts, North Korea intended to export the 1,000+ km-range (540 nm) No-dong to Iran and may have already shipped some No-dong technology. North Korea is now helping Iran build a production facility for Scud-B and Scud-C missiles.

Flight International, 8/30/95-9/5/95, p. 4 **(5272)**.

IRAN WITH NORTH KOREA AND SOUTH KOREA

6/24/95

The Korea Trade Promotion Corporation (KOTRA) says it mistakenly reported Iran's having received missiles from North Korea in exchange for oil. The story was reported in the *Korea Times* a week earlier. KOTRA spokesman Cho Tae-hyong expresses the hope that this error would not adversely affect the longstanding good relations between Iran and South Korea.

Korea Times (Seoul), 7/25/95, p. 8; in FBIS-EAS-95-142, 7/25/95 **(5284)**.

IRAN WITH PRC

7/3/95*

According to U.S. intelligence reports, China has exported sophisticated missile guidance systems and other equipment to Iran. The equipment could enable Iran to improve the accuracy of its Scud missiles and to produce other missiles.

Evan S. Medeiros, *Arms Control Today*, 7/95-8/95, p. 24 **(5282)**.

7/7/95*

China plans to supply Iran with nuclear reactors, scientific and technical training, expertise, and components for missile production.

Aluf Ben, *Ha'aretz* (Tel Aviv), 7/7/95, p. B1; in FBIS-NES-95-133, 7/7/95 **(5277)**.

IRAN WITH UNITED STATES

1/95*

The U.S. Bureau of Export Administration receives reports regarding several Iranian companies seeking to purchase sensitive technology from U.S. firms.

Risk Report, 1/95-2/95 **(5625).**

IRAQ

INTERNAL DEVELOPMENTS

6/18/95*

The Iraqi News Agency (INA) claims that UNSCOM has destroyed 140 Scud and Al-Hussein missiles, 18 mobile launchers, 40 fixed launchers, 15 buildings, and 150 pieces of equipment. INA also says that UNSCOM has destroyed 75 ballistic missiles armed with chemical warheads.

Leon Barkho, Reuter, 6/18/95; in Executive News Service, 6/18/95 **(5577).**

Early 7/95

UNSCOM head Rolf Ekeus informs the Security Council that Iraq has procured machinery for manufacturing U.N.-prohibited missile systems.

Barbara Crossette, *New York Times*, 7/9/95, p. 7 **(5309).**

7/7/95

Nizar Hamdoon, Iraq's representative to the U.N., requests that the Security Council delay the destruction of five pieces of machinery that could be used to manufacture ballistic missiles. The letter indicates that Baghdad wants to postpone the destruction until the issue of Iraq's biological weapons is resolved. The machinery has already been disabled and disassembled, but has yet to be destroyed.

Barbara Crossette, *New York Times*, 7/9/95, p. 7 **(5309).**

7/19/95

The Security Council reports that Iraq has agreed to destroy five pieces of machinery used to manufacture banned missile engines.

New York Times, 7/20/95, p. A4 **(5659).**

7/20/95

According to U.N. officials, Iraq begins destroying the five machine tools at an undisclosed location.

James Bruce, *Jane's Defence Weekly*, 7/29/95, p. 13 **(5431).**

7/24/95

U.N. spokesman Tim Trevan says Iraq has destroyed five pieces of equipment which it once employed in the manufacture of banned missiles engines.

Reuter, 7/24/95; in Executive News Service, 7/24/95 **(5659).**

7/29/95*

The U.S. has satellite photographs indicating that Iraq has rebuilt its al-Kindi missile research and development facility since the Gulf War of 1991.

James Bruce, *Jane's Defence Weekly*, 7/29/95, p. 13 **(5431).**

Mid-8/95

Two senior Iraqi defectors allege that Baghdad intentionally misled U.N. inspectors regarding the number of SS-1 'Scud' SRBMs which Iraq retained after the Gulf War of 1991. The two defectors, Iraqi military-industries minister General Hussein Kamel Hassan and his brother Lieutenant Colonel Saddam Kamel Hassan, were both involved in Baghdad's efforts to acquire a long-range ballistic missile capability prior to their departure from Iraq on 8/8/95. Recent estimates say Iraq may be hiding between five and 13 mobile Scud launchers, and a number of missiles, underground.

Flight International, 8/23/95-8/29/95, p. 16 **(5305).**

8/18/95

On Israel Television's Channel 1, an unnamed leader of the Iraqi opposition exiled in London claims that Baghdad retains 37 operational Scud missiles. The unnamed individual predicts that, if his regime collapses, Saddam Hussein will launch these missiles against Israel in a "farewell barage."

Ma'ariv (Tel Aviv), 8/20/95, pp. 1, 2; in FBIS-NES-95-162, 8/20/95 **(5660).**

8/19/95

Iraq provides UNSCOM with fresh information on its ballistic missile program. According to Ambassador Rolf Ekeus, the Special Commission is evaluating the new data.

Leon Barkho, *Washington Times*, 8/20/95, p. A8 **(5568).**

8/23/95

Ambassador Ekeus says that all of Iraq's long-range missiles have been accounted for and that Baghdad no longer poses a threat to its neighbors in this respect.

Jordan Times (Amman), 8/24/95, pp. 1, 7; in FBIS-NES-95-164, 8/24/95 **(5663).**

8/25/95

Ambassador Ekeus tells the Security Council that Iraq put three types of biological agent into approximately 200 missile warheads and bombs prior to the Gulf War of 1991. In 12/90, these weapons were deployed to air bases and a missile site. Iraq also claims to have put botulinum toxin and anthrax bacteria into 25 warheads, which were capable of being deployed aboard its medium-range Al-Hussein missiles. According to *Liberation* of Paris, Iraq's 12/90 arsenal of biological weapons included 50 bombs and 12 warheads filled with anthrax culture media, along with 100 bombs and 50 warheads loaded with botulism culture media. Ekeus also reports that Iraq has admitted to developing drones/unmanned aircraft to deliver biological agents.

R. Jeffrey Smith, *Washington Post*, 8/26/95; in Executive News Service, 8/26/95 **(5428).** Luc Lampriere, *Liberation* (Paris), 8/29/95, p. 7; in FBIS-NES-95-168, 8/29/95 **(5428).**

8/26/95*

According to Harvard University's Matthew Meselson, Iraq approached two European firms in the late 1980s to design a warhead with a restraining parachute for its Al-Hussein missile. Meselson says that for the effective delivery of anthrax particles capable of killing people and animals over an area of a few miles, a slow moving delivery vehicle is required.

Barbara Crossette, *New York Times*, 8/23/95, pp. A1, A6 **(5665).**

9/95

Iraq tells UNSCOM that it had previously produced its own Scud missile engines through reverse-engineering. Before the revelation, it was widely believed that the only Scud engines available to Iraq had been Soviet-supplied. Prior to the 1990-1991 Gulf crisis, Iraq was known to be capable of manufacturing its own Scud airframes. During the Gulf War, these poorly built air-

frames frequently broke apart upon descent.

Allan George, *Flight International*, 9/20/95-9/26/95, p. 19 **(5430).**

9/95

Charles Duelfer, deputy executive chairman of UNSCOM, says that Baghdad recently surrendered documents revealing that Iraq previously manufactured Scud rocket motors and flight-tested chemical warheads. Duelfer says Iraq employed a live chemical agent in one of the flight tests, but he did not reveal the location of the test-site. According to Duelfer, the new data will influence UNSCOM's accounting for Iraq's Scud missile warheads.

Jane's Defence Weekly, 9/30/95, p. 4 **(5567).**

10/11/95

Ambassador Ekeus submits his semi-annual report to the Security Council. Ekeus accuses Baghdad of deceiving his inspectors regarding the actual progress which Iraq had made on its ballistic missiles and chemical and biological weapons. According to the report, Iraq had conducted "chemical missile warhead flight tests," had indigenously manufactured Scud missile engines, and had attempted to deploy a nuclear device in 1990. According to Ekeus, Iraq said in 1992 that it had destroyed 89 Scud/Al Hussein missiles, although in fact only 83 were destroyed. According to Ekeus, Iraq revises its earlier claim to have destroyed 100 bacteriological and chemical warheads for the Al-Hussein missile to 75. UNSCOM also reports that Iraq has again begun to manufacture components for missile engines. According to the Special Commission, Baghdad had deployed 191 bacteriological and chemical weapons to two air bases in Iraq: 25 warheads for the Al-Hussein missile and 166 bombs for aircraft delivery. The U.N. says 113 of these weapons contained botulin, 60 were armed with anthrax, and 18 carried aflatoxin.

New York Times, 10/14/95, p. 5 **(5433).** Lyndsay Griffiths, Reuter, 10/11/95; in Executive News Service, 10/13/95 **(5433).** Evelyn Leopold, *Washington Post*, 10/12/95; in Executive News Service, 10/12/95 **(5433).** Evelyn Leopold, *Washington Times*, 10/12/95, p. A17 **(5566).** UPI, 10/13/95; in Executive News Service, 10/13/95 **(5578).** Mario R. Dedreichs, *Stern* (Hamburg), 10/12/95, pp. 230-232; in FBIS-NES-95-198, 10/12/95 **(5435).**

IRAQ WITH:
France, 166
Germany, 168
Iran and Sudan, 173

IRAQ WITH LIBYA

1/95

Saddam Hussein and Muammar Qadhdhafi agree on a technical exchange to develop a long-range missile at a secret Libyan location. Libya is responsible for acquiring Western technology, for paying wages, and for providing "whatever" it has already achieved with Iran in the missile development field. Libya's missile production plans apparently include the development of a 500 km-range missile (with Iranian assistance) and a 1,000 km-range missile. Progress on these systems has been hampered by the U.N. embargo and by technical problems. Thus, Tripoli has turned to Baghdad for assistance; Iraq has now provided Libya with information on its Al-Hussein and Badr ballistic missiles.

Guido Olimpio, *La Repubblica* (Rome), 5/5/95, p. 13; in FBIS-TAC-95-003, 5/5/95 **(5307).**

IRAQ WITH RUSSIA

9/95*

Russia has previously exported the 150-km range Tupolev Reys (Voyager) UAV to Iraq.

IDR Despatches, 9/95, p. 3 **(5453).**

10/13/95

U.N. and U.S. officials accuse Iraq of covertly purchasing missile components from Russia, via a sophisticated network of purchasing agents and dummy companies. Senior U.S. officials express concern over Russia's sale of missile-related items to Iraq, in an apparent bid by Moscow to re-initiate its arms provider relationship with Baghdad. Iraq is accused of obtaining accelerometers, gyroscopes, and special metals. UNSCOM head Rolf Ekeus asserts that Baghdad has also placed orders for other missile-related technologies, supplies, and material. U.N. officials assert that Iraq does not appear to have assembled any new Scud missiles, but has stockpiled and concealed materials, possibly to manufacture them in the future. Iraq admits to obtaining some of the materials to support its Ibn al-Haytham missile research laboratory near Baghdad and two similar sites, but asserts the materials were intended for the manufacture of short-range missiles only, which is permitted under the U.N. embargo. According to U.N. officials, these materials could be utilized in the production of both short- and medium-range missiles. According to the head of the Strategic Investigations Office of the U.S. Customs Service Connie Fenchel, Iraq is perservering in, and possibly intensifying, its efforts to acquire missile-related technology which is embargoed by the U.N.

R. Jeffrey Smith, *Washington Post*, 10/14/95, pp. A1, A20 **(5423).**

IRAQ WITH UKRAINE

10/13/95

A U.N. official accuses Iraq of covertly purchasing missile-related technology from Ukraine.

R. Jeffrey Smith, *Washington Post*, 10/14/95, pp. A1, A20 **(5423).**

ISRAEL

INTERNAL DEVELOPMENTS

1/95

Uzi Rubin, the chief of the Israeli Missile Defense Office, says that the Arrow-2 ATBM will be tested six times during the next 18 months.

James Bruce, *Jane's Intelligence Review*, 8/95, pp. 352-354 **(5615).**

4/5/95

Israel uses its Shavit SLV to launch the Ofeq-3 imaging satellite. According to Israeli press reports, the Shavit incorporates a new, small 674 lb thrust rocket engine, which was produced by Israeli Aircraft Industries (IAI). The Shavit is based on Israel's Jericho ballistic missile. TAAS (formerly Israel Military Industries) manufactures the Shavit's first two solid rocket motors, while Rafael manufactures the titanium-skinned, two-ton, third-stage motor.

Gerald M. Steinberg, *International Defense Review*,

10/95, pp. 20-23 **(5575).** James Bruce, *Jane's Intelligence Review*, 8/95, pp. 352-354 **(5615).**

6/95*

Israel is reportedly interested in obtaining technology to improve the accuracy of its Jericho ballistic missile. According to the U.S. Department of Defense's Militarily Critical Technology List (MCTL) of 1992, Israel lacks several unique devices for fabricating and inspecting components for gyroscopes and integrated sensor systems and lacks the means to produce high-precision bearings.

Risk Report, 6/95, p. 9 **(5422).**

6/95

Israel's Silver Arrow unveils its Darter and Colibri UAVs at the Paris Air Show. The Darter UAV is 3.97 m long, has a wingspan of 4 m, a takeoff weight of 100 kg, a top speed of 100 kt, and a maximum operational radius of 50 m. The 2.63 m long Colibri UAV is intended primarily as a pilot training vehicle. The Colibri has a wingspan of either 2.98 m or 3.85 m, and has a takeoff weight of 36 kg. Silver Arrow also exhibits two of its Hermes UAVs. The Hermes 450 is 10 m in length, weighs 450 kg, and uses a 76 hp engine. The improved Hermes 750 uses a 104 hp engine, has a 750 kg takeoff weight, and can remain airborne for over 30 hours at 200 km from base.

IDR Despatches, 7/95, p. 2 **(5312).**

6/25/95*

Israel's Defense Ministry is financing the development of a UAV-launched anti-missile interceptor to engage Scud-type TBMs in the boost phase. Firms developing UAVs in Israel include Elbit Ltd. of Haifa, BTA Automatic Piloting Systems Ltd of Hod Hasharon, and Malat Division of Israel Aircraft Industries (IAI), Lod. IAI's Heron UAV holds the world endurance record of 51 hours and 21 minutes. IAI's Washington director Marvin Klemow says his company has displayed the ability to fly UAVs to an altitude of 30,000 ft.

Sharone Parnes, *Defense News*, 7/3/95-7/9/95, p. 8 **(5269).**

6/25/95

Major General Herzle Bodinger, commander of the Israeli Air Force, says Israel will not procure or deploy the Arrow anti-missile interceptor in large quantities. The Israeli Ministry of Defense has allocated approximately $1.2 billion, over the next five years, to purchase and deploy Arrow interceptors, missile launchers, fire control radars, and the associated battle management and command systems.

Sharone Parnes, *Defense News*, 7/3/95-7/9/95, p. 8 **(5269).**

7/30/95

Israel conducts its first launch of the Arrow-2 ATBM to test the missile's propulsion, guidance and sensor systems and to evaluate its ground launch capability. The Arrow-2 reaches an altitude in excess of 20 km and fulfills its target acquisition and tracking functions as planned; the launch was not designed to test the Arrow-2's interception capabilities and will be followed by another test later in 1995. The Arrow-2 is designed to have a range of 11 km, an intercept altitude of 40 km, and a speed of Mach 9. According to IAI's Director General Moshe Keret, the new interceptor will be operational in two years. Arrow-2 will have capabilities similar to the ERINT and THAAD ATBM systems when fully operational. Four Arrow-2 flights are planned for 1996, including the first to involve the intercept of a missile target.

Alon Pinkas, *Jerusalem Post* (Jerusalem), 7/31/95; in FBIS-NES-95-146, 7/31/95 **(5254).** *Jane's Defence Weekly*, 8/5/95, p. 4 **(5254).** David Hughes, *Aviation Week and Space Technology*, 8/7/95, p. 59 **(5268).** *Jane's Defence Weekly*, 8/12/95, p. 23 **(5254).** David Eshel, *ASMZ* (Frauenfeld), 7/95-8/95, pp. 47-48; in FBIS-NES-95-173, 9/7/95 **(5254).** *International Defense Review*, 9/95, p.10 **(5254).**

10/23/95

Foreign Minister Shimon Peres declares that no missiles armed with warheads, excluding those of Israel's Defense Forces, will be permitted in the zones to be controlled by the Palestinian Authority.

Israel Television Channel 3 Network (Jerusalem), 10/23/95; in FBIS-NES-95-205, 10/23/95 **(5576).**

10/25/95*

Israel's 4.07 m long Searcher UAV has a maximum speed of 110 kt (200 km/h) and a maximum take-off weight of 318 kg, excluding a 64 kg optical payload which can be carried either internally or externally. The 150 km-range Searcher has a wing span of 7.2 m, and an external SACHS 26 kW (35 hp) engine; IAI is now considering the "more powerful" UEL rotary engine for the Searcher. Searcher missions are typically conducted at altitudes of between 7,000 and 10,000 ft above the target area. Israel's defense forces acquired the Searcher UAV to replace the Scout UAV in 1992.

Arie Egozi, *Flight International*, 10/25/95-10/31/95, p. 27 **(5396).**

ISRAEL WITH:
Brazil, India and PRC, 164
India, 171

ISRAEL WITH PRC

10/4/95*

Israel's TAAS is working on a stand-off cruise missile variant of Delilah for the Chinese Air Force.

Flight International, 10/4/95-10/10/95, p. 28 **(5574)**.

ISRAEL WITH SOUTH KOREA

8/27/95-8/29/95

South Korean Defense Minister Lee Yangho meets with Prime Minister Yitzhak Rabin and Israeli defense industry leaders in Israel to discuss possible procurement of Israeli defense technologies, including missiles and unmanned aerial vehicles (UAVs). According to Gerald Steinberg of the BESA Center for Strategic Studies at Bar-Ilan University, South Korea is also interested in Israeli early warning systems, advanced missile tracking, and ballistic missile defense technologies.

Sharone Parnes, *Defense News*, 9/4/95-9/10/95, p. 10 **(5528)**.

ISRAEL WITH SYRIA

8/95

According to Israeli defense sources, the Arrow ATBM would be Israel's only front-line defense against a Syrian ballistic missile attack, but the system would not be able to engage all the missiles that Damascus can produce.

Channel 2 Television Network (Jerusalem), 8/30/95; in FBIS-NES-95-169, 8/31/95 **(5425).**

ISRAEL WITH THAILAND

8/7/95*

Thailand considers purchasing Israel Aircraft Industries'(IAI) Searcher UAV. Thai officials will visit IAI during the week of 8/7/95 to determine whether it meets procurement requirements. Thai officials are skeptical about the status of Israel's Searcher and will not guarantee its purchase. Bangkok's contract rules require that defense systems procured from abroad must not be prototypes and must be in use with the contracting company's "home military," thereby ensuring the supply of spare parts and support equipment. IAI Vice President for Public Affairs Marvin Klemov asserts that the Searcher is not a prototype and was incorporated into Israel's Defense Forces in 7/92.

Jason Glashow, *Defense News*, 8/7/95, pp. 4, 26 **(5477).**

ISRAEL WITH UNITED STATES

1/94

The Clinton administration makes a policy exception by allowing future imports into the U.S. of rocket technology from Israel's Shavit SLV program.

Risk Report, 6/95, p. 8 **(5500).**

11/94

Israel acquires a Cray J916 computer from the U.S. The purchase ignites concern in some U.S. government agencies that it could be used to design missiles. The U.S. continues to control missile-related exports to Israel because of its failure to sign the NPT, and due to its production of nuclear-capable missiles.

Risk Report, 6/95, p. 9 **(5422).**

Summer 1995

Israeli Prime Minister Yitzhak Rabin and U.S. Secretary of Defense William Perry agree to a five-year program, as part of the Ballistic Missile Defense Organization's (BMDO) theater missile defense initiative, in which the U.S. will spend $33 million a year on Israel's Arrow ATBM project. The U.S. will pay for missile development, while Israel will finance development of the fire control radar, and the fire control, launch control, and battle management centers.

David Hughes, *Aviation Week and Space Technology*, 8/7/95, p. 59 **(5268).**

6/95*

U.S. companies are forbidden to conduct business with several Israeli space projects due to the Clinton administration's policy of not supporting SLV development in non-MTCR countries. According to a U.S. official, the administration would like Israel to join the MTCR, but it will first have to establish a respectable record of MTCR guideline implementation and sign the NPT or a similar regional agreement. Under Supplement 6, Part 778 of the U.S. Commerce Department's Export Administration Regulations (EAR), Israel is considered a country of missile proliferation concern. U.S. companies are required to obtain export licenses if they know their exports will be used in the design, development, manufacture, or use of Israeli missiles or rockets that are capable of carrying a 500 kg payload to ranges of 300 km or more.

Risk Report, 6/95, p. 8 **(5500).**

6/95*

Israel deploys the Popeye air-to-surface stand-off missile, which has a 365 kg warhead, a range of up to 80 km, and an accuracy which can be measured in centimeters. The Popeye was jointly developed and is co-produced by the U.S.'s Martin Marietta and Israel's Rafael. The longer-range and lighter Popeye-2 standoff missile is currently under development.

Risk Report, 6/95, p. 8 **(5498).**

7/25/95

U.S. Under Secretary of Defense for Acquisition and Technology Paul G. Kaminski writes to Congressman Bob Livingston, Chairman of the House Appropriations Committee, to answer questions regarding the future viability of the Arrow program. Kaminski responds to doubts that Arrow will reach the production stage, due to $10 billion development cost projections, by citing both Israel's commitment to the project and a classified cost estimate which predicts that production costs will fall below $10 billion. Kaminski also states that "Israel has capitalized on its test results and has steadily improved the performance of the Arrow interceptor missile."

David Hughes, *Aviation Week and Space Technology*, 8/7/95, p. 59 **(5268).**

Late 7/95

Israeli and U.S. defense officials gather in Israel to prepare for a fly-out test of the Arrow-2 ATBM in early 8/95.

Space News, 7/31/95-8/6/95, p. 2 **(5306).**

8/21/95*

Israel plans to deploy the Barak anti-missile system on board its three U.S.-supplied Sa'ar-5 Corvette-class missile boats by 1997.

Sharone Parnes, *Defense News*, 8/21/95, pp.4, 28 **(5308).**

8/28/95*

Israel plans to upgrade its Shavit-1 SLV into a more advanced booster known as Next. This enhancement will reportedly illustrate Israel's ability to indigenously manufacture long-range missiles. Senior officials from Israel's Ministry of Defense state that exports of space technology with direct military applications will not be authorized.

Sharone Parnes, *Space News*, 8/28/95-9/3/95, p. 18 **(5426).** *Aviation Week and Space Technology*, 8/21/95, p. S6 **(5426).**

10/4/95*

Israel's TAAS will cooperate with the U.S.'s McDonnell-Douglas (MDC) to develop several derivatives of the former's Delilah stand-off decoy UAV. According to one source, the principal goal of this venture will be to manufacture stand-off weapon variants of Delilah. The joint venture reportedly includes work on the anti-radiation, loitering Star-1 version of Delilah. MDC has acquired joint production and marketing rights for Delilah and its derivatives.

Flight International, 10/4/95-10/10/95, p. 28 **(5574).**

10/18/95*

The U.S. Navy considers purchase of the TRW/IAI short-range Hunter UAV. A U.S. Navy flight test of the Hunter, originally scheduled for 10/95, was postponed until early 1996 due to investigations into three Hunter testing accidents, the most recent of which occurred on 8/23/95.

Flight International, 10/18/95-10/24/95, p. 18, **(5497).**

10/19/95

Israel's Channel 2 Television reports that U.S. Director of Central Intelligence John Deutch and Israeli Prime Minister Yitzhak Rabin meet to discuss assessments of Iran's nuclear and SSM capabilities. Television Channel 2 also reports that Deutch is scheduled to visit Arrow missile project facilities on 10/20/95.

Reuter, 10/19/95; in Executive News Service, 10/19/95 **(5572).**

10/30/95*

TRW is awaiting a Clinton administration policy decision which might allow the firm to use Israel's Shavit SLV to launch the U.S. Air Force Tri-Service Experimental satellite.

Space News, 10/30/95-11/05/95, p.2 **(5573).**

ITALY

ITALY WITH:

Brazil, 163
France, 167
France, Germany, and United Kingdom, 166
France, Germany, and United States, 167

ITALY WITH MALAYSIA

8/16/95

Malaysian Defense Minister Datuk Syed Hamid announces that the Royal Malaysian Navy will buy two corvettes from the Italian shipyard Fincantieri. The corvettes are equipped with Aerospatiale MM38 Exocet SSMs.

New Straits Times (Kuala Lumpur), 8/16/95, p. 2; in FBIS-EAS-95-162 **(5664).**

10/26/95

Malaysian government official Abdul Aziz Muhamad signs a contract with Corrado Abntonini, chairman of Italy's Fincantieri Shipyard, for two "fast-missile corvettes" armed with SSMs. According to Malaysian Defense Minister Syed Hamid Albar, the corvettes will arrive in 4/97 and will fulfill coastal defense roles. The two corvettes are part of a shipment originally manufactured for Iraq but were not delivered in 1991 because of the U.N. embargo.

UPI, 10/26/95; in Executive News Service, 10/26/95 **(5320).**

JAPAN

INTERNAL DEVELOPMENTS

8/94

An advisory group to the Japanese Prime Minister asserts that Japan's TMD program should involve cooperation with the U.S.

Mark Hewish, *International Defense Review*, 8/95, pp. 28-34 **(5632).**

Mid-1995

A JDA white paper recommends a shift in the focus of Japan's defense policy from addressing a single Soviet threat to addressing regional threats such as North Korea's ballistic missile capability.

William Dawkins, *Financial Times*, 7/3/95, p. 5 **(5439).**

Mid-1995

The JDA contracts with Nissan and Kawasaki Heavy Industries (KHI) to develop a side thruster controlled interceptor missile. The agreement should help Japan qualify for the Theater Missile Defense (TMD) initiative with the U.S. The side thruster control system expels combustion gas through about 100 openings on the side of the missile, which allows it to make complex maneuvers to alter its flight path. The JDA commits 140 million yen for research and development on the thruster drive technology, and 272.7 million yen on airframe movement controls, to Nissan and KHI respectively. The JDA requests Nissan and KHI to complete a prototype by the end of 1995.

Nikkan Kogyo Shimbun (Tokyo), 6/13/95, p. 17; in FBIS-JST-95-053, 6/13/95 **(5340).**

6/95

The JDA forms a committee to develop a computer-aided acquisition and logistics support system (CALS) to make computerized information on defense equipment, including the Patriot ATBM, available to Japanese defense contractors. CALS is designed to reduce the time needed to develop and produce defense equipment, and to cut costs. The Patriot missile will be the first item entered into CALS, which will be on-line in 1996.

Nihon Keizai Shimbun (Tokyo), 7/28/95, p. 11; in FBIS-EAS-95-154, 7/28/95 **(5257).**

7/95

An official from the Ministry of International Trade and Industry (MITI) says that after two years of debate Japan will soon adopt a catch-all export control clause. Under the clause, exporters will be required to inform the government if they suspect their products are destined for WMD uses. Japan's Center for Information on Security Trade Control (CISTEC) maintains the Chaser open-source database to supply Japanese companies with information on potential buyers. Firms must contact CISTEC themselves to determine whether potential buyers are likely to use their exports for WMD production. MITI also uses public source information from CISTEC to evaluate export license applications.

Risk Report, 7/95-8/95, pp. 1, 9 **(5560).**

8/95

Toru Ishikawa, managing director of Ishikawajima-Harima Heavy Industries Co. Ltd.'s (IHI) Aerospace Division, expresses IHI's interest in participating in missile defense projects. IHI has experience in the field of propulsion systems and composite materials.

Wing (Tokyo), 8/16/95, p. 1; in FBIS-JST-95-058, 8/16/95 **(5339).**

8/14/95

The JDA decides to proceed with the manufacture of a new SAM to replace the Ground Self Defense Force's (GSDF) Hawk missile; cost estimates are 128.4 billion yen over seven years. The new intermediate-range SAM will fulfill TMD requirements and will feature an improved guidance system capable

of tracking numerous targets simultaneously. Mitsubishi Electric Corporation has been conducting research and development on the advanced SAM since FY 1989. The new SAM will reportedly have capabilities that surpass "improved Patriot missiles," and will be capable of intercepting low-flying cruise missiles.

Nikkan Kogyo Shimbun (Tokyo), 8/16/95, p. 7; in FBIS-JST-95-057, 8/16/95 **(5341).** *Yomiuri Shimbun* (Tokyo), 8/15/95, p. 1; in FBIS-EAS-95-159, 8/15/95 **(5341).**

8/23/95

Colonel Takeyuki Sakurai, commander of the Japanese Air Defense Missile Guidance Squadron, stresses the need to acquire a TMD system for defense against East Asian theater missles. Sakurai recommends construction of a "multi-level" defense system including ground- and sea-based assets capable of intercepting missiles at various altitiudes.

Colonel Takeyuki Sakurai, *Wing* (Tokyo), 8/23/95, p. 8; in FBIS-JST-95-061, 8/23/95 **(5447).**

8/30/95

The JDA submits a 14.3 billion yen ($147.4 million) budget request to the Finance Ministry for development of a SAM system to replace the Japanese Army's U.S.-origin Hawk missiles. According to JDA officials, development of the new SAM falls under the jurisdiction of the Technical Research and Development Institute. The new missile is scheduled for completion in 2003 when it will be deployed to five regional armies.

Naoaki Usui, *Defense News*, 9/4/95, pp. 4, 36 **(5476).**

Late 8/95

The JDA releases a report, "On Research Concerning Ballistic Missile Defenses," designed to convince the Japanese public of the need for missile defenses. According to the report, Japan's ability to address the threat posed by ballistic missiles is limited. The report's findings prompt the JDA to call for several studies into relevant technologies and systems including: satellite-linked sensor systems to detect and identify ballistic missiles; a weapon system capable of intercepting ballistic missiles at a " very high altitude and an extremely high relative speed"; and highly integrated command, control and intelligence systems to aid decision-making. According to a JDA spokesman, Japan's Ballistic Missile Defense Study Office hopes to conduct these studies in 1996.

Naoaki Usui, *Defense News*, 9/11/95-9/17/95, p. 14 **(5537).**

8/31/95

The JDA presents a 450 million yen ($4.79 million) budget request to the Finance Ministry for research and development in its TMD program. The program, to be managed by the JDA's Ballistic Missile Research Office, will develop an anti-missile system capable of boost-phase interception. A future Japanese TMD system will probably include a "new launching platform" and an "enhanced early warning system" which may incorporate a network of Japanese-manufactured reconnaissance satellites and computers.

Naoaki Usui, *Defense News*, 8/21/95-8/27/95, p. 8 **(5480).**

8/31/95

Under the JDA's FY 1996 budget proposal, Japan's TMD feasibility study—amounting to 20 million yen in FY 1995—will continue under the auspices of the Mid-Term Defense Buildup Program.

Nikkan Kogyo Shimbun (Tokyo), 8/31/95, p. 16; FBIS-JST-95-065, 8/31/95 **(5478).**

9/19/95

Hirofumi Eguchi, vice-counselor for Technical Development of Japan's Technical Research Development Institute (TRDI), lectures on the "interception of missiles penetrating from high altitudes" at the 1995 Asagumo Technical Seminar in Tokyo. According to Eguchi, TRDI has missile technologies on par with the U.S. and Europe, although it needs to enhance its technology to combat electromagnetic jamming. Eguchi adds that TRDI needs to develop an anti-missile defense system to combat missiles which enter from high altitudes and at great speeds, and cruise missiles which fly at low altitudes.

Asagumo (Tokyo), 9/28/95, p. 8; in FBIS-JST-95-073, 9/28/95 **(5612).**

JAPAN WITH:

Germany and United States, 168

JAPAN WITH SOUTH KOREA

9/22/95

The defense ministers of Japan and South Korea agree to work more closely together on military matters to counter the North Korean nuclear threat.

Washington Times, 9/23/95, p. A9 **(5375)**.

JAPAN WITH UNITED STATES

5/94

The U.S. Department of Defense proposes four TMD options for Japan, ranging in price from $4.4 billion to $16.3 billion. The options would all be deployed by 2004 or 2005 and are designed to address the threat posed by North Korea's Nodong-1 and/or China's CSS-2 and CSS-5. The four options include various combinations of destroyers equipped with Aegis and/or over-the-horizon radar, a Block IV-A version of the Standard missile, PAC-3 Patriot missiles, AWACS, ground-based surveillance radars, and Theater High Altitude Area Defense (THAAD) systems.

Naoaki Usui, *Defense News*, 8/21/95-8/27/95, p. 8 **(5480).**

11/94

Japan's Mitsubishi signs an agreement with the U.S.'s Lockheed Missiles and Space Company to cooperate in the TMD field.

Mark Hewish, *International Defense Review*, 8/95, pp. 28-34 **(5632).**

1/95*

The JDA's Third Research Center in Tachikawa City is conducting joint research with U.S. engineers on "ducted rocket engine (DRE)" propulsion systems. DREs use atmospheric oxygen to burn with the rocket's fuel in flight, rather than using a built-in oxygen supply. The Third Research Center and the U.S. Missile Command Research Center began joint research on rocket propulsion in 1992; testing is scheduled to begin at sites in both countries in FY 1996.

Ryonosuke Kubota, *Explosion* (Tokyo), 1/95, pp. 33-35; FBIS-JST-95-051, 8/3/95 **(5445).** Yoshio Oyumi, *Securitarian* (Tokyo), 6/95, pp. 46-47; in FBIS-JST-95-051, 8/3/95 **(5445).**

Early 7/95

The Japanese Army signs a $55 million contract with Loral Vought Systems of Dallas for nine Multiple Launch Rocket Systems (MLRS). The order includes five assembled systems as well as four MLRS kits to be assembled by Nissan Aerospace, Tokyo; all of the systems are scheduled for delivery by late 1997. According to Loral Vought spokesman Craig Vanbebber, Japan has ordered 36 launchers and will procure MLRS rockets through a U.S. foreign military sales contract.

Defense News, 7/3/95, p. 13 **(5255).**

10/95

MITI drafts a report which recommends Japan's joint development and production of theater missile defenses (TMD) to sustain the defense industry at a time when Japan's defense budget is being reduced. MITI's report may cause Japan to reconsider its arms export policy because of the future possibility of joint U.S.-Japanese defense development and production.

Asahi Shimbun (Tokyo), 10/28/95/ p. 2; in FBIS-EAS-95-209, 10/28/95 **(5390).**

KAZAKHSTAN

KAZAKHSTAN WITH RUSSIA AND UKRAINE

7/31/95*

Kazakhstan, Russia, and Ukraine are seeking to cooperate in joint space ventures. Past disagreements over leasing and licensing, such as the Russian-Kazakhstani dispute over the Baikonur Cosmodrome, have reportedly subsided. According to analysts from the Anser Corp., a technical consulting company, Kazakhstan intends to invest some of its lease money from the Cosmodrome in cooperative space ventures.

James R. Aster, *Aviation Week & Space Technology*, 7/31/95, p. 19. **(5607).**

KUWAIT

KUWAIT WITH:
Egypt, 166
France, 167

KUWAIT WITH RUSSIA

7/29/95*

Proposals reportedly exist for Moscow to "supply Russian SS-200 ground-to-ground missile launchers" to Kuwait.

Jacques de Lestapis, *Jane's Defence Weekly*, 7/29/95, pp.26-32 **(5427).**

KUWAIT WITH UNITED STATES

7/29/95*

Since the Gulf War of 1991, Kuwait has ordered five Patriot firing units with 210 MIM-104 PAC-2GEM missiles from the U.S.; cost of the order is $327 million.

Jacques de Lestapis, *Jane's Defence Weekly*, 7/29/95, pp.26-32 **(5427).**

7/29/95*

The Kuwaiti Navy reportedly considers purchasing the Harpoon Block 1G (B) ASM from the U.S. to fulfill its Offshore Missile Vessel (OMV) SSM/ASM requirement.

Jacques de Lestapis, *Jane's Defence Weekly*, 7/29/95, pp.26-32 **(5427).** E.R. Hooton, *International Defense Review*, 7/95, pp. 73-79 **(5427).**

LIBYA

INTERNAL DEVELOPMENTS

6/95

Libya realigns its security services by transferring all foreign arms procurement from the military intelligence service, headed by Khuaildi Humaidi, to the chief of battalions, Colonel Khalifa Ahneiche. Colonel Said Oueydat al Qadhafi currently commands Libya's missile bases.

Intelligence Newsletter, 7/13/95, p. 5 **(5259).**

LIBYA WITH:
Iran, 173
Iraq, 175

LITHUANIA

LITHUANIA WITH RUSSIA

10/27/95*

Lithuania's Foreign Affairs Ministry expresses concern over Russia's Tochka missile test at the Dobrovolsk training ground in the Nesterov District, Kaliningrad Region. Dobrovolsk is located within 10 km of the border with Lithuania.

Radio Vilnius Network (Vilnius), 10/27/95; in FBIS-TAC-95-006, 10/27/95 **(5633).**

MALAYSIA

INTERNAL DEVELOPMENTS

10/23/95*

Malaysia's Royal Navy intends to purchase 27 offshore patrol boats, but has yet to decide which electronic missile defense protection system it will fit onboard these vessels.

Gregor Ferguson, *Defense News*, 10/23/95, p. 10 **(5559).**

MALAYSIA WITH:
Italy, 178

MALAYSIA WITH UNITED KINGDOM

10/26/95*

The Royal Malaysian Navy is scheduled to receive two missile frigates from the U.K. in late 1996.

UPI, 10/26/95; in Executive News Service, 10/26/95 **(5320).**

MAURITIUS

MAURITIUS WITH:
Chile, 164

MISSILE TECHNOLOGY CONTROL REGIME (MTCR) DEVELOPMENTS

6/8/95

The Clinton administration waives sanctions against Russia and Brazil after Moscow transfers carbon fiber technology to Brazil's commercial SLV project. According to officials, the waiver is the result of Moscow's promise to stop selling such technology and American intentions to have Brazil as a full MTCR member.

Arms Control Today, 7/95-8/95, p. 27 **(5631).**

6/24/95

Pakistani Foreign Minister Sardar Asif Ahmad Ali says U.S. MTCR policy towards Pakistan is discriminatory because sanctions were lifted from China in 1994 but have been maintained against Pakistan. Ali also denies that Pakistan has ever "exceeded the international standard of missile technology... "

The News (Islamabad), 6/25/95, p. 12; in FBIS-TAC-95-004, 6/25/95 **(5409).**

6/30/95

Russian Prime Minister Viktor Chernomyrdin announces that an agreement has been reached with the United States on Russian membership in the MTCR and Russian participation in a successor regime to COCOM. The announcement follows a two-day meeting of the Russian-American Commission on Economic and Technological Coooperation. During the meeting, Chernomyrdin and U.S. Vice President Al Gore resolve U.S. concerns over previous Russian missile technology sales to India and Brazil. Russian President Boris Yeltsin expresses his support for the decisions reached during the negotiations.

Russian Public Television First Channel Network (Moscow); in FBIS-SOV-95-127, 6/30/95 **(5597).** Interfax (Moscow), 6/30/95; in FBIS-SOV-95-127, 6/30/05 **(5597).** Theresa Hitchens, *Defense News*, 7/17/95-7/23/95, p. 12 **(5631).**

7/95*

Pakistan's Ambassador to the U.S. Maleeha Lodhi says U.S. policy discriminates against Pakistan because it restricts missile transfers but does not punish countries indigenously developing missile systems. Ambassador Lodhi states that this failure to address indigenous programs will promote missile proliferation.

Maleeha Lodhi, *Risk Report*, 7/95, p. 10 **(5418).**

7/10/95

South Korean Foreign Minister Kong Nomyong says South Korea will consider joining the MTCR.

Pak Chae-pom, *Seoul Sinmun*, 7/12/95, p. 6; in FBIS-EAS-95-133 **(5343)**. *Tong-a Ilbo* (Seoul), 10/9/95, p. 1; in FBIS-EAS-95-195, 10/9/95 **(5379)**. Kim Tang, *Sisa Journal* (Seoul), 10/12/95, pp. 20-24; in FBIS-EAS-95-196, 10/12/95 **(5373)**. *Hanguk Ilbo* (Seoul), 9/26/95, p. 3; in FBIS-EAS-95-186, 9/26/95 **(5446)**. *Korea Herald* (Seoul), 10/12/95, p. 3; in FBIS-EAS-95-200, 10/12/95 **(5535)**. *Hanguk Ilbo* (Seoul), 10/31/95, p. 2; in FBIS-EAS-95-210, 10/31/95 **(5548)**.

7/12/95

U.S. Undersecretary of State for Arms Control and International Security Affairs Lynn Davis says the U.S. is "satisfied that Russia is meeting its commitments"and that the U.S. "supports Russia's immediate participation and membership in the MTCR." Davis adds that Russia is working on an effective export control system and has addressed U.S. concerns over its transfer of rocket technology to India.

Theresa Hitchens, *Defense News*, 7/17/95-7/23/95, p. 12 **(5631).**

7/24/95

Russian Prime Minister Chernomyrdin signs the "Russian Federal Government Decree on the Russian Federation's Accession to the International Missile Technology Control Regime." The decree allows Russia to adopt MTCR guidelines, formalizes Russia's full membership in the regime, and includes a Foreign Ministry note reserving Russia's right to engage in Category I trading activities with CIS countries. The decree also includes a memorandum noting member requirements to consult with each other before transferring missile-related technologies and to inform "without delay" other signatory governments of decisions to deny Category I export applications.

Aleksandr Krasulin, *Rossiyskaya Gazeta*, 8/18/95, p. 14; in FBIS-TAC-95-016-L, 8/18/95 **(5634).**

8/4/95

Indian Prime Minister Narasimha Rao voices his misgivings towards the MTCR because of its "limited and selective approach."

Ashoke Narain, All India Radio Network (Delhi), 8/5/95; in FBIS-TAC-95-016-L, 8/5/95 **(5304).**

8/12/95*

Russia is expected to take part in the next MTCR meeting in Bonn as a full member in the regime. U.S. sources say Russia may first participate in an informal MTCR meeting at a secret location on 8/30/95.

Defense News, 8/12/95-8/27/95, p. 2 **(5631).**

8/28/95

Officials from the South Korean Ministry of Trade, Industry, and Energy say South Korea is implementing new export control legislation in preparation for its eventual adherence to the MTCR.

Korea Times (Seoul), 8/29/95, p. 8; in FBIS-TAC-95-005, 8/29/95 **(13878)**.

9/21/95

U.S. Assistant Secretary of State Thomas McNamara tells the subcommittee on international affairs of the Senate Committee on Banking, Housing, and Urban Affairs that the U.S. has gained the agreement of Brazil, Russia, and Ukraine to abide by MTCR guidelines. McNamara says the U.S. supports Russia's immediate membership in the MTCR because it has established effective export control policies and systems and has resolved past concerns regarding its record in the missile proliferation field.

Federal News Service, 9/21/95, pp. 1-6 **(5603).**

9/25/95

South Korea's Minister of National Defense says it is willing to join the MTCR before

unilaterally dropping South Korea's MoU with the U.S. restricting its missile development.

Son Ki-yong, *Korea Times* (Seoul), 9/26/95, pp. 1-2; in FBIS-EAS-95-186, 9/26/95 **(5446)**.

10/10/95-10/12/95

In Bonn, Germany, 27 member states attend the MTCR's 10th Plenary session, including Russia and South Africa for the first time. The partners vote unanimously for Brazilian membership and amend the Equipment and Technology Annex "in light of technical development[s]." The MTCR members consider the impact of missile proliferation on regional security and reaffirm their commitment to preventing the proliferation of WMD delivery systems via export controls. The member states also reaffirm their willingness to cooperate in space activities for peaceful purposes and decide to increase dialogue with non-MTCR states to promote "voluntary adherence" to the regime guidelines. The meeting is chaired by Adolf von Wagner, deputy director general in the German Foreign Office.

Press Release, Bureau of Political-Military Affairs, U.S. Department of State, 10/12/95 **(5666).** *Space News*, 10/30/95, pp. 1, 20 **(5580).**

10/14/95

The South African Foreign Ministry announces that South Africa's membership in the MTCR was approved on 10/13/95. The Foreign Ministry says that South Africa's inclusion in the MTCR will open new opportunities for its defense industry and will bolster the country's commitment to the nonproliferation of WMD.

SAPA (Johannesburg), 9/14/95; in FBIS-TAC-95-005, 9/14/95 **(5442).**

10/25/95

Brazilian Foreign Minister Luiz Felipe Lampreia says that MTCR membership gives legitimacy to Brazil's space launch program.

Space News, 10/30/95-11/5/95, pp. 1, 20 **(5580).**

NETHERLANDS

NEW FORUM

INTERNAL DEVELOPMENTS

9/95

The U.S., Russia, and 26 other countries agree to create the "New Forum" organization in an attempt to prevent the spread of destabilizing weapons, and to deal with rogue proliferant states such as Iran, Iraq, Libya, and North Korea. Among other items, the regime's partners plan to share intelligence and information on the trade in arms and dual-use goods. The partners plan to establish the New Forum by the end of 1995.

Aviation Week and Space Technology, 9/25/95, p. 27 **(5261).**

NEW FORUM WITH SOUTH KOREA

8/28/95

Officials from the South Korean Ministry of Trade, Industry, and Energy say South Korea plans to join the New Forum.

Korea Times (Seoul), 8/29/95, p. 8; in FBIS-TAC-95-005, 8/29/95 **(5653)**.

NORTH ATLANTIC TREATY ORGANIZATION (NATO)

NORTH KOREA

INTERNAL DEVELOPMENTS

7/8/95*

In the past year, North Korea has deployed around 70 240 mm MLRS—each having a range of about 70 km—within range of Seoul.

Hwang Yu-song, *Tong-a Ilbo* (Seoul), 7/8/95, p. 6; in FBIS-EAS-95-131, 7/8/95 **(5287)**.

7/8/95*

North Korea plans to begin mass production of its 1,000 km-range No-dong-1 SSM. North Korea has been conducting tests of its 2,000 to 6,000 km-range Taepo-dong-1 and -2 SSMs, and plans to finish development by 2000.

Hwang Yu-song, *Tong-a Ilbo* (Seoul), 7/8/95, p. 6; in FBIS-EAS-95-131, 7/8/95 **(5287)**.

8/95

According to Israeli sources, North Korea has halted development of the No-dong SSM, either due to technical difficulties or to intense pressure from the U.S. North Korea began its No-dong missile program in the mid-1980s and conducted its first test firing in 5/93.

Flight International, 8/30/95-9/5/95, p. 4 **(5272)**.

9/10/95

A South Korean intelligence official cites Russian intelligence indicating North Ko-

rea could deploy the Taepo-dong-2 ICBM by the year 2000. According to U.S. Defense Intelligence Agency computer simulations, the Taepo-dong-2 might have a range between 4,300 and 6,000 km. According to Russian sources, however, North Korea could extend the range of the Taepo-dong-2 to beyond 9,600 km once difficulties with the inertial navigation system, warhead weight, and fuel injection are resolved. The Taepo-dong-2 reportedly has two stages, using a 16.2 m booster with a 16 m Taepo-dong-1 to carry a 1,000 kg warhead. North Korea recently tested the missile's engine at its Sanumtong test site, where it is conducting research and development of the Taepo-dong-1 and Taepo-dong-2.

Pak Chae-pom, *Seoul Sinmun*, 9/11/95, p. 3; in FBIS-EAS-95-175, 9/11/95 **(5273)**.

9/12/95*

According to Yonhap news agency, North Korea finished development of its No-dong-1 IRBM by 1994; Pyongyang is now moving to deploy the system. By 12/95, North Korea will complete development of the more powerful No-dong-2 IRBM. By 12/96, North Korea will be capable of mass-producing its Taepo-dong-1 missile. Finally, by 2000, the Taepo-dong-2 missile will be operational.

Kyodo (Tokyo), 9/12/95; in FBIS-EAS-95-177, 9/12/95 **(5285)**.

9/15/95*

Referring to reports that North Korea has already deployed its No-dong-1 missile, the chairman of Japan's Joint Staff Council (JCS) of the Self-Defense Forces, General Tetsuya Nishimoto, says, "Perhaps the possibility of North Korea deploying these missiles is low."

Nihon Keizai Shimbun (Tokyo), 9/15/95, p. 8; in FBIS-EAS-95-181, 9/15/95 **(5288)**.

9/29/95*

By the year 2000, North Korea could extend its Taepo-dong-2 ICBM range to target the western U.S. using nuclear, chemical, or biological payloads. U.S. analysts say the Taepo-dong-2 is so inaccurate that its only purpose could be to carry weapons of mass destruction. Some U.S. intelligence officials describe North Korean missiles as being Scuds with simple guidance and control systems.

Bill Gertz, *Washington Times*, 9/29/95, p. A3 **(5527)**.

10/95*

Citing unverified reports, the International Institute of Strategic Studies' 1995-1996 *Military Balance* says North Korea has approximately six operational No-dong-1 missile launchers. The No-dong-1 is said to have a circular error probable (CEP) of between 2,000 and 4,000 m.

International Institute of Strategic Studies, *Military Balance 1995-1995*, 10/95, pp. 281-285 **(5569)**.

10/2/95

South Korea's Defense White Paper notes that North Korea can manufacture 100 Scud missiles per year and that the North is proceeding with Taepo-dong-1 and Taepo-dong-2 development.

Korea Herald (Seoul), 10/3/95, p. 3; in FBIS-EAS-95-194, 10/3/95 **(5371)**.

10/4/95

South Korean Chief of Naval Operations Admiral An Pyong-tae says North Korea has completed a new 180 km-range "ground-to-sea missile." North Korea has tested the missile successfully on several occasions. The development of this missile expands North Korea's capacity for surprise attacks and long-range strikes.

Sin Hyo-sop and Yu Song-sik, *Hanguk Ilbo* (Seoul), 10/5/95, p. 2; in FBIS-EAS-95-194, 10/5/95 **(5377)**.

10/9/95

A top South Korean National Defense Ministry source says North Korea will be ready to deploy No-dong-1 missiles by 1996, adding that the North can consecutively fire 11,000 "missiles" in one hour without moving its "guns," which could destroy 30 percent of Seoul. The official also notes that North Korea would rely on long-range missiles to strike densely inhabited regions during a war.

Son Tae-kyu, *Hanguk Ilbo* (Seoul), 10/10/95, p. 1; in FBIS-EAS-95-195, 10/10/95 **(5372)**.

10/13/95

In an interview on South Korean television, Choe Chu-hwal, a former colonel who defected from the DPRK, says North Korea is manufacturing 1,000 km-range missiles at the Taeji Plant in Pyongyang. Asked whether the No-dong-1, No-dong-2, and Taepo-dong were still being developed or being deployed, Choe says the DPRK has SSMs with ranges of 400 to 500 km and that a 1,000 km missile has been tested. Choe also believes that North Korea has also placed "tactical missiles with ranges of 300 km, 500 km or 600 km" on the border with South Korea. According to Choe, if North Korea develops strategic missiles with a range of more than 1,000 km, it would not deploy them on the South Korean border.

KBS-1 Television Network (Seoul), 10/13/95; in FBIS-EAS-95-199, 10/13/95 **(5539)**.

10/15/95*

A new U.S. intelligence study asserts that North Korea will soon have the capability to produce blast fragmentation missiles with warheads capable of carrying approximately 100 five kg submunitions each. The submunitions, loaded with metal fragments or chemical weapons, would be dispersed 60 km over the launch area. All 100 submunitions would follow a ballistic trajectory, hitting the target within a time span of 20 seconds.

Re'uven Pedatzur, *Ha'aretz* (Tel Aviv), 10/15/95, p. B1; in FBIS-NES-95-199, 10/15/95 **(5472)**. *Aviation Week & Space Technology*, 7/24/95, p. 19 **(5278)**.

NORTH KOREA WITH:
Iran, 173
Iran and South Korea, 173

NORTH KOREA WITH PRC

9/12/95*

According to Yonhap news agency, China's Ministry of Aeronautics and Astronautics Industry and the Chinese State Commission of Science, Technology, and Industry for National Defense have trained 50 to 200 North Korean missile engineers. Chinese defense and technology companies are said to have also provided technical support to North Korea.

Kyodo (Tokyo), 9/12/95; in FBIS-EAS-95-177, 9/12/95 **(5285)**.

9/25/95

Deputy Minister of the DPRK Hydro-Meteorological Service Kim Ho-il and Deputy

Administrator of the China Meteorological Administration Ma Henian sign a pact on scientific and technical cooperation between the two agencies.

KCNA (Pyongyang), 9/25/95; in FBIS-EAS-95-186, 9/25/95 **(5274)**.

9/29/95*

U.S. intelligence officials say Beijing is assisting Pyongyang with a long-range missile project and training up to 200 North Korean missile engineers in China.

Bill Gertz, *Washington Times*, 9/29/95, p. A3 **(5527)**.

North Korea with Russia

10/30/95*

Russia has exported stealth technology to China and North Korea which would enable these two nations to develop cruise missiles with small radar cross-sections.

David A. Fulgham, *Aviation Week & Space Technology*, 10/30/95, p. 53 **(5438)**.

North Korea with South Korea

9/29/95

ROK Air Force Chief of Staff General Kim Hong-nae tells the National Assembly Defense Committee that 600 North Korean Frog and Scud missiles pointed at South Korea constitute a grave military threat to South Korea. The Frog missiles could hit targets as far south as Anyang, and the range of the Scud missiles includes all of South Korea. Both missiles could be fitted with either chemical or nuclear warheads. According to General Kim, the ROK Air Force is working on several counter-measures to this threat, including pre-emptive strikes against North Korean tactical ballistic missiles, as well as command posts and communications facilities. North Korea has recently deployed more SSM sites, prompting the ROK to plan for the introduction of next-generation SSMs to increase preparedness for a timely counter-attack.

Yonhap (Seoul), 9/29/95; in FBIS-EAS-95-189, 9/29/95 (**5276)**. Kim Ju-Yeon, *Washington Times*, 9/30/95, p. A6 **(5473)**.

North Korea with United States

9/18/95

The U.S. House of Representatives passes a non-binding resolution seeking to ensure North Korean adherence to its nuclear agreement with the U.S. and to set criteria for improving diplomatic relations between the two countries. The resolution advises President Clinton not to improve diplomatic relations or lift trade and investment restrictions unless North Korea meets certain conditions, including a cessation of both missile exports and development of IRBMs.

Reuter (Washington), 9/18/95; in Executive News Service, 9/18/95 **(5275)**.

NORWAY

Norway with Russia, Ukraine, and United States

9/95

The General Director of Ukraine's National Space Agency Aleksandr Negoda says his country would like the joint U.S., Russian, Norwegian, and Ukrainian Sea Launch project to be implemented as soon as possible. The project, led by the U.S.'s Boeing Commercial Space Company, plans to launch satellites using Ukrainian Zenit rockets and Russian upper-stages from a sea-based, semi-submersible oil platform converted by Norway's Kvaerner. The international joint venture—created by Boeing, Ukraine's NPO Yuzhnoye, Russia's Energia, and Kvaerner—is scheduled to start launching commerical payloads from an equatorial location in 1998. According to officials from the U.S.-led international Sea Launch project, the venture will utilize Russian know-how for launch preparation, support, tracking, and telemetry.

Peter B. de Selding, *Space News*, 10/9/95-10/15/95, p. 10 **(5505).** *Kommersant-Daily* (Moscow), 9/8/95, p. 9; in FBIS-SOV-95-175, 9/8/95 **(5505).**

9/95

Kvaerner and another Norwegian firm are awarded $171 million to begin converting a semi-submersible oilrig into a mobile space launch site for the international Sea Launch project.

Flight International, 9/13/95-9/19/95, p. 5 **(5505).**

OMAN

Internal Developments

9/30/95*

Oman asks several UAV manufacturers for information in a bid to enhance its target acquisition and reconnaissance capabilities.

Jacques de Lestapis, *Jane's Defence Weekly*, 9/30/95, pp. 34-36 **(5394).**

9/30/95*

Oman's Qahir class ship, the Al Amwaj, is equipped with eight MM 40 Exocet ASMs. The Qahir class Al Mua'zzer was scheduled for launch on 9/26/95.

Jacques de Lestapis, *Jane's Defence Weekly*, 9/30/95, pp. 34-36 **(5394).**

PAKISTAN

Internal Developments

7/4/95

Pakistani Prime Minister Benazir Bhutto chairs a meeting of the Defence Committee of the Cabinet which considers, among other items, India's deployment of Prithvi missiles in proximity to Pakistan's border. Pakistani leaders reportedly view India's establishment of a "Missile Group" as an attempt to intensify the regional missile race.

News (Islamabad), 7/5/95, pp. 1,4; in FBIS-NES-95-129, 7/5/95 **(5336).**

9/3/95*

Pakistan is reportedly developing an indigenous missile program to acquire an effective deterrent because Harpoon ASMs are no longer available from the U.S. Pakistan already maintains Harpoon Sub-SSMs on its submarine and long-range Exocet ASMs on its Sea King helicopters.

The Muslim (Islamabad), 9/3/95, pp. 1,4; in FBIS-NES-95-176, 9/3/95 **(5401).**

9/5/95*

Major General Mehmud Al Durrani, Pakistan Ordnance Factories (POF) chairman, says the POF is capable of producing missiles, if requested to do so by the Paksitani government. The POF has "several firing ranges from 100 to 200 meter ranges to 40 km open ranges" with "ballistic monitoring" equipment for weapons testing.

Sikander Hayat, *Business Recorder* (Karachi), 9/5/95, pp. 1, 10; in FBIS-NES-95-177, 9/5/95 **(5411).**

10/95

Pakistani Foreign Minister Sardar Asif Ahmad Ali tells reporters in Washington that Pakistan will indigenously develop defenses to counter India's Prithvi and other missiles. Ahmad Ali also says that Pakistan will "match" India's capabilities but will do so without violating the MTCR.

PTV Television Network (Islamabad), 10/4/95; in FBIS-NES-95-192, 10/4/95 **(5402).**

10/9/95

Pakistan's Senate Standing Committee on Defence meets to discuss the national security implications of missile and nuclear weapon proliferation in the region. Senator Chaudhry Shujaat Hussain chairs the meeting, which is also attended by former Chairman of the Joint Chiefs of Staff Ahmad Sarohi, former Foreign Ministers Agha Shahi and Abdul Sattar, former Vice Chief of the Army Staff General K.M. Arif, and other former defense and intelligence officials. The committee concludes that a nuclear deterrent is imperative to Pakistan's security.

Shakil Shaikh, *News* (Islamabad), 10/10/95, p. 1; in FBIS-NES-95-195, 10/10/95 **(5325).**

PAKISTAN WITH:

Afghanistan, 160
India and United States, 172
MTCR, 181

PAKISTAN WITH PRC

7/3/95

U.S. intelligence officials says that by 11/92, China had exported over 30 complete M-11 MRBM to Pakistan; this view is contrary to earlier reports that only missile components had been sent. The officials say storage crates at Pakistan's Sargodha air force base west of Lahore contain the M-11 missiles. Since obtaining the M-11s, Pakistan has built storage sheds, mobile launchers, and related maintenance facilities and housing. With the aid of Chinese experts, Pakistan has also been conducting practice launches.

R. Jeffrey Smith and David B. Ottaway, *Washington Post*, 7/3/95, p. 1 **(5282)**. *Risk Report*, 10/95, pp. 3-8 **(5543)**.

8/28/95*

Pakistani Defense Minister Aftab Shahban Mirani has reportedly said Pakistan is developing an anti-ballistic missile system to intercept the Indian Prithvi SSM.

Aabha Dixit, *Defense News*, 8/25/95, p. 15 **(5365)**.

PAKISTAN WITH PRC AND UNITED STATES

3/95

Robert Einhorn, a Clinton administration official, says the U.S. may have no choice but to impose Category I sanctions on China if enough evidence is gathered to prove that it sold M-11 missiles to Pakistan.

Pushpindar Singh, *Asian Defence Journal*, 5/95, p. 83 **(5544)**.

10/95*

According to a new U.S. law, Washington can wait up to six months to impose sanctions on China for suspected exports of M-11 missiles to Pakistan. The U.S. can impose trade sanctions for two years on China for either conspiring or actually transferring the M-11 to Pakistan.

Risk Report, 10/95, pp. 3-8 **(5543)**. C. Raja Mohan, *Hindu* (Madras), 10/30/95, p. 13; in FBIS-NES-95-212, 10/30/95 **(5543)**.

PAKISTAN WITH SOUTH AFRICA

9/3/95*

Pakistan's Navy prepares to initiate a modernization program which will include the acquisition of a "modern fire control system" for its missile boats and frigates. According to "well informed sources," Pakistan is negotiating with South Africa for the renovation of the fire control systems onboard its naval frigates.

Muslim (Islamabad), 9/3/95, pp. 1,4; in FBIS-NES-95-176, 9/3/95 **(5401).**

PAKISTAN WITH UNITED STATES

6/24/95

Pakistani President Farooq Ahmad Leghari says he has presented several suggestions to the United States to help reduce tensions on the Subcontinent including the establishment of a "zero missile zone."

PTV Television Network (Islamabad), 6/24/95; in FBIS-TAC-95-014-L, 6/24/95 **(5335).**

7/8/95*

The U.S. plans to sell 28 Harpoon ASMs to Pakistan as part of a $370 million arms package.

Nuclear Proliferation News, 7/8/95, p. 10 **(5406).**

7/22/95

An editorial in Pakistan's *Frontier Post* reports that U.S. Senator Larry Pressler has circulated a letter in the Senate asking for assistance in blocking the U.S. transfer to Pakistan of missiles, three Orion P3C antisubmarine planes, and F-16 parts. Pressler voices concern that such a transfer, along with Pakistan's efforts to develop an indigenous long-range ballistic missile with Chinese assistance, could trigger an arms race between India and Pakistan.

Frontier Post (Peshawar), 7/22/95, p. 6; in FBIS-NES-95-142, 7/22/95 **(5491).**

7/25/95*

The Clinton administration is expected to introduce legislation in 7/95 that will allow the U.S. to sell $368 million worth of military equipment to Pakistan. The arms package includes P-3C maritime reconnaissance aircraft, which can be fitted with Harpoon ASMs; the Orion can fire its Harpoon missiles from a range of 120 km before being detected on an enemy's radar. Before the Pressler amendment came into effect, Pakistan received 30 Harpoon missiles from the U.S. and installed them on-board its Gearing-class destroyers and Agosta-class submarines. Pakistan's "Atlantic" naval patrol aircraft are armed with Exocet ASMs.

Times of India (Bombay), 7/25/95, p. 13; in FBIS-NES-95-145, 7/25/95 **(5334).** Sunil Dasgupta, *India Today*, 9/30/95 **(5419).**

Early 8/95

The U.S. Senate prepares to vote on the White House proposal to transfer approximately $400 million worth of weapons to Pakistan, including 28 Harpoon SSMs and three P-3C anti-submarine aircraft.

Vivek Raghuvanshi, *Defense News*, 8/7/95-8/13/95, p. 12 **(5329).**

9/28/95

The U.S. Senate votes to lift military sanctions imposed on Pakistan in 1990. The sanctions withdrawal could allow the U.S. to transfer Harpoon SSMs, Sidewinder AAMs, and F-16 components and upgrade equipment to Pakistan as part of a $368 million weapons package. It is not clear whether the bill will be enacted, however, due to U.S. intelligence reports that Pakistan received nuclear-capable M-11 missiles from China in violation of the MTCR. U.S. Senator John Glenn attacks the measure by saying that rewarding Pakistan with new missiles, economic assistance, and spare parts, "makes a mockery of our non-proliferation efforts."

Elaine Sciolino, *New York Times*, 9/22/95, p. A3 **(5323).**

10/24/95

A U.S. Congressional panel conditionally approves the sale to Pakistan of Harpoon SSMs, Orion P-3C anti-submarine aircraft, radar equipment, and other defense items. The House of Representatives-Senate conference committee approves the $368 million weapons transfer plan by permitting a "one-time waiver" of a law which prohibits U.S. arms sales to Pakistan. The proposed waiver will need to be ratified by the House of Representatives and the Senate before it is submitted to President Clinton for approval. Pakistan purchased these defense items in 1990 but was not allowed to receive them due to U.S. concerns over Pakistan's nuclear weapon program.

Reuter, 10/24/95; in Executive News Service, 10/24/95 **(5333).** Jackie Frank, Reuter, 10/25/95; in Executive News Service, 10/25/95 **(5421).**

PEOPLE'S REPUBLIC OF CHINA (PRC)

INTERNAL DEVELOPMENTS

5/95*

According to senior U.S. officials, China is seeking advanced military technologies, favoring purchases which will allow indigenous production over off-the-shelf buys. China's highest priority is technologies to improve the accuracy, stealth, fuel efficiency, and miniaturization of rocket systems. China has only a "limited capability" in the areas of navigation, guidance and vehicle control, gravity gradiometers, carbon-carbon composites, and polymeric materials, according to the U.S. Defense Department's "Military [Militarily] Critical Technologies List."

Risk Report, 5/95, p. 11 **(5456)**.

5/95*

China has recently deployed its Russian-made SA-10 SAMs.

Security Affairs, 5/95-7/95, pp. 1, 6-7 **(5468)**.

5/17/95*

After the decommissioning earlier in 1995 of the last Chinese escort armed with guns, all Chinese Navy escort ships are now equipped with "sealed" guided missiles.

Zhongguo Tongxun She (Hong Kong), 5/17/95; in FBIS-CHI-95-149, 5/17/95 **(5289)**.

7/3/95

Following the 1/26/95 boost-phase explosion of its Long March-2E, China Great Wall Industry Corporation will strengthen the 39 foot fairing on the 164 foot, two-stage SLV. Work on the fairing will take place before further launches in fall 1995. Meanwhile, the aerospace company has not been successful in its testing of an expendable perigee kick motor. Despite these setbacks, China plans further launches during 1995, including the launch of an Intelsat telecommunications satellite aboard its LM-3B SLV in 11/95. This launch will be one of three Intelsat launches planned through 1997.

Michael Mecham, *Aviation Week & Space Technology*, 7/3/95, p. 22 **(5281)**. *Space News*, 8/7/95-8/13/95, p. 22 **(5281)**.

7/11/95*

According to Chinese military theoretician Song Zhong-yu, China's strategic nuclear weapons may not be capable of overcoming future ballistic missile defense systems, a deficiency which has negative ramifications for the weapon's deterrent value.

Viktor Stefashin, *Krasnaya Zvezda* (Moscow), 7/11/95, p. 3; in FBIS-SOV-95-133, 7/11/95 **(5279)**.

7/11/95*

Reflecting a shift in Chinese military strategy towards preparation for "local wars," Chinese strategists are contemplating the use of non-nuclear strategic missiles. China's deterrent posture may, therefore, rest on the use of non-nuclear-tipped missiles against non-nuclear-weapon states, coupled with a warning of potential escalation to nuclear attack.

Viktor Stefashin, *Krasnaya Zvezda* (Moscow), 7/11/95, p. 3; in FBIS-SOV-95-133, 7/11/95 **(5279)**.

7/18/95

China announces plans to conduct SSM tests from 7/21/95 to 7/28/95. The tests by the People's Liberation Army (PLA) will take place in the East China Sea. The target area will comprise a 10 nm radius sea zone, 60 km north of Taiwan's Pengchia Yu Islet and 130 km from Keelung. China plans to fire six MRBM and LRBM from two sites in the northwest province of Xinjiang.

UPI (Beijing), 7/18/95; in Executive News Service, 7/19/95 **(5299)**. *Aviation Week & Space Technology*, 7/24/95, p. 19 **(5299)**. *Jane's Defence Weekly*, 7/29/95, p. 12 **(5299)**.

7/21/95

"Recent" missile tests conducted by China represent the "highest form" of missile training, according to a Chinese missile training document. The document says the tests had two essential purposes: to send a political message and to assess the combat readiness and nuclear operational capability of China's strategic and tactical forces.

Ming Pao (Hong Kong), 7/21/95, p. A1; in FBIS-CHI-95-143, 7/21/95 **(5290)**.

7/21/95-7/26/95

China conducts SSM tests as part of the ongoing 6/95 to 9/95 Blue Whale Five military exercise. The PLA's 815th M-class missile regiment launches six SRBM and MRBM from its Leping military base in southeastern Jiangxi Province as part of the tests. One of the four M-9s fired misses its target, while the other three achieve a CEP of within two miles after traveling 370 miles. On 7/23, China launches two solid-fuel DF-21 IRBMs from its bases in Tunghua and Chilin to a target area north of Taiwan.

Vivek Raghuvanshi, *Defense News*, 7/31/95-8/6/95, p. 38 **(5302)**. Seth Faison, *New York Times*, 7/24/95, p. 14 **(5359)**. David A. Fulghum and Michael Mecham, *Aviation Week & Space Technology*, 7/31/95, p. 23 **(5359)**. China Broadcasting Corporation News Network (Taipei), 7/24/95; in FBIS-CHI-95-143, 7/24/95 **(5359)**. Bill Gertz, *Washington Times*, 8/15/95, pp. A1, A6 **(5291)**.

7/26/95*

The Central Military Commission (CMC) of China's 2nd Artillery is intensifying efforts to train its personnel on guided missile technology.

Jiefangjun Bao (Beijing), 7/26/95, p. 1; in FBIS-CHI-95-183, 7/26/95 **(5295)**.

Late 7/95

The PLA makes staffing changes in its three general departments. Retiring personnel include General Dai Xuejiang (65), Political Commissar of the State Commission of Science, Technology, and Industry for National Defense (COSTIND), who is replaced by Lieutenant General Li Jinai, the former deputy political commissar.

Chang Hsiu-fen, *Kuang Chiao Ching* (Hong Kong), 9/16/95, pp. 16-18; in FBIS-CHI-95-198, 9/16/95 **(5296)**.

8/95

Two Chinese missile scientists, Liu Er-xun and Huang Zu-wei, write that proposed U.S. Theater Missile Defense (TMD) systems, including THAAD, could undermine the ABM Treaty, potentially weakening Chinese, British and French deterrence. TMD presents a potential danger to strategic stability, they say, because China and other countries may be forced to increase their nuclear arsenal, conduct nuclear tests to improve their warheads, and develop offensive penetration aids and tactics to counter new missile defenses.

Liu Er-xun and Huang Zu-wei, "TMD And The ABM Treaty," (forthcoming paper), 8/95 **(5303)**. *Nuclear Proliferation News*, 6/15/95, pp. 16-17 **(5658)**.

8/10/95

China announces plans to conduct a second series of missile tests from 8/15/95 to 8/25/95 in the East China Sea, 150 km north of Taiwan, as part of a larger military exercise. The exercise will include both missile and artillery tests.

Benjamin Kang Lim, Reuter (Beijing), 8/10/95; in Executive News Service, 8/10/95 **(5300)**.

8/11/95*

At the end of 1994, China's strategic missile forces conducted a nuclear battlefield survival exercise in an "underground palace" in the mountains.

Zhang Jiajun, *Hsien-tai Chun-Shih* (ConMilit) (Hong Kong), 8/11/95/95, pp. 25-27; in FBIS-CHI-95-194, 8/11/95 **(5357)**.

8/15/95-8/23/95

Taiwanese military sources say the Guangzhou Military Region ran a Navy Air Force exercise in coordination with missile tests in the East China Sea. During the third day of the East China Sea exercises, Thunderbolt (Pili) AAM, Sea Eagle (Hai Ying) ASM, and ship-to-air missiles were fired. According to Chinese military officials, China's military regions have recently conducted exercises—including a joint exercise between the Lanzhou Military Region and the Second Artillery Corps—where SSM, SAM and surface-to-ship missiles were fired. The officials say missile tests off of Taiwan are practice for the actual launch of tactical nuclear weapons during conflict at sea.

Ma Tien-lung, *Ping Kuo Jih Pao* (Hong Kong), 8/18/95, p. 1; in FBIS-CHI-95-163, 8/18/95 **(5358)**. *Jane's Defence Weekly*, 8/26/95, p. 14 **(5301)**.

8/18/95*

China's 2nd Artillery Commission of Science and Technology approves a strategic missile simulation training system for use in the PLA's missile units.

Dong Jushan, *Jiefangjun Bao* (Beijing), 8/18/95, p. 1; in FBIS-CHI-95-164, 8/18/95 **(5292)**.

8/25/95*

Military sources say China's current missile-making expertise matches that acheived by France a decade ago. China is expected to produce MIRV technology in the near future, along with the miniaturized warheads for use on MIRVed missiles. The increasingly smaller yields of China's nuclear testing are said to support this hypothesis.

Francis Deron, *Le Monde* (Paris), 8/25/95, p. 2; in FBIS-TAC-95-005, 8/25/95 **(5362)**.

8/29/95*

China's M-series missiles have an estimated circular error probable (CEP) of 300 m.

Lu Te-Yung, *Lien Ho Pao* (Hong Kong), 7/30/95, p. 8; in FBIS-CHI-95-167, 8/29/95 **(5280)**.

9/12/95*

China has indigenously developed computer software to design and enhance laser, infrared, and optical systems which have applications in infrared guidance systems, fighter aircraft head-up displays, and photo reconnaissance satellites. China is distributing the software, named COSA-GOLD, to Chinese aeronautical, space, shipping, and electronics industries.

Fan Jian, *Keji Ribao* (Beijing), 9/12/95, p. 1; in FBIS-CST-95-014, 9/12/95 **(5458)**.

9/19/95*

COSTIND's Communications Department establishes a multi-layer communications network, consisting of fixed ground stations, mobile stations, and ship-based stations. The network is intended to facilitate satellite communications. It will coordinate testing sites, launching sites, "measuring-controlling" stations, and ship-based measuring stations, thereby aiding various types of scientific research, including missile testing.

Jiejangjun Bao (Beijing), 9/19/95, p. 1; in FBIS-CHI-95-211, 9/19/95 **(5555)**.

10/95

Chinese President Jiang Zemin observes a PLA naval exercise that "includes new guided-missile destroyers, guided-missile escorts, nuclear and conventional submarines, guided-missile patrol boats, and various types of aircraft." Ships and aircraft participating in the exercise fire missiles, torpedoes, and cannons.

Xinhua (Beijing), 10/18/95; in FBIS-CHI-95-202, 10/18/95 **(5557)**.

10/11/95

During a Senate Foreign Relations Committee hearing, defense analyst Richard D. Fisher offers testimony on China's missile programs. Fisher says China may attempt to produce cruise missiles similar to Russia's Kh-55 (Kent), with a range of 1,800 miles and a CEP of 500 feet; the Kh-55 is similar to the U.S. Tomahawk. China will probably employ advanced guidance systems to achieve high accuracy, which could be used on its other missiles. To enhance this capability, China is reportedly developing an indigenous position-location satellite system, with future plans for a 10-satellite constellation employing image and infrared sensors. China is arming its frigates with advanced C-801/2 SSMs and PL-10 (HQ-61) SAMs, replacing the older liquid-fueled Silkworm SSMs. Fisher says China is using Russian technology acquired from its 1993-1994 buy of Russian S-300 Grumble SAMs, to build anti-missile systems. According to Fisher, China may use the knowledge gained from anti-missile systems to create countermeasures.

Federal News Service, 10/11/95 **(5655)**.

10/15/95

A Chinese Communist Party representative says the nuclear submarine corps has successfully completed underwater missile testing during recent blue water naval exercises in the Pacific.

Jane Macartney, Reuter (Beijing), 10/15/95; in Executive News Service, 10/16/95 **(5467)**.

10/15/95*

A new U.S. intelligence study asserts that China will soon have the capability to produce blast fragmentation missiles with warheads capable of carrying approximately 100 five kg submunitions each. The submunitions, loaded with metal fragments or chemical weapons, would be dispersed 60 km over the launch area. All 100 submunitions would follow a ballistic trajectory, hitting the target within a time span of 20 seconds.

Re'uven Pedatzur, *Ha'aretz* (Tel Aviv), 10/15/95, p. B1; in FBIS-NES-95-199, 10/15/95 **(5472)**. *Aviation Week & Space Technology*, 7/24/95, p. 19 **(5278).**

10/21/95*

ROK military sources say China's military budget is estimated to be $11 billion and its major acquisitions will include "missile carriers."

Jane's Defence Weekly, 10/21/95, p. 18 **(5547)**.

PRC WITH RUSSIA

7/11/95*

According to a 9/94 article, Russia's Central Scientific Research Institute of Machine Building and Metal Working, the Scientific Research Institute of Thermal Processes, the Samara Central Special Design Bureau, Energia, and Energomash-Tekhnomash enterprises are all exporting technology to China. These exports are reportedly the result of a highly competitive space launch market, which is forcing Russian firms to export technology acquired when Russia was a "leading space power."

G. Lomanov, *Inzhener* (Moscow), 9/94, pp. 18-20; in FBIS-UST-95-027, 7/11/95 **(5503)**.

8/29/95*

According to Western intelligence sources, a Russian cruise missile research and development team is in China to provide expertise and to produce Russian-designed cruise missiles. According to an [unnamed] scholar in Taiwan, in 1993 China imported a Russian cruise missile production facility to a site near Shanghai. China may also improve its C-802 anti-ship cruise missile, using U.S. Harpoon cruise missile technology to create a land-attack version. Taiwanese military sources say China may conduct cruise missile tests in the ocean area north of Taiwan's Pengchia Islet.

Lu Te-Yung, *Lien Ho Pao* (Hong Kong), 7/30/95, p. 8; in FBIS-CHI-95-167, 8/29/95 **(5280)**.

10/30/95*

Russia has exported stealth technology to China and North Korea which would enable these two nations to develop cruise missiles with small radar cross-sections.

David A. Fulgham, *Aviation Week & Space Technology*, 10/30/95, p. 53 **(5438)**.

PRC WITH TAIWAN

10/5/95

Taiwan begins a large-scale military exercise in the Tsoying military zone near the southern city of Kaohsiung. The Hua Hsing exercise, involving 60 frigates and 60 aircraft, is being held in response to China's 7/95 and 8/95 missile tests.

Kyodo (Tokyo), 10/5/95; in FBIS-CHI-95-193, 10/5/95 **(5516)**. Benjamin Yeh, CNA (Taipei), 10/13/95; in FBIS-CHI-95-198, 10/13/95 **(5525)**.

PRC WITH UNITED STATES

1/95*

The U.S. Commerce Department singles out two Chinese research organizations for inclusion on a list of "suspect" entities which will require a license to purchase sensitive U.S. imports. The two organizations, Fudan University and the Shanghai Institute of Nuclear Research, were chosen due to their work in tomography, which can aid in the non-destructive testing of missile solid fuel and nuclear explosive detonation packages. Since the late 1980s, Fudan University has obtained more than 20 licenses to acquire sensitive U.S. exports.

Risk Report, 1/95-2/95 **(5459)**.

8/27/95

The U.S. announces that it will hold a summit meeting with China to discuss, among other items, arms control and proliferation issues. U.S. Ambassador to the U.N. Madeleine Albright says, "We continue to have serious questions about their [China's] nuclear testing, about some of their policies vis-a-vis transfer of missile technology, [and] some of their threatening behavior towards Taiwan."

Donald Lambro, *Washington Times*, 8/28/95, pp. A1, A8 **(5649)**.

10/4/95

U.S. Undersecretary of State Lynn Davis says the United States would not implement new sanctions against China unless it acquired undeniable proof that China, in violation of MTCR guidelines, sold M-11 missiles to Pakistan. According to Davis, the transaction in question may have occurred before China announced its intention to adhere to the MTCR in 9/94.

Bill Gertz, *Washington Times*, 10/5/95, p. A10 **(5514)**.

10/9/95*

The U.S. House decides to cut funding for the U.S.-China Joint Defense Conversion Commission. The Commission, created by U.S. Defense Secretary William Perry and General Ding Henggao, director of COSTIND, was established in 1994.

William Triplett, *Defense News*, 10/9/95, pp. 23-24 **(5356)**.

10/12/95

Nominee for U.S. ambassador to China, James Sasser, tells the Senate Foreign Relations Committee that classified data indicate China is becoming "more responsible" in its missile sales.

William Scally, Reuter (Washington), 10/12/95; in Executive News Service, 10/13/95 **(5466)**. Michael Dobbs, *Washington Post*, 10/13/95, p. A18 **(5466)**.

10/24/95

During the upcoming 10/24/95 summit between U.S. President Clinton and Chinese President Jiang Zemin at the U.N. in New York, Clinton is expected to communicate U.S. concerns over China's 8/95 missile tests off the northern coast of Taiwan.

Jashon Glashow, *Space News*, 10/16/95-10/22/95, p. 29 **(5460)**.

QATAR

INTERNAL DEVELOPMENTS

9/30/95*

The Qatar Army's field regiment maintains four Astros II multi-barreled rocket launchers and plans to acquire "target acquisition" UAVs.

Jane's Defence Weekly, 9/30/95, pp. 36-38 **(5393).**

ROMANIA

ROMANIA WITH:
Hungary, 168

RUSSIA

INTERNAL DEVELOPMENTS

1995

Russian missile builder Raduga begins test-flying its ramjet-powered Hypersonic Experimental Flying Testbed (GELA). The testbed is apparently intended for development of an air-launched ASM. The current status of the missile project remains unclear.

Flight International, 9/6/95-9/12/95, p. 16 **(5592).**

4/95

The city of Svobodnyy-18 in Amur Oblast is chosen as the site for a new Russian cosmodrome. According to Russian Space Agency sources, it will cost Russia four trillion rubles to build one space launch complex for heavy rocket boosters.

Ogonek (Moscow), 4/95, p.38; in FBIS-UST-95-030, 8/2/95 **(5618).**

Mid-1995

The Russian aircraft design bureau Tupolev reveals its new Tu-300 reconnaissance UAV. The Tu-300 is still under development and only a limited number have been manufactured to date.

Flight International, 8/30/95-9/5/95, p. 7 **(5347).**

Mid-1995

NPO Mashinostroenie says projects to develop the Russian Navy's new ramjet-powered Yakhont and turbojet-powered Alfa ASCMs are in jeopardy because of a shortage in state funding. Mashinostroenia adds that it is financing development of the Yakhont missile project by itself. Both supersonic ASCMs employ inertial mid-course guidance and an active-radar seeker for terminal guidance. The Yakhont is designed to be ship- or submarine-launched while the Alfa can be ship-, submarine-, or air-launched.

Flight International, 8/30/95-9/5/95, p. 8 **(5350).**

Mid-1995

Russia test launches an SS-N-20 SLBM from a Typhoon class submarine which had broken through ice two nautical miles from the North Pole. The SS-N-20's 10 dummy warheads all hit the Chikha missile range with a reported accuracy of 500 m. According to NORAD spokesman Major Robin Alford, Russia gave the U.S. advance notice of the test as required under the provisions of the START agreement. U.S. sensors monitored the SS-N-20 missile's entire flight.

Jane's Defence Weekly, 9/9/95, p. 6 **(5448).**

7/95*

Russia's ISKRA Engineering Design Bureau, which manufactures aerospace products and composite solid-fuel, indicates its readiness to engage in international joint ventures to develop and produce solid-fuel propulsion systems.

Military Parade, 7/95-8/95, pp. 37-40 **(5600).**

7/95*

Reports in *Military Parade* indicate that Russia's Smerch MLRS was developed by the SPLAV State Research and Production Enterprise and was deployed with the Soviet Army in 1986. Each 70 km-range rocket has an on-board flight control unit. In contrast to older unguided rockets of this type, the flight control unit reduces the Smerch rocket's dispersion rate by three times and doubles its firing accuracy.

Military Parade, 7/95-8/95, pp. 130-131 **(5571).**

7/1/95

The Russian government approves a plan by the Russian Space Agency (RSA), the Defense Ministry, and the State Defense Industry committee to convert Russian SS-19 missiles into SLVs. The so-called 'Rockot' will be Russia's third medium-class SLV available on the international space launch market, along with the Proton and Soyuz rockets.

Kommersant-Daily (Moscow), 7/7/95, p. 9; in FBIS-TAC-95-014-L, 7/7/95 **(5596).**

7/17/95*

In a move that will permit major Russian arms producers to independently export their own products, the Russian government begins to break the "near monopoly" of Rosvoorouzhenie, the state-run arms export agency. Critics say Rosvoorouzhenie has not raised enough arms export revenue for the Russian Treasury. Rosvoorouszhenie will continue to oversee Russian arms exports while the Russian Ministry of Foreign Economic Relations will be responsible for export licensing. The new State Committee for Arms Trade Policy will supervise Russia's "trade-related policy." Over the next two years, President Yeltsin's government is reportedly prepared to allow up to 10 companies to export their arms independently. According to a Rosvoorouzhenie spokesman, the Russian government's policy change makes sense because of growing competition on the international arms market. According to Boris Kuzyk, senior advisor to President Yeltsin on the arms trade, Moscow's Almaz Scientific Production Association, which manufactues the S-300 anti-aircraft system, will probably be the first firm to receive government approval to independently export arms.

Anton Zhigulsky, *Defense News*, 7/17/95-7/23/95, pp. 1, 29 **(5608).**

8/95

Sources "close" to the Belarusian Ministry of Defense say Russia's Rosvoorouzhenie is concluding a deal with "one of the Middle Eastern states" to transfer an S-300 air defense system.

MMC (Minsk), 8/14/95; FBIS-TAC-95-016-L, 8/14/95 **(5620).**

8/95

Russia displays the Hercules air defense system at the MAKS-95 international air show. The system can strike targets at a range of several hundred km and at altitudes of up to 40 km. According to Russian Hercules crew members, the missile is superior to the Patriot and "can even zap a satellite during the launch phase."

A. Filippov, Moscow Television Network (Moscow), 8/21/95; in FBIS-TAC-95-005, 8/21/95 **(5384).**

8/19/95*

Russia's new Raduga Kh-101 long-range, conventional cruise missile is ready for flight testing with the Russian Air Force. The Kh-101 was given priority over the Kh-55 missile's planned replacement, the Kh-90 supersonic cruise missile. The Kh-101's designers reportedly concentrated their efforts on producing homing and guidance systems for accuracies of between 12 and 20 m. The Kh-101 will be armed with a conventional warhead containing 400 kg of an "incendiary penetrating charge" and high explosives. It may also incorporate an "electro-optic course correction system" to enhance its inertial navigation system and a "TV-guided terminal homing head." The Kh-101 is scheduled to enter service in 2000.

Piotr Butowski, *Jane's Defence Weekly*, 8/19/95, p. 11 **(5614).**

9/95*

Russia is marketing the 360 km-range Tupolev Tu-243 UAV at several defense exhibitions. The Tu-243 uses an expendable rocket booster for launch and employs a gas turbine engine throughout its flight. The Tu-243's flight control is performed by a pre-programmed on-board computer.

IDR Despatches, 9/95, p. 3 **(5453).**

9/95*

According to an article in Russia's *Inzhener*, "the policy of squeezing Russian firms" out of the international space launch market is forcing several of them to export the technology which they acquired when Russia was "a leading space power."

G. Lomanov, *Inzhener* (Moscow), 9/94, pp. 18-20; in FBIS-UST-95-027, 7/11/95 **(5503).**

9/95

Russian firms display several SLVs and cruise missiles at the Moscow 95 Airshow. The Khrunichev Space Center displays the small Rockot SLV, the prototype Proton-M SLV, and the Angara heavy-launch vehicle. The Rockot's maiden launch is scheduled for 1997 from the Plesetsk cosmodrome, while a 1998 launch date is scheduled for the Proton-M. The Angara utilizes different elements from the Energia, Zenith, and Proton-M SLVs. Maschinostroenie displays the supersonic Yakhont ASCM and the new supersonic Aplha ASCM. The Yakhont is scheduled to make its first "propelled and guided flight" in early 1996. Tupolev displays the 1,000 km-range TU-141 Strij drone.

Jean-Pierre Casamayou, Christian Lardier, Pierre Langereux, *Air & Cosmos/Aviation International* (Paris), 9/1/95, 9/8/95, 9/15/95; in FBIS-UST-95-044, 11/1/95 **(5628).**

9/95

Maschinostroenie announces that it has conducted an unguided test-firing of the Yakhont ASCM. The Yakhont can either be launched vertically or at an angle of 15 degrees from horizontal. With a range of 300 km and a speed of Mach 2.5, the Yakhont can be launched from land, a surface ship, or a submarine. According to a Maschinostroenie official, the Yakhont has undergone 10 to 20 tests and will be ready for deployment in approximately two years. Improvements to the Yakhont's radar seeker allow for target differentiation based radar cross section, electro-magnetic signature, and target location. The new ASCM will be deployed with the Russian Navy and will also be placed on the international export market.

Jane's Defence Weekly, 9/2/95, p. 13 **(5449).**

9/95

Director General of Rosvoorouzhenie Alexander Kotelkin identifies the Middle East as a potentially large market for Russian exports, especially the S-300 air defense system. Russian companies seeking to export defense items must proceed through one of three export organizations—Rosvoorouzhenie, the Moscow Aircraft Production Organization (MAPO), and the Defense Export Organization—and then obtain an export license from the State Committee.

Charles Bickers, *Jane's Defence Weekly*, 9/23/95, p. 40 **(5385).**

9/3/95

Director of the Baikonur Cosmodrome General Alexei A. Shumilin says Russia's Space Forces "will continue to manage" Russia's military space program, but the RSA will progressively take over all other civilian functions. RSA Director General Yuri Koptev confirms that the transfer of nearly

all of Baikonur's civilian operations to the RSA and its industrial partners will be completed by 1997. Koptev says Baikonur will focus its future efforts on developing business ventures with the West. The role of Russia's Military Space Forces in the final assembly and launch of civilian space rockets will be decreased radically.

Peter B. de Selding, *Space News*, 9/11/95-9/17/95, pp. 2, 20 **(5504).**

9/5/95

Russia conducts successful flight-design tests of the Topol-M2 (RS-12M2) missile at the state test site in Mirnyy, Arkhangelsk Oblast. The three-stage, solid-fuel Topol-M2 was developed by the Moscow Thermal Equipment Institute under the direction of Boris Lagutin and is designed for silo-deployment. Commander of Russia's Strategic Missile Forces (SMF) Colonel General Igor Sergeyev says the Topol's performance parameters are ideal and that it will cost less to produce compared to other missile systems.

Aleksandr Dolinin, *Krasnaya Zvezda* (Moscow), 9/7/95, p. 1; in FBIS-SOV-95-177, 9/7/95 **(5502).** *Krasnaya Zveyda*, 9/7/95, p. 1 **(5639).**

9/14/95

The Ministry of Fuel and Power Engineering cuts off power to Russia's Plesetsk missile test site in Arkhangelsk which forces the shutdown of all Topol-M testing activities. Although the cut-off lasts only one hour, the SRF places armed officers at power substations supplying Plesetsk to prevent further shutdowns. Russia's Strategic Rocket Forces (SRF) have been unable to pay their electricity bills for several months and owe a reported 17 billion rubles in back payments; the SRF owes a reported 70 billion rubles throughout the whole of Russia. Deputy Commander of the SRF Colonel General Vladimir Nikitin blames the government's handling of the military budget for the SRF's inability to pay its power bills.

NTV (Moscow), 9/15/95; in FBIS-SOV-95-180, 9/15/95 **(5598).**

9/15/95

SRF Deputy Commander Vladimir Nikitin says that further power shut-offs could jeopardize the SRF's ability to guarantee the safety of Russia's nuclear weapons.

Reuter, 9/15/95; in Executive News Service, 9/15/95 **(5601).**

9/24/95

Russian Prime Minister Viktor Chernomyrdin issues a government order making it illegal to cut off electricity supplies to any military or defense industry facilities in Russia.

Reuter, 9/24/95; in Executive News Service, 9/24/95 **(5630).**

9/25/95

An unidentified Russian lieutenant general says that if NATO expands eastward, Russia will be forced to sell missile and nuclear technology to countries such as India, Iran, Iraq, and—if Islamic forces take power in that country—even Algeria. The general says that military partnerships with these countries, especially Iran, will also be a possibility. The general is interviewed by an unidentified reporter following a speech delivered by Russian Defense Minister Pavel Grachev.

Zavtra (Moscow), 10/95, pp. 1,6; in FBIS-SOV-95-205, 10/24/95 **(5382).**

9/28/95*

Russia's Rosvoorouzhenie will showcase its S-300V SAM system at the Defense Seoul-95 arms exhibition in South Korea. Head of the Russian delegation, Vladmir Lebed, says the system is superior to many of its foreign competitors, including the U.S. Patriot anti-missile system.

Rossiskaya Gazeta, 9/28/95, p. 1 **(5434)**.

10/3/95

The Russian Defense Ministry's new military doctrine reportedly calls into question international structures that monitor the proliferation of WMD and asserts that Russia alone will determine the permissibility of future missile technology sales to India, Iran, Iraq, and Algeria.

Aleksandr Lyasko, *Komsomolskaya Pravda* (Moscow), 9/29/95-10/6/95, p. 2; in FBIS-SOV-95-191, 10/3/95 **(5593).**

10/4/95*

Russia is experimenting with a next-generation, long-range ALCM—probably the Raduga Kh-101 cruise missile—at the Russian Air Force's Ahktubinsk test-site. The conventionally armed Kh-101 missile, which has a reported range of "over 2,770 km (1,500 nm)" traveling at subsonic speeds, will probably be fitted on-board Russia's Tupolev Tu-160 Blackjack, Tu-95 Bear H, and Tu-22M3 Backfire bombers. The Kh-101 project may have been boosted by Russia's cancellation of the Kh-90 supersonic cruise missile program due to inadequate funding.

Flight International, 10/4/95-10/10/95, p. 30 **(5602).**

10/6/95

Russia gives seven companies the authority to sell their products directly on the international arms market. According to Boris Kuzyk, Russian President Boris Yeltsin's advisor on the arms trade, Russia alters its arms export strategy because of ferocious competition in the global arms market. S-300V manufacturer Antei is one of the seven companies affected by this decision. According to Rosvoorouzhenie, Russian defense exports totalled $1.7 billion in 1994. This figure is expected to increase to as much as $2.6 billion in 1995.

Anton Zhigulsky, *Defense News*, 10/16/95-10/22/95, p. 64 **(5452).**

10/9/95*

Russia's STC Complex is marketing two types of converted SS-25 missiles as SLVs: the four-stage Start-1 SLV and the five-stage Start SLV.

Warren Ferster, *Space News*, 10/9/95-10/15/95, pp. 1, 20 **(5610).**

10/10/95

The SRF test-fires an RS-12M Topol M ICBM from the Plesetsk Cosmodrome. SRF Commander Igor Sergeyev says that the missile landed on target with "exquisite precision." Sergeyev says the test is intended to verify the combat readiness of the support personnel and the technical performance of the missile's boosters.

Anatoliy Yurkin, Itar-Tass (Moscow), 10/10/95; in FBIS-SOV-95-196, 10/10/95 **(5595).**

10/13/95

Russian President Boris Yeltsin signs the federal law "On State Regulation of Foreign Trade Activity." The law sets forth the Russian Federation's general principles and authority for regulating foreign trade activity,

including "military-technical cooperation and cooperation with foreign states in the missile-space sector." The new Russian law establishes a new system of export controls to constrain the trade in arms, military equipment, dual-use technology, and other materials, that could contribute to the proliferation of WMD, missiles capable of delivering WMD, and other dangerous weapons and technologies.

Rossiyskya Gazeta (Moscow), 10/24/95, pp. 4-5; in FBIS-SOV-95-213-S, 10/24/95 **(5629).**

10/26/95*

Russia conducts a successful test-launch of a new tactical missile at the Ministry of Defense's State Central Test Range. The mobile, highly accurate, integrated tactical missile system is being developed for Russia's ground forces. Colonel General Anatoliy Sitnov, Chief of Armament of the Russian Federation's Armed Forces, says the new missile meets INF Treaty requirements. Sitnov also says that no similar missile systems exist anywhere else in the world. The test-launch is executed under the direction of Mikhail Kolesnikov, Chief of the Russian Armed Forces General Staff. Kolesnikov asserts that the new missile is "the weapon of the 21st century."

Russian Public Television First Channel Network (Moscow), 10/26/95; in FBIS-TAC-95-006, 10/26/95 **(5623).** Russian Public Television First Channel Network (Moscow), 10/27/95; in FBIS-TAC-95-006, 10/27/95 **(5623).**

RUSSIA WITH:

RUSSIA WITH SOUTH KOREA

8/30/95

A South Korean official says, to protect itself against North Korean No-dong SSMs, the ROK may jointly produce the S-300 ATBM with Russia.

Naoaki Usui, *Defense News*, 9/11/95-9/17/95, p. 14 **(5537)**.

9/27/95-9/28/95

Russian Prime Minister Viktor Chernomyrdin discusses military cooperation with South Korean leaders during the Seoul Defense-95 arms exhibition.

Defense News, 10/9/95-10/15/95, p. 12 **(5533)**.

10/3/95

Alexy Kudryashov of the Russian state import/export company, Rosvoorouzhenie, says Russia is planning to sell weapons to South Korea and is also seeking joint weapons development projects. Among the planned projects is the updating of Russian Igla anti-aircraft missiles and possibly the development of a medium-range missile.

Defense News, 10/9/95-10/15/95, p. 12 **(5533)**.

10/17/95

Boris Saltykov and Chong Kun-mo, the Ministers of Science and Technology of Russia and South Korea respectively, agree on a plan to transfer 15 Russian military technologies to South Korea for civilian industrial applications. Among the technologies to be transferred is a ICBM guidance system for automobile automatic operating devices and "for automatic navigation devices for ships and vessels." Russia and South Korea may also work together on future projects involving "dual-purpose technologies, new materials, biotechnology and controlled thermo-nuclear reaction."

Son Yong-kyu, *Hanguk Ilbo* (Seoul), 10/18/95, p. 2; in FBIS-EAS-95-201, 10/18/95 **(5650)**. Nikolay Geronin, Itar-Tass (Moscow), 10/16/95; in FBIS-SOV-95-200, 10/16/95 **(5650)**.

RUSSIA WITH SYRIA

9/95*

Russia has previously exported the 150 km-range Tupolev Reys (Voyager) UAV to Syria.

IDR Despatches, 9/95, p. 3 **(5453).**

9/95

Russian Defense Minister Pavel Grachev says Russia stopped transferring long-range missiles to Syria three years ago. Syria is reported to be $11 billion in debt to Moscow.

Hayim Hecht, Qol Yisra'el (Jerusalem), 9/15/95; in FBIS-NEW-95-179, 9/15/95 **(5621).**

RUSSIA WITH UKRAINE

7/31/95*

Russia's RSC Energia and Ukraine's NPO Yuzhnoye are discussing a "stock swap" with one another. Russia and Ukraine are close to reaching a bilateral space agreement.

James R. Aster, *Aviation Week & Space Technology*, 7/31/95, p. 19. **(5607).**

10/30/95

Colonel Oleksandr Serdyuk, head of the Strategic Forces Administration of Ukraine's Defense Ministry, announces that nuclear warheads have been removed from 90 percent of the strategic nuclear missiles on Ukrainian territory. The warheads were removed as part of a 1/94 agreement with the U.S. and Russia to dismantle Ukraine's 130 SS-19 and 46 SS-24 missiles and to transfer the warheads to Russia in exchange for nuclear power plant fuel. Serdyuk says all Ukraine's SS-24 missiles were dismantled by 10/94 and that thus far 80 of the 130 SS-19 ICBMs have beeen dismantled. Although Russia retains operational control over the remaining 10 percent of the missiles in Ukraine, Serdyuk asserts that Ukraine retains administrative control of the nuclear forces on its territory.

AFP (Paris), 10/30/95; in FBIS-SOV-95-210, 10/30/95 **(5613).** Interfax (Moscow), 10/30/95; in FBIS-SOV-95-210, 10/30/95 **(5613).**

RUSSIA WITH UKRAINE AND UNITED STATES

Mid-1995

The U.S. firm Pratt and Whitney receives an RD-120 rocket engine from NPO Energomash in Russia. The transfer is the first step in a joint venture between the two companies to market a modified version of the upper stage Zenit rocket engine. The new RD-120M engine will be manufactured in Russia and Ukraine, and will constitute the first stage of a new, small SLV.

Flight International, 7/26/95-8/1/95, p. 20 **(5346).**

RUSSIA WITH UNITED STATES

Late 4/95

The U.S.'s GRA Trading Company Inc. brokers a deal in which Russia's Rosvoorouzhenie sells a top secret S-300 anti-aircraft missile system to the U.S. for $100 million. The S-300, which can strike down tactical missiles, cruise missiles, and other airborne targets at elevations of up to 30 km, is designed by Antei and built by Novator. The S-300 can also track 200 targets concurrently, and can reportedly detect "stealth" aircraft with a "99 percent guarantee" of destruction.

Denis Baranets, *Moscow News*, 10/6/95-10/12/95, p. 5 **(5617).** *Moscovskie Novosti*, 10/1/95-10/8/95, p. 29 **(5637).**

6/30/95

The U.S. agrees to stop opposing Russia's participation in the "New Forum," the organization to replace COCOM. States with "viable nationally-based export control regimes," and which adhere to the MTCR, the NPT, and the chemical/biological weapons accords will be eligible for membership in the New Forum.

Barbara Starr, *Jane's Defence Weekly*, 8/5/95, p. 5 **(5267).**

Mid-1995

Russia delivers two NK-33 rocket engines to Aerojet in Sacramento, California, to be tested for possible use in the U.S. Air Force's Evolved Expendable Launch Vehicle (EELV) project. The engines are provided as part of a joint venture between Aerojet and Russia's Samara State Scientific and Production Enterprise-NK Engines.

Defense News, 7/24/95-7/30/95, p. 12 **(5344).**

8/9/95

The U.S. Defense Nuclear Agency announces plans for the construction of a closed-burn solid rocket motor (SRM) destruction facility in Perm, Russia. The planned facility will eliminate 30 percent of Russia's SRMs by 12/31/00. Russia will maintain control over the status of the missile cases, insulation, and other subcomponents.

Post-Soviet Nuclear & Defense Monitor, 9/1/95, pp. 3-4.

9/94*

The RAMKON organization, set up by the Makeyev design bureau and other Russian defense enterprises, establishes a joint venture with the U.S. corporation Sea Launch Investors to use converted SS-N-6, SS-N-8, and SS-N-18 SLBMs for commercial space launches. Two test launches of converted SLBMs have been conducted to date.

G. Lomanov, *Inzhener* (Moscow), 9/94, pp. 18-20; in FBIS-UST-95-027, 7/11/95 **(5503).**

9/29/95

The Clinton administration adopts a policy which allows excess Russian ballistic missiles to compete with U.S. rockets in the commercial space launch market. The U.S. position is adopted after a meeting with Russian delegates at the START Joint Compliance and Inspection Commission in Geneva. Although the new policy will eventually permit the use of all excess foreign ballistic missiles for space launch purposes in the U.S., only Russia and Ukraine are affected at this point. The U.S. will review requests to launch American-made satellites on converted foreign missiles on a case-by-case basis.

Warren Ferster, *Space News*, 10/9/95-10/15/95, pp. 1, 20 **(5610).**

10/4/95

Deputy Director General of the Russian Space Agency Yuri Milov says that Russia has plenty of SS-25 missles to satisfy the U.S.'s space launch demands.

Warren Ferster, *Space News*, 10/9/95-10/15/95, pp. 1, 20 **(5610).**

10/9/95*

The U.S.'s EarthWatch Inc. of Colorado is granted permission by the U.S. government to launch its EarlyBird remote-sensing satellite on-board a Russian Start-1 booster in 1996.

Warren Ferster, *Space News*, 10/9/95-10/15/95, pp. 1, 20 **(5610).**

10/9/95

Russian Prime Minister Chernomyrdin signs a resolution determining the cooperative basis between Samarsk AO and the U.S.'s Aerojet for the installation of Russian engines on American SLVs.

Andrei Baranovski, *Legodnya*, 10/20/95, p. 4 **(5640).**

10/20/95*

The U.S.'s Aerojet announces that it has successfully test-fired a Russian NK-33 liquid-fuel rocket engine for the first time.

Andrei Baranovski, *Legodnya*, 10/20/95, p. 4 **(5640).**

SAUDI ARABIA

SAUDI ARABIA WITH:
France, 167

SERBIA

SERBIA WITH:
Bosnia and Russia, 162

SLOVAKIA

SLOVAKIA WITH:
Azores and Ecuador, 161

SOUTH AFRICA

INTERNAL DEVELOPMENTS

7/3/95*

South Africa's Kentron test-flies a "second-generation stand-off weapon" which has range and speed capabilities similar to the U.S. AGM-130E. The new weapon can be launched from the South African Air Force's (SAAF) two-seater Cheetah D aircraft, although it is not known if a prototype is available yet. U.S. officials assert that the "new standoff weapon is stealthy." Kentron has also developed the H-3 "powered glide bomb" by adding a micro rocket motor to its H-2 glide bomb. The H-3 project was apparently terminated after one successful test-flight because of financial constraints. According to the SAAF, all of the H-3s have been "retired," but conflicting reports from industry officials and former officers assert that a number of H-3s were retained and more could be produced quickly on demand.

Aviation Week and Space Technology, 7/35/95, pp. 55-58 **(5321).**

7/3/95*

Officials from South Africa's Overberg Toersbaan (OTB) test range hope that South Africa's entry into the MTCR by the end of 1995 will allow it to conduct future space launches. The OTB site, which is run by the Denel aerospace firm, was intended originally for use in a South African satellite and space launch program, but the project was shelved as a reult of "missile treaty agreements." The range is currently being used to test tactical missiles and aircraft. According to General Manager Jan Malan, OTB is focusing on testing longer range systems in particular.

Aviation Week and Space Technology, 7/3/95, pp. 62-65 **(5479).**

7/3/95*

South Africa's Kentron is offering its Flowchart 2 UAV for use as a "target drone." U.S. officials worry that the Flowchart 2 could be armed with a warhead or used as a "stealthy reconnaissance UAV" upon export.

Aviation Week and Space Technology, 7/3/95, pp. 62-65 (5479).

9/9/95*

The South African government establishes the National Conventional Arms Control Committee (NCAC) to regulate the export of Armscor defense items. Headed by a minister with no official defense industry ties, the NCAC will maintain an independent inspectorate to monitor the committee's work and to report directly to the South African Senate and National Assembly defense committees. South Africa's defense exports will no longer be regulated by country classification, but will be evaluated in terms of their potential contribution to human rights violations, regional instability, and terrorist activities; their potential for diversion for re-export; and their possible negative repercussions for South Africa's trade and foreign policies. The NCAC has already denied export requests to two countries, and may be responsible for blocking exports to Turkey, which forced some South African companies to break contractual obligations.

Helmoed Roemer, *Jane's Defence Weekly*, 9/9/95, p. 4 (5319).

11/1/95*

South Africa releases the first pictures of Kentron's modular precision stand-off weapon (MUPSOW) prototype, which can be mounted on the South African Air Force's (SAAF) Atlas Cheetah aircraft. MUPSOW will replace the SAAF's H-2 stand-off glide bomb, which was used during the war in Angola.

Flight International, 11/1/95-11/7/95, p. 14 **(5482).**

SOUTH AFRICA WITH:

CIS, France, and United States, 165
MTCR, 181
Pakistan, 185

SOUTH KOREA

INTERNAL DEVELOPMENTS

10/11/95

South Korean Defense Minister Yi Yang-ho announces that South Korea will soon begin research and development of short-range SAMs. The ROK National Assembly Defense Committee has been critical of the Biho 30mm low-altitude anti-air gun—to be produced in 1999—because its 2.5 km range is considered insufficient to counter North Korean Scuds or attacking aircraft.

Korea Herald, (Seoul), 10/12/95, p. 3; in FBIS-EAS-95-200, 10/12/95 **(5535)**.

SOUTH KOREA WITH:

Iran and North Korea, 173
Israel, 176
Japan, 179
MTCR, 181
New Forum, 182
North Korea, 184
Russia, 192

SOUTH KOREA WITH UNITED STATES

7/10/95

South Korean Foreign Minister Kong Nomyong announces his government's intention to abolish a 1979 memorandum of understanding with the U.S. prohibiting Seoul's development of SSMs with ranges of more than 180 km and payloads over 500 kg. The MoU also bans South Korea from importing missile components from third countries and places restrictions on its civilian space program. South Korea reconfirmed the MoU in 8/90, agreeing to inform the U.S. if it exceeded these limitations.

Pak Chae-pom, *Seoul Sinmun*, 7/12/95, p. 6; in FBIS-EAS-95-133 **(5343)**. Kim Tang, *Sisa Journal* (Seoul), 10/12/95, pp. 20-24; in FBIS-EAS-95-196, 10/12/95 **(5373)**. *Tong-a Ilbo* (Seoul), 10/9/95, p. 1; in FBIS-EAS-95-195, 10/9/95 **(5379)**. *Hanguk Ilbo* (Seoul), 9/26/95, p. 3; in FBIS-EAS-95-186, 9/26/95 **(5446)**. *Korea Herald* (Seoul), 10/12/95, p. 3; in FBIS-EAS-95-200, 10/12/95 **(5535)**. *Hanguk Ilbo* (Seoul), 10/31/95, p. 2; in FBIS-EAS-95-210, 10/31/95 **(5548)**.

8/21/95-9/1/95

The U.S. and the ROK hold the Ulchi-Focus Lens exercise, during which the joint U.S.-South Korean system for detecting and intercepting North Korean Scud missiles proves to be inadequate; computer simulations are used to test the system. In 9/95, U.S. and South Korean leaders say problems with the current system require that an effective strategy to counter North Korean missiles be adopted as soon as possible.

Son Tae-kyu, *Hanguk Ilbo* (Seoul), 10/4/95, p. 1; in FBIS-EAS-95-193, 10/4/95 **(5534)**.

9/13/95

The South Korean Ministry of National Defense announces that the ROK Army will spend $700 million on acquiring ATACMS and MLRS systems from the U.S. between 1996 and 1999.

Choson Ilbo (Seoul), 9/14/95, p.2; in FBIS-EAS-95-178, 9/14/95 **(5256).**

9/25/95

South Korea's Defense Ministry announces the U.S. rejection of its request to abolish a 1979 MoU restricting ROK missile development and imports.

Son Ki-yong, *Korea Times* (Seoul), 9/26/95, pp. 1-2; in FBIS-EAS-95-186, 9/26/95 **(5446)**.

10/11/95

South Korean Defense Minister Yi Yang-ho says South Korea will try to eliminate restrictions on its missile development imposed by the ROK-U.S. Memorandum on Missile Control. According to Yi, the agreement does not allow South Korea to adequately confront the danger posed by North Korean missiles and places unnecessary controls on peaceful space programs run by private industry.

Yonhap (Seoul), 10/11/95; in FBIS-EAS-95-196, 10/11/95 **(5374)**.

SPAIN

SPAIN WITH:

Canada, Germany, Netherlands, and United States, 164
Egypt, 166

SUDAN

SUDAN WITH:

Iran and Iraq, 173

SWEDEN

SWEDEN WITH:

Australia and Russia, 161

SYRIA

INTERNAL DEVELOPMENTS

8/30/95*

The Israeli defense establishment reports that Syria has the capability to indigenously produce Scud missiles including the Scud-C, a SSM that can target the whole of Israel with conventional and chemical warheads. Syria reportedly has 60 ballistic missile launchers and has performed numerous Scud launching drills and Scud-C tests.

Channel 2 Television Network (Jerusalem), 8/30/95; in FBIS-NES-95-169, 8/31/95 **(5425).**

SYRIA WITH:

Germany, 168
Israel, 176
Russia, 192

TAIWAN

INTERNAL DEVELOPMENTS

9/19/95*

In response to China's continued missile tests, Taiwan has deployed 170 km-range Hsiung Feng anti-ship missiles on the island of Tung-yin, near China's Fujian province. Taiwan originally planned to deploy the missiles on Peng-chia, an island 50 km off the northern tip of Taiwan, but decided not to because of possible Japanese protest over potential targeting of the Senkaku islands.

Kyodo (Tokyo), 9/19/95; in FBIS-CHI-95-163, 9/19/95 **(5523)**. *Krasnaya Zveda* (Moscow), 10/3/95, p. 3 **(5546)**.

10/95*

Taiwan is developing the 600 to 950 km-range Tien Ma missile.

International Institute of Strategic Studies, *Military Balance 1995-1996*, 10/95, pp. 281-285 **(5569)**.

10/11/95

Taiwan's Defense Minister Chiang Chung-ling says Taiwan has already begun missile defense research as part of the defense budget for the fiscal year ending 6/30/96. Some 300 billion New Taiwan dollars ($11 billion) is allocated for the next fiscal year, up 20 percent from FY 1995-96. Taiwan is also considering the purchase of additional Patriot air defense systems.

Benjamin Yeh, CNA (Taipei), 10/12/95; in FBIS-CHI-95-197, 10/12/95 **(5526)**.

10/13/95

In the Taiwanese Legislative Yuan, National Defense Minister Chiang Chung-ling says that the military will strengthen air defense capabilities by pursuing indigenous missile development and purchasing foreign theater missile defense (TMD) systems.

Bear Lee, CNA (Taipei), 10/14/95; in FBIS-CHI-95-200, 10/14/95 **(5519)**.

10/20/95*

A third base for the Tien Kung SAM will be established on the offshore island of

Penghua by 6/96. To achieve maximum interception potential, the 200 km-range Tien Kung is expected to be deployed at six bases, including the Tungyin base. The Tien Kung-1—which is not yet mass produced—has already been deployed on two mainland Taiwan bases. The Taiwanese military recently completed missile tests combining Tien Kung-1 and Tien Kung-2 missiles.

Chung-Kuo Shih-Pao (Taipei), 10/20/95, p. 2; in FBIS-CHI-95-206, 10/20/95 **(5510)**. Benjamin Yeh, CNA (Taipei), 10/21/95; in FBIS-CHI-95-204, 10/21/95 **(5521)**.

10/23/95*

Taiwanese Navy Commander Ku Chung-lien says Taiwan plans to acquire Northwest Wind and Revenger tactical missiles.

Tzu-Li Wan-Pao (Taipei), 10/23/95, p. 3; in FBIS-CHI-95-213, 10/23/95 **(5644)**.

TAIWAN WITH:
France, 167
PRC, 188

TAIWAN WITH UNITED STATES

7/12/95*

The U.S. is reported to have pressured Taiwan into stopping development of its 1,000 km-range "Sky Horse" guided missile.

Pak Chae-pom, *Seoul Sinmun*, 7/12/95, p. 6; in FBIS-EAS-95-133 **(5343)**.

7/13/95

Taiwan launches its fifth indigenously built missile frigate, the Tzu Yiat, at the state-run China Shipbuilding Corporation's (CSBC) Kaohsiung shipyard. Equipped with advanced radar, torpedoes, rockets, SSMs, SAMs and indigenously built Hsiung Feng-2 missiles, the Tzu Yi design is based on the U.S. Perry-class frigate. Tzu Yi is one of eight such frigates ordered under the ROC Navy's "Kwanghua No. 1" warship modernization plan, which is intended to upgrade Taiwan's naval defense. Navy Commander-in-Chief Admiral Ku Chung-lien says the eighth frigate has been canceled due to a budget shortfall. The U.S. provided the technology and materials for the first two frigates, while the Chungshan Institute of Science and Technology will integrate the ships' weapons systems.

Sofia Wu, CNA (Taipei), 7/13/95; in FBIS-CHI-95-135, 7/13/95 **(5551)**.

7/26/95

The last three of six Knox-class frigates on lease from the U.S. to Taiwan dock at the Tsuoying naval base. The frigates, which are intended to counter Chinese submarines operating in the deep waters off Taiwan's east coast, are equipped with Harpoon SSMs and other advanced weapon systems. They are intended to form part of a new anti-submarine flotilla, "Fleet 168" to be based at Chungcheng Naval Base in the northeastern city of Suao, Ilan County.

Benjamin Yeh, CNA (Taipei), 7/25/95; in FBIS-CHI-95-143, 7/26/95 **(5550)**. Sofia Wu, CNA (Taipei), 7/5/95; in FBIS-CHI-95-151, 7/5/95 **(5550)**.

10/23/95*

Taiwan may discuss participation in development of the U.S. Theater Missile Defense (TMD) system during its annual arms acquisition meeting with the U.S. in 1996. Development costs, Chinese opposition, and the delicate issue of establishing an early warning satellite system for TMD operation may prevent Taiwan from joining. The anti-missile system could use an advanced phased array radar system as a substitute for a satellite system, according to military sources.

Chung-Kuo Shih-Pao (Taipei), 10/23/95, p. 1; in FBIS-CHI-95-213, 10/23/95 **(5520)**.

THAILAND

THAILAND WITH:
Israel, 177

THAILAND WITH UNITED STATES

7/95

Thailand suspends its purchase of the Shadow-600 UAV from the U.S.'s AAI Corporation pending a determination by Thai officials that the U.S. military supports the system and that Shadow is not a prototype. USAF General Kenneth Israel, director of the U.S. Defense Airborne Reconnaissance Office, comments that the Shadow-600 UAV is a new system, while Susan Boyd, spokeswoman for the U.S.'s UAV Joint Project Office, adds "the U.S. Army does not supply spare parts for the Shadow-600." Thai officials reportedly based their decision to purchase the Shadow-600 on AAI's advertisement of the UAV as an upgraded Pioneer.

Jason Glashow, *Defense News*, 8/7/95, pp. 4, 26 **(5477).**

Early 8/95

A Thai delegation inspects AAI's Shadow UAV to determine whether it is a prototype and whether it can be supported with spare parts and other equipment. AAI Spokesman Paul Guse claims the Royal Thai Army has said the Shadow meets "initial requirements," and he predicts a contract by 9/95. Thailand will reportedly seek new contract bids for its UAV requirement if both the Shadow and Searcher prove to be prototypes.

Jason Glashow, *Defense News*, 8/7/95, pp. 4, 26 **(5477).**

10/95

Thailand's Royal Air Force orders McDonnell Douglas (MDC) AGM-84 Harpoon missiles as part of a deal to acquire eight MDC F-18C/Ds from the U.S. Thailand allocates 10 billion baht ($400 million) from its 1995-1996 defense budget for the MDC F-18C/D package, but insists that it will proceed with the purchase only if the deal includes Hughes AIM-120 advanced medium-range air-to-air missiles (AMRAAM). The U.S. State Department has yet to clear the AMRAAM sale although further talks are scheduled with Thailand in 10/95. Before the deal can proceed, the U.S. Congress requires a 50-day notification of the transfer.

Paul Lewis, *Flight International*, 10/25/95-10/31/95, p. 15 **(5389).**

TURKEY

INTERNAL DEVELOPMENTS

9/95

Turkish companies reveal designs for two

multiple rocket launchers in order to fulfill the needs of Turkey's Land Forces.

Jane's Defence Weekly, 9/30/95, p. 15 **(5616).**

TURKEY WITH UNITED STATES

9/16/95*

The Turkish Army reportedly considers acquisition of additional Multiple Launch Rocket Systems (MLRS) from the U.S. defense firm Loral Vought. The Turkish Army already has 15 MLRS systems that were deployed between 1989 and 1992.

Jane's Defence Weekly, 9/16/95, pp. 30, 34 **(5387).**

9/20/95

Turkey's Prime Minister Tansu Ciller resigns, prompting speculation that several Turkish defense orders might be delayed. According to Robert Costa, Raytheon's manager for the Patriot project, his firm must wait to see whether the resignation will result in "changes in Turkey's attitude on defense procurement policies." Raytheon says it expects to initiate discussions with Turkey over the sale of its Patriot SAM in the near future.

Umit Enginsoy, *Defense News*, 9/25/95-10/1/95, pp. 3, 45 **(5424).**

UKRAINE

INTERNAL DEVELOPMENTS

8/95

Ukraine's Cabinet of Ministers approves regulations to control the import and export of missile-related technology, materials, and equipment. The Ukrainian government also approves a list of missile-related items to be controlled, including complete ballistic missile systems, SLVs, and research rockets that are capable of delivering a payload to a range of 300 km or more. The associated manufacturing technologies and equipment used to produce these systems are also controlled.

Kommersant-Daily (Moscow), 8/12/95, p. 3; in FBIS-SOV-95-157, 8/12/95 **(5348).** *Kommersant-Daily* (Moscow), 8/12/95, p. 3; in FBIS-TAC-95-016-L, 8/12/95 **(5626).**

8/95

Ukraine's Air Defense Troops "demonstrate" an S-300 missile defense system near Kherson. Commander of the Air Defense Troops Colonel General Mykhaylo Lopatin says the S-300 outperforms the Patriot missile system. The S-300 was developed jointly by Ukraine and Russia.

Holos Ukrayiny (Kiev), 9/2/95, p. 1; in FBIS-TAC-95-005, 9/2/95 **(5383).**

8/28/95*

Ukraine's two-stage, liquid-fuel Zenit-2 rocket enters the commerical space launch market.

Aviation Week and Space Technology, 8/21/95, p. S6 **(5426).**

8/31/95

Ukraine successfully conducts the first commercial launch of its three-stage Tsyklon SLV, placing two remote-sensing satellites into orbit; the launch takes place at the Plesetsk Cosmodrome in northern Russia. The first and second stages of the Tsyklon SLV are based on SS-9 missiles. The rocket is built in Dnepropetrovsk, at the Yuzhnoye Design Office. According to Victor Chernyy, director of planning for Eastern Europe and the former Soviet republics at Garber International Associates Inc., the Tsyklon launch will help Ukraine to gain a foothold in the commercial satellite launch market.

Lon Rains, *Space News*, 9/4/95-9/10/95, p. 10 **(5451).**

9/95

Ukrainian Defense Minister Valeriy Shmarov says Ukraine is on schedule for meeeting its disarmament obligations under START I. Ukraine has dismantled 80 missiles thus far and has taken four missile complexes off alert at Khmelnitskiy.

Natalya Kondratyuk, Russian Public Television First Channel Network (Moscow), 9/29/95; in FBIS-SOV-95-190, 9/29/95 **(5450).**

UNITED ARAB EMIRATES (UAE)

UAE WITH UNITED STATES

7/21/95-7/25/95

In talks with U.S. Vice President Al Gore, U.S. Defense Secretary William Perry, and Vice Chairman of the U.S. Joint Chiefs of Staff William Owens, UAE Chief of Staff Lieutenant General Mohammed Bun Zayad Al-Nahyan asks the U.S. to approve the export to the UAE of High-Speed Anti-Radar Missiles (HARMs), Standoff Land Attack Missiles (SLAMs), and GBU-15 precision glide bombs. According to an industry expert, if the U.S. proceeds with the deal, it will transfer the earlier Block II or Block III versions of HARM as opposed to the Block IV variant currently in service with U.S. armed forces. The U.S. has never exported SLAM and has only transferred HARM to South Korea and NATO countries. The UAE has linked its missile export request to the success of a pending $8 billion weapons purchase from the U.S. that includes up to 80 advanced fighter aircraft.

Philip Finnegan, *Defense News*, 8/7/95-8/13/95, pp. 4, 26 **(5496).**

UNITED KINGDOM

UNITED KINGDOM WITH UNITED STATES

10/4/95

U.S. Department of Defense officials sign a $284 million contract for the transfer of 65 conventionally-armed Tomahawk cruise missiles to the U.K. The transfer will represent the first time the U.S. has exported the Tomahawk land-attack cruise missile.

Defense News, 10/23/95, p. 38 **(5608).**

10/16/95

U.K. Defense Secretary Michael Portillo announces the Tomahawk acquisition during a defense debate in the House of commons. U.K. officals are scheduled to sign the contract by 10/24/95. The Tomahawks will be deployed on the U.K.'s Trafalgar and Swiftsure classes of nuclear-powered, hunter-killer submarines.

Defense News, 10/23/95, p. 38 **(5608).**

UNITED STATES

INTERNAL DEVELOPMENTS

6/95

Major General Ken Israel, head of the Defense Airborne Reconnaissance Office (DARO), predicts that under certain restrictions and depending on security classifications, the U.S. will export endurance UAV technology. Some senior U.S. defense officials worry that exports of long-range and high-payload UAV technology will violate MTCR guidelines. States from Europe and the Middle East have apparently expressed interest in purchasing the medium-altitude Predator UAV and the stealthy DarkStar UAV, which cost $3.2 and $10 million respectively.

David A. Fulghum, *Aviation Week and Space Technology*, 7/10/95, pp.40-43 **(5311).**

10/95*

The Department of Defense (DOD) suggests that restrictions on supercomputer sales to countries with long-range missile and nuclear weapon programs should be lifted. Under the proposal, countries such as Israel, India, and Pakistan would only be required to pledge that such imported computers would be used for non-military purposes. Since 1993, computers capable of performing 1,500 million theoretical operations per second (MTOPS) have been classified as supercomputers in the U.S. The DOD proposes to increase the designation of supercomputers to those capable of performing between 7,000 and 10,000 MTOPS. According to a DOD memo, Pentagon engineers use computers capable of performing between 1,000 and 10,000 MTOPS to develop infrared trackers to pick-up incoming missiles, to develop ground radars for theater missile defense, and to design rocket motors. The U.S. Arms Control and Disarmament Agency and the U.S. Department of Energy argue that the current requirement to individually license machines capable of 500 MTOPS or greater should remain in place for those countries believed to be manufacturing WMD.

Risk Report, 10/95, pp. 1, 12 **(5484).** *Intelligence Newsletter*, 10/12/95, p. 3 **(5646).**

10/6/95

President Clinton removes all U.S. export restrictions on computer sales to NATO and other Western allies and increases the limit at which licenses are needed for two other country categories. Under the new regulations, individual export licenses are needed for exports of computers capable of performing over 10,000 MTOPS to Central European and Pacific Rim countries. In addition, any exports to these countries of computers capable of performing over 20,000 MTOPS may require safeguard measures at the end-user site. Individual licenses are also required for exports of computers capable of performing between 2,000 and 7,000 MTOPS to countries which are believed to be involved in nuclear proliferation, including China, Israel, and countries in the former Soviet Union. Iran, Iraq, Libya, and North Korea remain under a complete computer export embargo. The decision to ease export restrictions has been criticized because it is believed that increased access to supercomputers will help China, India, Pakistan, Israel, and other nations to develop nuclear weapons.

Pat Cooper and Theresa Hitchens, *Defense News*, 10/16/95, p. 26 **(5485).** *Intelligence Newsletter*, 10/12/95, p. 3 **(5646)**. *New York Times*, 10/7/95, p. 2 **(5646)**. Bill Gertz, *Washington Times*, 10/5/95, p. A10 **(5657)**.

10/23/95*

The U.S. Navy's 1994 Naval Intelligence Posture Statement asserts that the biggest threat to the world's naval forces in the next two decades will be from over 100 different types of ASCMs that are either planned, under development, or in production.

Robert Holzer, *Defense News*, 10/23/95-10/29/95, p. 10 **(5565).**

UNITED STATES WITH: