Russia Missile Chronology

2007-2000

1999-1996

Last update: March 2009

This annotated chronology is based on the data sources that follow each entry. Public sources often provide conflicting information on classified military programs. In some cases we are unable to resolve these discrepancies, in others we have deliberately refrained from doing so to highlight the potential influence of false or misleading information as it appeared over time. In many cases, we are unable to independently verify claims. Hence in reviewing this chronology, readers should take into account the credibility of the sources employed here.

Inclusion in this chronology does not necessarily indicate that a particular development is of direct or indirect proliferation significance. Some entries provide international or domestic context for technological development and national policymaking. Moreover, some entries may refer to developments with positive consequences for nonproliferation

2007-2000: NPO MASHINOSTROYENIYA

28 August 2007

NPO MASHINOSTROYENIYA TO FORM CORPORATION

NPO Mashinostroyeniya is set to form a vertically-integrated corporation, combining producers and designers of various supply and support elements. The new holding will absorb OAO Strela Production Association (PO Strela), OAO Permsky Zavod Mashinostroitel, OAO NPO Elektromekhaniki, OAO NII Elektromekhaniki, OAO Avangard, OAO Uralskiy NII Kompositsionnykh Materialov, and OAO Kontsern Granit-Elektron. While these entities have acted in coordination for some time, formation of the new corporation has yet to be finalized. The consolidation is expected to be completed in 2007.

-"Voenno-promyshlennaya korporatsiya 'NPO Mashinostroyeniya' budet sformirovana v blizhaishiye mesyatsy," Federal Agency on Industry, 28 August 2007, http://rosprom.gov.ru; Mikhail Barabanov, "Voenno-Promyshlennaya

Korporatsiya 'Nauchno-proizvodstvennoye obyedineniye mashinostroyeniya,'" *Eksport Vooruzheniy*, June/July 2007, www.cast.ru

28 December 2006

U.S. STATE DEPT. SANCTIONS RUSSIAN ENTITIES FOR IRAN AND SYRIA NONPROLIFERATION ACT VIOLATIONS

On 22 December 2006, the United States government determined that 24 actors including the Kolomna Design Bureau of Machine Building have engaged in activities warranting measures pursuant to Section 3 of the Iran and Syria Nonproliferation Act (ISNA). Other Russian entities included Rosoboroneksport and Tula Design Bureau of Instrument Building (Tula KBP). The Act provides for measures against entities engaging in transfer to, or acquisition from, Iran or Syria of any technology or materials controlled by international export agreements, or "otherwise having the potential to make a material contribution to the development of weapons of mass destruction or cruise or ballistic missile systems." Sanctions levied against KBM may have been triggered by a 2005 sale of Strelets surface-to-air missiles systems to Syria.

-"Bureau of International Security and Nonproliferation; Imposition of Nonproliferation Measures against Foreign Persons, Including a Ban on U.S. Government Procurement," Federal Register 27/3, January 5, 2007, www.gpoaccess.gov; Nikolai Sokov, "Russia Deplores U.S. Sanctions; Declares They Will Not Affect Arms Trade with Tehran," *WMD Insights*, March 2007, www.wmdinsights.com.

27 February 2004

MISMANAGEMENT ALLEGATIONS TARGET KHRUNICHEV

According to an investigative report published in *Versiya* on 27 February 2004, the M.V. Khrunichev State Space Scientific Production Center faces severe financial difficulties that place the organization on the verge of bankruptcy. The Khrunichev Center reportedly owes its employees more than 1 billion rubles ($35 million as of 27 February 2004) in back wages and has had problems settling bills with its suppliers. This precarious financial situation first and foremost can be attributed to a drop in revenue from commercial launches of Proton-K space launch vehicles (SLVs), the largest source of income for the center. Commercial launches brought in approximately $500 million in 1997, but that amount fell to $150 million in 2001. The article states, however, that there are other reasons underlying the financial crisis at the enterprise. In particular, the author, citing a report produced by the Ministry of Property Relations and the Ministry of Internal Affairs, claims that senior management at Khrunichev is engaged in expropriation of government property (*otchuzhdeniye federalnogo imushchestva*) for personal gain. The allegations focus on a series of transactions that occurred in March 2002, as the center prepared to become a joint stock enterprise and thereby sought to clear its balance sheet. According to the government report, Khrunichev entered into fictitious investment agreements with federal property broker JSC TNT (which only has one shareholder, a manager in the Khrunichev Property Department), as a result of which several properties owned by the center passed into the hands of private investors at a significantly undervalued price. Another company, Linston LLC, allegedly provided fraudulent estimates that at times amounted to five times less than the actual property value, which would allow the properties to be resold for a considerable profit. The article further alleges that the onset of these deals coincided with the hiring of Aleksey Dobrovolskiy, reportedly a colonel in the Federal Security Service, to head the Property Department at Khrunichev. Based on the findings of the government inspection, a branch of the Moscow Prosecutor's Office has opened a criminal investigation into illegal

expropriation of government property. It remains unclear, however, the extent to which these transactions, if confirmed, impacted the financial viability of Khrunichev.
-Anastasiya Korochkina, "Raketonositeli i imushchestvovynositeli," *Versiya* online edition, http://versiasovsek.ru, No.7, 27 February 2004.

24 January 2002
PUTIN CREATES TACTICAL MISSILE WEAPONS CORPORATION
On 24 January 2002, President Putin signed a decree establishing the Tactical Missile Weapons Corporation. At the present moment, the most important member of the corporation is the Zvezda-Strela State Scientific Production Center. Other firms in the corporation include Avtomatika plant, Detal design bureau, the Iskra Machine-Building Design Bureau, Krasnyy Gidropress plant and the Soyuz Machine-Building Design Bureau. Zvezda-Strela was founded 60 years ago and specializes in the development and production of precision-guided tactical air-launched missiles.
"Polet 'Zvezdy-Strely': Ukazom prezidenta Rossiyskoy Federatsii sozdana 'Korporatsiya' Takticheskoye raketnoye vooruzheniye," *Nezavisimoye voyennoye obozreniye*, http://nvo.ng.ru, 1 February 2002; Agentstvo voyennykh novostey, 20 June 2001; "Russia Ready to Establish Tactical Weapons Corporation," FBIS Document CEP20010620000213.

19 December 2001
ANTI-SHIP MISSILE CONSORTIUM FORMED
ITAR-TASS reported on 19 December 2001 that an agreement was signed at NPO Mashinostroyeniya in Reutovo, Moscow Oblast, to form a consortium of seven design bureaus and manufacturers. The stated goal of the consortium is to implement programs to develop and market anti-ship cruise missile systems for export. The consortium is led by NPO Mashinostroyeniya and includes PO Strela, TsNII Granit, PO Avangard, Mashinostroitel Plant, OKB Vympel, and NPO Elektromekhanika. The consortium will allow the design bureaus to market their products independently under presidential authorization for the next six years. The creation of the consortium is an apparent move by NPO Mashinostroyeniya to maintain control of its export market independent of Rosoboroneksport. The action is seen by some as an attempt to prevent the Russian government from restructuring the missile industry or from putting organizations under holding companies.
-Dayma Timergaliyeva, ITAR-TASS, 19 December 2001; in "Russian consortium to build new missile systems," FBIS Document CEP20011219000106; David Isby, "Russia forms anti-ship missile consortium," *Jane's Rockets and Missiles*, February 2002, p. 12.

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2007-2000: KBM

29 May 2007
RUSSIA TEST-FIRES NEW R-500 CRUISE MISSILE
On 29 May 2007, Russia test-fired its new KBM-designed R-500 (Iskander-K) cruise missile from the mobile

Iskander platform. While previously existing Iskander systems were armed with ballistic missiles, the Iskander transporter erector launcher can also be used for the R-500. During the test, the missile flew at an altitude of 100 meters, and at a speed of approximately 250 meters per second, completing several maneuvers before reaching the target area. Deviation from course trajectory is reported to have been less than 30 meters.
-Nikolai Sokov, "Russia Tests a New Ground-Launched Cruise Missile and a New Strategic Missile on the Same Day," CNS Research Story, 1 June 2007, http://cns.miis.edu.

28 December 2006

U.S. STATE DEPT. SANCTIONS KBM FOR IRAN AND SYRIA NONPROLIFERATION ACT VIOLATIONS

The United States government determined that 24 actors including the Kolomna Design Bureau of Machine Building have engaged in activities warranting measures pursuant to Section 3 of the Iran and Syria Nonproliferation Act (ISNA). The Act provides for measures against entities engaging in transfer to, or acquisition from, Iran or Syria of any technology or materials controlled by international export agreements, or "otherwise having the potential to make a material contribution to the development of weapons of mass destruction or cruise or ballistic missile systems." Sanctions levied against KBM may have been triggered by a 2005 sale of Strelets surface-to-air missiles systems to Syria.
-"Bureau of International Security and Nonproliferation; Imposition of Nonproliferation Measures Against Foreign Persons, Including a Ban on U.S. Government Procurement," Federal Register 27/3, January 5, 2007, www.gpoaccess.gov; Nikolai Sokov, "Russia Deplores U.S. Sanctions; Declares They Will Not Affect Arms Trade with Tehran," *WMD Insights*, March 2007, www.wmdinsights.com.

23 August 2006

SYRIA RECEIVES FIRST SHIPMENT OF STRELETS AIR DEFENSE SYSTEM

On 23 August 2006, *Jane's Defence Weekly* reported that Russia had begun deliveries of KBM-designed and manufactured Strelets mobile short-range anti-aircraft systems (Igla-S MANPADS in a vehicle-mounted configuration) to Syria. While Damascus initially intended to purchase SA-18 Igla-S MANPADS, Moscow halted the sale of the shoulder-fired systems amid concerns of their potential retransfer to Hezbollah, agreeing to supply Syria with the vehicle-mounted Strelets systems in 2005 instead.
-Christopher Foss, "Syria receives first Strelets SAMs," *Jane's Defence Weekly*, 23 August 2006; Jane's online, www.janes.com; Keri Smith, "Rosoboronexport denies claims of Strelets deal with Syria," *Jane's Defence Industry,* 1 March 2007; Jane's online, www.janes.com.

8 September 2004

RUSSIAN ARMY TO PROCURE ISKANDER-E AFTER STATE TRIALS

On 8 September 2004, *Jane's Defence Weekly* reported that the Russian Army was set to begin procurement of the Iskander-E tactical ballistic missile system in 2005 to form a missile brigade. The decision was made upon successful completion of state trials, during which the missile was launched 13 times in flat and ballistic trajectories. Russia's Defence Minister Sergey Ivanov had announced that some the necessary funding was already allocated under the 2004 National Defence Order. *Jane's Missiles and Rockets* also reported on 1 May 2004 that the KBM-designed Iskander-E, repeatedly prevented by funding shortfalls from entering into service in 2001, would soon enter serial production in 2004 at the Votkinsk Machine Building Plant.

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.

-Nikolai Novichkov, "Iskander Passes State Trials," *Jane's Defence Weekly*, September 8, 2004; David Isby, "Iskander-E production to start in 2004," *Jane's Missiles and Rockets,* May 1, 2004; Jane's online, www.janes.com.

1 April 2003

KBM ANNOUNCES SERIAL PRODUCTION OF IGLA-S MANPADS

According to an 1 April 2003 issue of *Jane's Missiles and Rockets,* during the year 2003 KBM planned to produce and export 530 Igla-S man-portable air-defense systems (MANPADS) to India, Malaysia, and potentially North Korea. The Russian armed forces reportedly accepted the system in July of 2002 after state trials were completed.

-David Isby, "Igla-S to enter production," *Jane's Missiles and Rockets*, April 1, 2003; Jane's online, www.janes.com.

30 January 2002

UNITED STATES INTERESTED IN ARENA SYSTEM

Agentstvo voyennykh novostey reported on 30 January 2002 that, according to KBM representatives, US firms have been involved in negotiations with KBM on the possible sale of Arena tank anti-missile defense systems. KBM First Deputy General Designer Valeriy Kashin said that while the US firms wish to purchase only two or three systems, KBM insists on selling no fewer than 100. KBM halted talks with US firm General Dynamics in the fall of 2001 due to an apparent inability to overcome differences. According to KBM, the Arena system has also attracted the interest of France, Germany, Turkey, and South Korea.

-"Konstruktorskoye byuro mashinostroyeniya prodolzhayet peregovory c amerikanskoy storonoy po kompleksu aktivnoy zashchity Arena," Agentstvo voyennykh novostey, 30 January 2002; in Universal Database of Military & Security Periodicals, http://online.eastview.com.

25 January 2002

ISKANDER TESTS TO BE FINISHED IN 2002

According to an article in the 25 January 2002 issue of *Nezavisimoye voyennoye obozreniye*, state acceptance tests of the Iskander are to be completed by the end of 2002. As of January 2002, the missile had successfully completed 40% of its required tests.

-[Igor Korotchenko, "Perspektiva. Ot 'Igly' do 'Iskandera'," *Nezavisimoe voyennoye obozreniye*, 25 January 2002; in Universal Database of Russian Military & Security Periodicals, http://online.eastview.com.

16 October 2001

KHRIZANTEMA TESTS NEAR COMPLETION

Agentstvo voyennykh novostey reported on 16 October 2001 that the state acceptance tests of the Khrizantema anti-tank missile would be completed "in a few months." According to the KBM First Deputy General Designer Valeriy Kashin, the tests were proceeding according to schedule.

-"Ispytaniya raketnoro kompleksa 'Khrizantema-S' zavershatsya cherez neskolko mesyatsev," Agentstvo voyennykh novostey, 16 October 2001; in Universal Database of Military & Security Periodicals, http://online.eastview.com.

3 October 2001

IRANIAN VISIT TO KBM

Agentstvo voyennykh novostey reported that on 3 October 2001 representatives of the Iranian Ministry of

Defense, headed by a deputy defense minister, visited KBM. The visit was part of a larger Iranian delegation, headed by Defense Minister Ali Shamkhani, which conducted talks in Moscow on military-technical cooperation. Iranian visitors were acquainted with KBM products that were cleared for export and were treated to a live-fire demonstration. During the visit KBM Director Nikolay Gushchin and Deputy Director for Foreign Economic Activities Valeriy Lomako were in Moscow, possibly engaged in the talks with the Iranian delegation.
-"Predstaviteli minoborony Irana posetili poligon KB mashinostroyeniya v Kolomne," Agentstvo voyennykh novostey, 10 March 2001; in Universal Database of Russian Military & Security Periodicals, http://online.eastview.com.

24 May 2001

SYRIA SEEKS ISKANDER

On 24 May 2001 Deputy Prime Minister Ilya Klebanov met with the Syrian Defense Minister, Marshal Mustafa Talas, to discuss military-technical cooperation between the two countries. During the talks Talas requested Russian assistance in modernizing a number of weapon systems of Soviet manufacture in Syrian service, and the sale of several modern weapon systems, including KBM's Iskander tactical ballistic missile.
-*Kommersant*, 25 May 2001; "Russia to Meet Syrian Requirements in Defense Weapons," Checkpoint Web Site, www.checkpoint-online.ch, 16 June 2001.

14 April 2001

ROSOBORONEKSPORT, KBM SIGN AGREEMENT

Krasnaya zvezda reported on 14 April 2001 that KBM and the state arms export company Rosoboroneksport had signed a general agreement in Kolomna concerning cooperation between the two entities on promoting arms export. KBM and Rosoboroneksport are to cooperate on identifying potential markets, seek out foreign customers, conduct marketing, and exchange information. The collaboration is also to extend into the area of contract preparation and implementation. The general director ofthe Novyye programmy i kontseptsii holding company, Boris Kuzyk, whose companies collaborate with KBM, praised the agreement as promising to increase orders both for KBM and for the firms of Kuzyk's holding company.
-Andrei Garavskiy, "Aktualno. Spetseksportery obyedinyayut usiliya," *Krasnaya zvezda*, 14 April 2001; in Universal Database of Russian Military & Security Periodicals, http://online.eastview.com.

15 February 2001

INDIA BUYS IGLAS

Vremya novostey reported on 15 February 2001 that KBM had signed a contract to deliver Igla man-portable anti-aircraft missiles to India. The contract, which was signed in November 2000, but the existence of which was not made public until recently, was reported to be worth $50 million.
-Olga Antonova, "'Igla' dlya Deli," *Vremya novostey* online edition, www.vremya.ru, 15 February 2001.

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2007-2000: MAKEYEV DESIGN BUREAU

19 January 2002

SLBM PRODUCTION TO RECEIVE PRIORITY

Nezavisimoye voyennoye obozreniye reported on 19 January 2002 that the First Deputy Chief of the General Staff, Colonel General Yuriy Baluyevskiy, announced that the naval component of the Russian nuclear triad would receive modernization priority, over the previously favored Strategic Rocket Forces. This announcement may signal an increase in the state orders placed with Makeyev.

-Sergey Sokut, "Russia is Changing Its Concept of Constructing Nuclear Forces," *Nezavisimoye voyennoye obozreniye*, 19 January 2002; in "Report on Radical Change in Priority in Triad of Strategic Nuclear Forces in Favor of Navy," FBIS Document CEP20020118000353.

30 November 2001

EUROPEAN ORGANIZATIONS INTERESTED IN MAKEYEV'S ROCKETS

Aviaport.ru reported on 30 November 2001 that a group of European Space Agency (ESA) and European Aeronautic Defence and Space Company (EADS) specialists visited Makeyev to discuss the possibility of joint projects and using the Volna SLV to launch experimental satellites developed by ESA.

-AviaPort.Ru, 30 November 2001.

20 July 2001

VOLNA SLV LAUNCHES SOLAR WIND TEST VEHICLE

On 20 July 2001, the Russian Kalmar-class [NATO designation 'Delta III'] ballistic missile submarine *Borisoglebsk* launched a Volna SLV designed by Makeyev. The launch took place in the Barents Sea, and the SLV carried the Solar Sail experimental satellite designed to investigate the possibility of using solar wind as a means of propulsion. The satellite was designed and manufactured by the Babakin Research Center, a division of the Lavochkin Production Association, and partially funded by the US-based Planetary Society. This was the fourth Volna SLV launch.

-ORT 1 Television Broadcast, 20 July 2001; in "Russian launches experimental solar-sail spacecraft," FBIS Document CEP20010720000255. Interfax, 20 July 2001; in "Russian launches spacecraft to test solar-wind-propelled vehicle," FBIS Document CEP20010720000032. "Kosmicheskiy parus raskrylsya," Topnew.ru, 20 July 2001.

19 June 2001

SINEVA TO ARM DELTA IV-CLASS

According to a 28 June 2001 *Izvestiya* article, in addition to pursuing the development of the Bulava SLBM, which is to arm the new Borey-class [NATO name 'Delta IV'] SSBNs and replace R-39 [NATO designation SS-N-20 'Sturgeon'] SLBMs on the remaining Akula ['Typhoon']-class SSBNs, Russia also plans to deploy a new variant of the R-29RM [NATO designation SS-N-23 'Skiff'], called the Sineva. The new variant carries 10 warheads and is being developed at the Makeyev State Missile Center in Miass, which proposed this missile as an alternative to the Bulava and the

failed Bark. The *Izvestiya* article also stated that while the Bulava's characteristics are still unknown, it is to be a single-warhead missile, despite the fact that MIRVed SLBMs are not prohibited by any existing arms control treaty.
-Yevgeniy Krutikov, "Provodit li Rossiya taynyye ispytaniya yadernogo oruzhiya," *Izvestiya*, 19 June 2001, p. 1; in WPS Oborona i Bezopasnost, 20 June 2001; in Integrum Techno, www.integrum.ru.

9 April 2001

NEW SATELLITE DEVELOPED

Computerra reported on 9 April 2001 that Makeyev developed the Kompas earthquake prediction satellite in cooperation with the Institute of Earth Magnetism, Ionosphere, and Radio Wave Propagation of the Russian Academy of Sciences. The first launch of a Kompas satellite is planned for later in the year. Makeyev specialists reportedly view the development of the satellite as the first step in a new direction of defense conversion efforts at Makeyev, and also as a possible ticket to enter the small satellite market.
-Ruslan Nasypov, "Novyy sputnik or uralskikh raketchikov," http://region.computerra.ru, 9 April 2001.

17 March 2001

ROSAVIAKOSMOS TO SIGN CONTRACTS WITH MAKEYEV

Russian Aerospace Agency (Rosaviakosmos) General Director Yuriy Koptev announced on 17 March 2001 that his agency was about to sign a number of contracts with enterprises located in Chelyabinsk Oblast, including Makeyev. Rosaviakosmos contracts with Makeyev reportedly will entail research and development work on missile and satellite control systems and experimental launches of new satellites.
-Ruslan Nasypov, "Rossiyskiye kosmicheskiye tekhnologii kuyutsya na Urale," http://region.computerra.ru, 28 March 2001.

16 March 2001

GOVERNMENT DELEGATION VISITS MAKEYEV CENTER

Aviaport.ru reported on 16 March 2001 that a government delegation headed by Deputy Prime Minister Ilya Klebanov, Navy Commander in Chief Admiral Kuroyedov, and other government officials visited Makeyev to discuss the possibility of restarting SLBM production. After the visit the Russian government promised to increase the state orders for 2001 for the Makeyev center by $290 million. The center's leadership voiced hope that the increased orders will enable it to increase the average salary to 3,500 rubles and provide its most highly qualified workers with housing grants.
-German Galkin & Dmitriy Zobkov, "Vice Premier Klebanov Saving Missile Makers. Minister Adamov Escaping From 'Greens'," *Kommersant*, 17 March 2001; in "Kommersant Views Klebanov Chelyabinsk Tour, Order for 40 ICBM's Likely 'Soon'," FBIS Document CEP20010319000186. Yuriy Golotyuk, "Tri 'golovy' khorosho, a desyat - luchshe," *Vremya novostey*, 16 March 2001, p. 3; in *WPS Oborona i bezopasnost*, 19 March 2001; in Integrum Techno, http://www.integrum.ru.

13 March 2001

MAKEYEV COMPLETES DESIGN OF YEDINSTVO SLV

Inspacemedia.com reported on 13 March 2001 that the Makeyev bureau announced it completed the design of the demonstration model of the Yedinstvo space launch vehicle (SLV). According to the bureau, the new SLV will

enter the development stage no earlier than 2002, after an agreement is reached on financing the project with potential investors. Foreign firms participants of the project include Boeing and Motorola. Yedinstvo was originally ordered by the Australian company ULSI to launch communications and ocean surveillance satellites from a future space launch facility in Australia.
-"GRTs razrabotal raketonositel dlya zapuska na orbitu kommercheskikh sputnikov," What's New Web Site, www.wn.ru, 13 March 2001.

12 March 2001
AUSTRALIAN COOPERATION PROJECT IN JEOPARDY
Kommersant reported on 12 March 2001 Makeyev's cooperation with the Australian firm United Launch Services International (ULSI) on developing the Yedinstvo SLV and a space launch facility on Hammock Hill Island (off the coast of Australia) is in jeopardy. ULSI has been unable to attract investors willing to provide the necessary $500 million for the project.
-Ivan Safronov, "Russia Will Send 'Avrora' to Australia -- For Commerce," *Kommersant*, 12 March 2001; in "Russia's Plans to Develop Space Industry Ties with Australia Viewed," FBIS Document CEP20010312000127.

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2007-2000: MITT

11 March 2002
IRREGULARITIES IN TOPOL-M FINANCING ALLEGED

12 February 2002
MONORAIL CAR PRODUCTION BEGINS
Moskovskaya pravda reported on 12 February 2002 that MITT had begun to produce cars for the Moscow monorail line. Monorail construction began in August 2001; the line will be 8.5km long and connect the Timiryazevskaya and Botanicheskiy sad subway stations.
-Nikita Perepelkin, "Poyekhali! Deshevo, no ne serdito," *Moskovskaya pravda*, 12 February 2002; Universal Database of Central Russian Newspapers, http://online.eastview.com.

7 February 2002
SOLOMONOV COMPLAINS ABOUT TOPOL-M FUNDING
During a meeting between Duma deputies and representatives of Russia's defense industry, MITT General Director Yuriy Solomonov complained that in 2001 Topol-M production received only 18% of planned funding, and further research and development of the missile only 2%.
-Vladimir Kucherenko, Aleksey Chichkin, "What Money Are We to Use to Make New Missiles?," *Rossiyskaya gazeta*, 19 February 2002, p. 3; in "More on Russian Duma Request on Defense Underfunding," FBIS Document CEP20020219000150.

2 February 2002

SOLOMONOV MEETS ROSSEL

MITT General Director Yuriy Solomonov met with Sverdlovsk Oblast Governor Eduard Rossel on 2 February 2002 to discuss MITT's ties with Urals-based subcontractors. The general director of one such subcontractor, NPO Avtomatika's Leonid Shalimov, participated in the meeting. Solomonov also discussed with Rossel MITT's civilian production and political issues concerning the Yedinaya Rossiya party (Solomonov is a member of its High Council).

-"Eduard Rossel prinyal generalnogo konstruktora gosudarstvennogo predpriyatiya 'Moskovskiy institut teplotekhniki'," RegionInform Web Site, www.urfo.ru, 4 February 2002.

13 May 2001

LUZHKOV PRAISES MITT ON ITS 55TH ANNIVERSARY

Moscow mayor Yuriy Luzhkov took part in a ceremony marking the 55th anniversary of MITT's creation, and praised its efforts to guarantee Russia's national security. Luzhkov also noted the importance of MITT's civilian production, and promised that the Moscow city authorities will continue to support the institute.

-"Na prazdnovanii 55-letnego yubileya Moskovskogo instituta teplotekhniki," RIA Novosti, 15 May 2001; Delovaya Pressa Web Site, www.businesspress.ru.

24 February 2001

MONORAIL BUILT AT MITT

Novyye izvestiya reported on 24 February 2002 that MITT had constructed an experimental monorail transit system on its territory. A monorail is expected to be built in Moscow.

-"Tramvay, kotoryy nikomu ne meshayet," *Novyye izvestiya*, 24 February 2001; in Universal Database of Central Russian Newspapers, http://online.eastview.com.

7 March 2000

SRF COMMANDER VISITS MITT

On 7 March 2000, SRF Commander General Vladimir Yakovlev met with MITT General Director Yuriy Solomonov to discuss issues concerning deployment of Topol-M ICBMs. The two officials discussed future cooperation between MITT and the SRF on ensuring the missile's reliable service and on converting missile silos to suit the new weapon.

-"Glavkom RVSN general-polkovnik Vladimir Yakovlev vstretilsya s rukovodstvom firmy, razrabotavshey raketnyy kompleks 'Topol'-M," Agentstvo voyennykh novostey, 7 March 2000; in Universal Database of Russian Military and Security Periodicals, http://online.eastview.com.

7 February 2000

FEDERAL TAX POLICE PURSUE MITT DEBTS

Delovaya Moskva reported on 7 February 2000 that in 1999 the Federal Tax Police initiated legal proceedings against a number of Moscow-based businesses which were delinquent in their payments to the Russian Federation's pension fund. MITT was identified as one such enterprise, and its debt was reported at 14.6 million rubles (approximately $500,000).

-"Statistika," *Delovaya Moskva*, 7 February 2002; in Delovaya Pressa Web Site, www.businesspress.ru.

Related content is available on the website for the Nuclear Threat Initiative, www.nti.org.

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2007-2000: ZLATOUST MACHINE-BUILDING PLANT

18 November 2001

ZLATOUST PLANT TO LOSE POWER

RosBiznesKonsalting reported on 18 November 2001 that the regional utility firm Chelyabenergo had warned regional authorities that it planned to cut off all electricity supplies to the Zlatoust plant on 19 November 2001. Chelyabenergo explained that this measure was due to Zlatoust's inability to pay for electricity and its 217 million rubles ($7.29 million as of 18 November 2001) of electricity debt, which is the largest of any enterprise in the oblast.

-"Zavodu, proizvodyashchemu ballisticheskiye rakety, otklyuchat elektrichestvo," RosBiznesKonsalting Web Site, http://top.rbc.ru, 18 November 2001.

21 April 2000

ZLATOUST PLANT LOSES POWER

Aviaport.ru reported on 21 April 2000 that the regional utility monopoly Chelyabenergo had completely stopped supplying the Zlatoust plant with electricity. In addition to the plant, 70% of the city of Zlatoust was deprived of electricity. There were also interruptions in the water supply. Chelyabenergo resorted to this drastic measure after its inspectors were not allowed to enter the plant in order to carry out a partial electricity shut-off. Zlatoust Mayor Vasiliy Maltsev said that while the Zlatoust plant has been recently paying for electricity regularly, it owes 300 million rubles ($10.49 million as of 21 April 2000) because the Russian government has failed to pay for its defense orders. Chelyabinsk Oblast Governor Petr Sumin was outraged by the shut-offs and ordered his deputies to resolve the situation.

-"AO 'Chelyabenergo' otklyuchil ot elektrichestva Zlatoustovskiy mashinostroitelnyy zavod," Aviaport Web Site, www.aviaport.ru, 21 April 2000.

10 April 2000

ZLATOUST PLANT MAY BECOME PART OF JOINT VENTURE

Traktor.ru reported on 10 April 2000 that the Chelyabinsk Oblast government had identified the Zlatoust Machine-Building Plant and two other Chelyabinsk Oblast factories (Miass Machine-Building Plant and the Kyshtym Radio Manufacturing Plant) as potential members of a joint-venture company for defense products. Under this concept, whose authorship is attributed to the Defense Minister, Marshal Igor Sergeyev, the regional administration would be involved in directing development and production and facilitate the placement of defense orders at the plants. According to Sergeyev, the Ministry of Defense would find it easier to ensure state orders to enterprises united in such regional joint ventures and producing finished products than to enterprises producing only subcomponents.

"Chelyabinskiye predpriyatiya VPK v 2000 godu nachnut formirovaniye regionalnoy kooperatsii po sozdaniyu voyennoy produktsii," Traktor.ru, 10 April 2000.

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2007-2000: KHRUNICHEV

9 May 2002

ILS USE OF PROTON SEEN AS DECLINING

Gazeta.Ru reported on 9 May 2002 that International Lauch Services (ILS) is gradually reducing its reliance on Khrunichev's Proton space launch vehicles (SLVs) and is instead increasing the number of launches using Lockheed Martin's Atlas family of SLVs. Although Khrunichev hoped to carry out 15 Proton launches in 2002, only two launches were conducted in the first four months of the year, and only two more launches were expected for the rest of the year. The owners of one satellite initially scheduled to be launched by a Proton have decided to use either the Ariane or Delta IV, while three other satellites will be launched by Atlas SLVs. Khrunichev's lost income is estimated at $340 million. Gazeta.Ru concluded that these developments may spell a bleak future for the Proton if ILS continues to favor Atlas rockets over Protons. Moreover, Gazeta.Ru pointed out that ILS has the exclusive rights for both the Proton and the new Angara booster, which precludes Khrunichev from seeking separate space launch contracts. (For more information, see the following entries 12/26/2001, 12/1/2000 and 8/12/2000.)

-Ivan Ivanov, "US betrayal leaves Russian rockets idle," Gazeta.Ru, 9 May 2002.

12 April 2002

PROTON-K LAUNCHES FROM BAYKONUR TO STOP

Kazakhstani television reported on 12 April 2002 that Russia has acceded to Kazakhstan's requests to stop launching Proton-K rockets from the Baykonur Cosmodrome because their fuel is highly toxic. On several occasions rocket fragments have fallen on residential areas in Kazakhstan, resulting in contamination. The Khrunichev Center has agreed to use only the new Proton-M and Angara SLVs, which use less toxic fuel components. However, neither of these rockets is yet fully operational.

-Kazakh Commercial TV, 12 April 2002; in "Russia agrees not to launch old Proton-K booster rockets from Kazakh space site," FBIS Document CEP20020412000184.

23 January 2002

PUTIN VISITS KHRUNICHEV

On 23 January 2002, Russian President Vladimir Putin, accompanied by Rosaviakosmos Director Yuriy Koptev, visited the Khrunichev Center for the first time in order to familiarize himself with its activities and discuss the future development of Russia's missile and space industry, and potential Russian responses to the US National Missile Defense (NMD) program. Khrunichev Director Aleksandr Medvedev briefed Putin on the progress being made on the new Angara SLV, the 12KRP booster unit developed at the center for use on the Indian Geosynchronous Space Launch Vehicle (GSLV), the Baykal reusable first stage, and the FGB-2 International Space Station (ISS) module. Putin reportedly discussed possible Russian responses to the NMD program, an area in which the Khrunichev center has some experience, having participated in the design of military space stations in the 1970s while part of the Central Design Bureau of Machine-Building (currently NPO Mashinostroyeniya.)

-Andrey Garavskiy, "The Space Council in the filyakh," *Krasnaya zvezda*, 23 January 2002; in "Garavskiy: discussion of current status of Khrunichev space production center in connection with Putin visit, and possible modernization of Russia's ABM System in response to U.S. development of NMD," FBIS Document CEP20020124000403.

29 December 2001

KHRUNICHEV SEEKS DIVERSIFICATION

According to an article in the 29 December 2001 issue of *Nezavisimaya gazeta*, Khrunichev is considering a number of ventures that would reduce its emphasis on SLV production. This is in part due to a slow-down in Khrunichev's SLV orders: in 2000 six of Khrunichev's Proton SLVs were launched, in 2001 that number was just two. Khrunichev is planning to design satellites and enter into cooperation with Venezuela. The latter project would involve production and launch of communications and remote sensing satellites for civilian use, joint production of medical equipment and light aircraft, and the construction of a launch site for light SLVs. However, talks on cooperation with Venezuela have been slow to progress. In spite of these initiatives, SLV production will remain Khrunichev's core business. Its current project is the Angara family of SLVs, which are reputed to use more environmentally-friendly fuel components than Proton SLVs.

-Dmitriy Yastrebov, "Russia Plans to Build Space Center in Venezuela. Creators of Russian Rocket Technology Do Not Want to Remain Mere 'Carriers'," *Nezavisimaya gazeta*, 29 December 2001, p. 6; in "Khrunichev Center Moving into Satellites, May Build Launch Site in Venezuela," FBIS Document CEP20020104000051

27 December 2001

INDIA ADOPTS KHRUNICHEV CRYOGENIC BOOSTER

Khrunichev General Director Aleksandr Medvedev announced on 27 December 2001 that the 12KRB cryogenic booster unit developed at the Khrunichev Center under an Indian contract has been adopted by India thanks to its first successful test flight as part of India's Geo-Synchronous Launch Vehicle (GSLV) program. Medvedev stated that it was a landmark event for India, which thus joined the limited number of states capable of launching satellites into geostationary orbits. According to Medvedev, India and Russia also agreed on further development of the booster. (For more information, see the following 4/9/2001 entry.)

-Agentstvo voyennykh novostey, 27 December 2001; in "Russian cryogenic booster adopted by India," FBIS Document CEP20011227000133.

26 December 2001

ILS LAUNCH PROSPECTS ASSESSED

Interfax reported on 26 December 2001 that one of the founders of International Launch Services (ILS), a US-Russian joint venture in which Khrunichev is a participant, announced that ILS had secured launch contracts worth about $3 billion through the end of 2004. It signed 12 commercial contracts worth $1 billion in 2001 alone. Five of of the 2001 contracts were for launches using Khrunichev's Proton SLV.

-Interfax, 26 December 2001; in "Russian-US joint space launch service has $3 billion-worth orders until 2004," in FBIS Document CEP20011226000060.

12 December 2001

POSSIBLE KHRUNICHEV COOPERATION WITH VENEZUELA

Interfax reported on 12 December 2001 that Venezuela had given its preliminary consent to join international missile nonproliferation regimes, a condition set by the Russian government for signing a bilateral agreement on space launches. The Khrunichev Center had received a proposal from Venezuela in November 2001 concerning the possibility of launching remote sensing and communications satellites during a visit by a Khrunichev delegation to

Venezuela. The two countries were expected to sign a preliminary agreement on 14 December 2001 during Prime Minister Mikhail Kasyanov's visit to Venezuela.
- "Venezuela agrees with non-proliferation regime," Interfax, 12 December 2001. "Russian space centre may cooperate with Venezuela on launching satellites," Interfax, 26 November 2001; in "Russian space centre may cooperate with Venezuela on launching satellites," FBIS Document CEP20011127000395.

17 October 2001

VNESHTORGBANK TO FINANCE KHRUNICHEV

ITAR-TASS reported on 17 October 2001 that Russia's Vneshtorgbank (Foreign Trade Bank) will provide credits to the Khrunichev Center to finance priority programs such as the Angara SLV, modernization of the Proton SLV, and the design and production of Earth remote sensing satellites. The amount of the loan was reported as $40 million. Vneshtorgbank Chairman Yuriy Ponomarev assured Khrunichev of favorable financing terms in the future.
-ITAR-TASS, 17 October 2001; in "Russia's Vneshtorgbank to finance Khrunichev space center," FBIS Document CEP20011017000266.

21 August 2001

KHRUNICHEV DISPLAYS LIGHT AIRCRAFT AT MAKS-2001

Space-Inform, with reference to ITAR-TASS, reported on 21 August 2001 that the Khrunichev Center displayed over 10 new aircraft at the MAKS-2001 aerospace exhibition. The center hopes to secure domestic and foreign contracts for their sale, according to Khrunichev's director of aviation programs, Maksim Glazkov. Reportedly, talks had already been held with US and South Korean representatives. Aircraft displayed included the T-411 Aist, T-433 amphibian, T-527 Fermer agricultural aircraft, and twin-engined T-440 Merkuriy light passenger plane. According to Glazkov, Khrunichev will continue to develop the aviation side of its business.
-"Tsentr Khrunicheva predstavil na MAKS-2001 novyye samolety," Space-Inform, www.space.com.ua, 21 August 2001.

5 August 2001

KIM JONG-IL VISITS KHRUNICHEV

On 5 August 2001, North Korean leader Kim Jong-Il visited the Khrunichev Center. He was accompanied during his visit by Deputy Prime Minister Ilya Klebanov and Rosaviakosmos head Yuriy Koptev. During the visit, Kim reportedly wanted to ascertain the cost of launching a North Korean satellite using one of Khrunichev's rockets. A Seoul-based diplomatic source cited in South Korea's *Yonhap* newspaper commented that Kim's visit to Khrunichev was of interest, since the facility assembled ICBMs during the Soviet era, and the West was concerned that Kim's delegation included missile experts. The source stated there were no indications North Korea would sign a contract for launching any satellites. However, according to ITAR-TASS, Kim's visit reflected the DPRK's growing interest in peaceful space exploration. Following Kim's visit, the Russian Foreign Ministry stated that Russia will strive to draw North Korea into international contacts in the belief that such contacts will encourage the DPRK leadership to abandon its WMD programs. The Russian Foreign Ministry also claimed that Kim Jong-Il saw in Khrunichev, which the ministry identified as an "exclusively civilian enterprise," an alternative to the DPRK's military programs.
-ITAR-TASS, 5 August 2001; in "Russia: North Korean leader visits Khrunichev Space Center," FBIS Document CEP20010805000019. Chu Yong-song, "Chairman Kim Inquires the Cost of Satellite Launch in Russia," *Yonhap*, 12

August 2001; in "ROK Article on DPRK Leader Reportedly Expressing Interest in Cost of Satellite Launch," FBIS Document KPP20010812000004. Gennadiy Sysoyev, "North Korea to Help Russia Reach Agreement with United States," *Kommersant*, 6 August 2001; in "Kommersant: Kim Missile Launch Promise 'Reinforces' Russian Stance on ABM Treaty," FBIS Document CEP20010806000038.

9 April 2001

KHRUNICHEV TO SUPPLY ROCKET BOOSTERS TO INDIA

Interfax reported on 9 April 2001 that the Khrunichev Center will supply five 12 KRB booster units for the Indian Geo-Synchronous Launch Vehicle (GSLV) program within the next two to three years. The cryogenic booster units use liquid hydrogen fuel and liquid oxygen as the oxidizer, and have been under development since 1982. The Isayev Design Bureau for Chemical Machine-Building in Korolev has also participated in the project. The launch of the GSLV-D1 rocket that was to serve as the first test space flight of the new booster was initially planned for 28 March 2001, but was moved to April due to problems with the first stage. India reportedly plans to conduct one to two launches of GSLV rockets per year using the Russian cryogenic booster unit.

-"Khrunichev Space Center to Supply Rocket Booster Units to India," Interfax, 9 April 2001.

9 April 2001

KHRUNICHEV SCIENTISTS CONTINUE WORK ON MIR-2

ITAR-TASS reported on 9 April 2001 that Khrunichev specialists were continuing work on a new orbital station with the preliminary name of Mir-2. Although the estimated time of the station's launch was given as several years, Khrunichev Director Aleksandr Medvedev said that its development was uncertain due to lack of funding. Moreover, the Russian specialists' main concern is work on International Space Station modules, reducing the amount of time they can spend on Mir-2.

-ITAR-TASS, 9 April 2001; in "Russia: Scientists working on Mir-2 space station project," FBIS Document CEP20010409000140.

7 February 2001

MEDVEDEV SUCCEEDS KISELEV AS KHRUNICHEV DIRECTOR GENERAL

On 7 February 2001, President Putin named Aleksandr Medvedev, age 48, to succeed Anatoliy Kiselev in the post of Khrunichev general director. Kiselev reportedly requested to be relieved of his position for health reasons and nominated his deputy, Medvedev, to succeed him. Medvedev was picked over the former Rosvooruzheniye arms export agency head, Aleksey Ogarev, who reportedly had the backing of the Yeltsin "family."

-Agence France Presse, 7 February 2001; in "Putin Names New Russian Space Centre Chief," FBIS Document EUP20010207000044. Sergey Leskov, "Rockets in a Fog," *Izvestiya*, 13 January 2001; in "Main Contenders for Top Russian Space Job Profiled," FBIS Document CEP20010116000258.

25 January 2001

KHRUNICHEV OUTLINES FUTURE PLANS

ITAR-TASS reported on 25 January 2001 that following the signature of the first contract with Intersputnik to use the Rokot SLV to launch two satellites in 2003, the Khrunichev Center announced it will rely on lightweight launch vehicles in the future. Although the Khrunichev Center claimed that using the Rokot (which is a converted UR-

100N-series ICBM, previously produced at the Khrunichev Plant, with an added stage) would enable it to evade US launch quotas for commercial satellite launches. However, since Proton quotas were cancelled in late 2000 (see the 12/1/2000 entry, below), the real reasons may be Kazakhstan's opposition to the launch of Protons from Baykonurand the desire to sign launch contracts without going through International Launch Services, which has exclusive rights to Proton launches. Nevertheless, Khrunichev does not plan to cease working on the Proton, although it claims the Proton's commercial competitiveness has been hampered by US launch quotas. Since the US government cancelled the Proton launch quotas in December 2000, only a small number of Proton launch contracts were secured for 2001. Khrunichev is also hoping to conduct the first launch of its new Angara SLV in 2003.
-ITAR-TASS, 25 January 2001; in "Russian space centre to rely on light boosters," FBIS Document CEP20010126000051.

8 December 2000

KHRUNICHEV CENTER TO BUILD LIGHT AIRCRAFT

Khrunichev Aviation Department Deputy Chief Designer Arnold Adrianov told the Military News Agency on 8 December 2000 that the Center will begin the construction of 15 T-411 Aist light aircraft in early 2001. The reported sale price of the new aircraft will be $130,000. Khrunichev also has plans to start production of agricultural aircraft and of the nine-passenger T-201 Sterkh aircraft. In addition, design of the T-440 Mercury executive passenger aircraft is reported to be in the final stages. The Khrunichev Center has invested over $10 million in its aviation branch.
-Agentstvo voyennykh novostey, 8 December 2000; in "Russian Khrunichev R&D Centre Invests in Aircraft Building," FBIS Document CEP20001209000109.

1 December 2000

PROTON LAUNCH QUOTAS TO END

The Wall Street Journal reported on 1 December 2000 that the US government would not renew launch quotas on Russian Proton rockets for 2001. US officials announced that this step was motivated by Russian progress in limiting ballistic missile technology proliferation to Iran. However, although US officials praised Rosaviakosmos for establishing strong control over Russian aerospace companies, individual Russian experts continued to sell their expertise to Iran. The Russian government and Khrunichev's International Launch Services (ILS) partner Lockheed Martin both lobbied to have the quotas cancelled, on the grounds that they undermined the commercial viability of ILS. The launch quotas were initially introduced in 1993 when the Clinton Administration permitted Russian firms to compete for the US space launch market and used promises of quota adjustments as a means of leverage to ensure Russian compliance with its nonproliferation obligations.
-Carla Anne Robbins, Anne Marie Squeo, "U.S. to End Quotas on Satellite Launches by Russia, Helping Lockheed's Business," *Wall Street Journal*, 1 December 2000, p. 4.

12 August 2000

CONCERNS OVER PROTON LAUNCH QUOTAS

Interfax reported on 12 August 2000 that the delay in issuing new launch quotas for commercial launches using Khrunichev's Proton boosters has caused concerns in Russia that such a delay might negatively impact the

Khrunichev Center. Rosaviakosmos press secretary Sergey Gorbunov said that of the earlier 20-launch Proton quota all but seven launches have been completed, and that both Rosaviakosmos, NASA, and Khrunichev's partner in the International Launch Services joint venture, Lockheed Martin, would like to see the launch quotas on Russian rockets removed completely. Rosaviakosmos also denied that Russia sold missile technologies to Iran and was concerned that such claims, which it regards as purely political, have hurt US-Russian relations in general and efforts to increase Proton quotas in particular.
-Interfax, 12 August 2000; in "Official: US Delaying Quotas for Foreign Satellite Launches by Russian Rockets," FBIS Document CEP20000812000056.

28 May 2000
PLESETSK LAUNCHES FIRST ROKOT CONVERSION SLV
Russian TV reported on 28 May 2000 that the Plesetsk space launch facility had conducted the first launch of the Rokot lightweight SLV, a converted UR-100N [NATO designation SS-19 'Stiletto'] ICBM. The rocket placed two dummy satellites in orbit. Strategic Rocket Forces Commander General Vladimir Yakovlev expressed hope that, if successful, the Rokot program will earn Russia several hundred million dollars by recycling the missiles into SLVs.
-RTR TV, 28 May 2000; in "RTV Military Program Shows First Rokot Launch," FBIS Document CEP20000601000257.

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2007-2000: STRELA PRODUCTION ASSOCIATION

24 December 2001
STRELA BECOMES PART OF ANTI-SHIP MISSILE CONSORTIUM
Pravda reported on 24 December 2001 that PO Strela had become part of a consortium for the development and marketing of anti-ship cruise missile systems. The consortium is headed by PO Strela's long-time partner NPO Mashinostroyeniya, and also includes Vympel Design Bureau, Granit Central Scientific Research Institute, the Mashinostroitel plant, Avangard Production Association, and Elektromekhanika Production Association. The consortium will develop and market anti-ship missiles based on NPO Mashinostroyeniya's Oniks/Yakhont missile.
-"Russia Establishes Consortium for Development and Promotion of Cruise-Missile Combat Systems to International Market," *Pravda* online edition, http://english.pravda.ru, 24 December 2001.

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2007-2000: AAK PROGRESS

11 October 2002
OVERDUE SALARIES PAID AT PROGRESS
Vostok-Media reported on 11 October 2002 that Progress had begun to pay out overdue salaries. According to the report, Progress workers had at last received salaries for the past two years. This was made possible due to a Chinese missile export order. The average salary at the plant remains just 3,000 rubles [$93 as of October 2002],

although it is to increase to 3,500 rubles [$108] by the end of October 2002.
-"Na aviatsionnoy kompanii 'Progress' nachalos pogasheniye zadolzhennosti po zarplate," Vostok-Mediya, 11 October 2002; in Integrum Techno, www.integrum.ru.

23 September 2002

PROGRESS BEGINS WORK ON CHINESE ORDER

Regions.ru reported on 23 September 2002 that Progress had started work on an export order for 3M-80 Moskit anti-ship cruise missiles [NATO designation SS-N-22 'Sunburn'] for two warships ordered by China in Russian shipyards. The order will enable Progress to fully employ half of its workers and fund preparations for production of unspecified new aviation-related products. According to the AAK Progress board of directors, the plant was ready to start working on the order in 2001, but could not do so until the fight over the placement of the ship order was resolved at the highest levels of the Russian government.
-"Primorskiy Kray. Aviakompania 'Progress' nachala vypolnyat kitayskiy voyennyy zakaz," Regions.Ru, 23 September 2002; in Integrum Techno, www.integrum.ru. "Arsenyevskaya aviakompaniya 'Progress' nachala vypolnyat kitayskiy zakaz na 'Moskity'," Vostok-Mediya, 23 September 2002; in Integrum Techno, www.integrum.ru.

8 August 2002

MIRONOV VISITS PROGRESS

On 8 August 2002, Federation Council Chairman Sergey Mironov, accompanied by Primorskiy kray Governor Sergey Darkin, visited the Progress plant. During the visit Mironov acquainted himself with the helicopters and missiles produced at the plant, and gave assurances that AAK Progress could count on further orders, including from the Russian government.
-Viktor Debelov, "Spiker Soveta Federatsii Sergey Mironov posetil arsenyevskuyu aviakompaniyu 'Progress'," *Vladivostok*, 8 August 2002; in Vsya Rossiya, 9 August 2002; in Integrum Techno, www.integrum.ru.

19 July 2002

PROGRESS DEFEATS COURT CHALLENGE

On 19 July 2002 Vostok-Media cited the newspaper *Vladivostok* as reporting that the Primorskiy kray arbitration court had ruled against a group of Progress creditors who had sought to have the plant declared bankrupt. During the proceedings, Progress' position was supported by the Primorskiy kray government, which opposed the suit. Primorskiy kray Governor Sergey Darkin cited the plant's importance to the economy of the city of Arsenyev and the region as a whole. He also noted that Progress had just begun to fulfill a major export contract, and would start receiving revenues from it by the end of 2003. *Vladivostok* believes that addition attempts to seize control of the suddenly profitable plant are likely. The suit was brought by Diorit-Kholding Closed Joint Stock Company, to which AAK Progress owed 100,000 rubles [$3,100 as of July 2002]. According to unconfirmed Russian media reports, the suit was inspired by the conflict between Rosoboroneksport and Progress over the former's share of contract profits. Allegedly, Presidential Representative Konstantin Pulikovskiy also called for a management change at Progress following an inspection in March 2002. However, Pulikovskiy's letters to Rosaviakosmos and Prime Minister Kasyanov questioning Pechenkin's ability to manage the plant were allegedly not well received. The court ruling in favor of Progress was reportedly the last obstacle the plant had to clear before receiving a second Chinese

missile contract.
-"Pervaya popytka obankrotit aviakompaniyu 'Progress' otbita," Vostok-Media, 19 July 2002; in Integrum Techno, www.integrum.ru. Tatyana Kurochkina, "Generalnyy direktor aviatsionnoy kompanii 'Progress' (Primorskiy Kray) Viktor Pechenkin rasskazal o polozhenii del na predpriyatii," *Zolotoy rog*, 6 August 2002; in Vsya Rossiya, 7 August 2002; in Integrum Techno, www.integrum.ru. Igor Nikitin, "Arsenyevskiy zavod 'Progress' (Primorskiy kray) preodolel posledniye prepony na puti k kontraktu s KNR na proizvodstvo raket 'Moskit'," *Zolotoy rog*, 30 July 2002; in Vsya Rossiya, 30 July 2002; in Integrum Techno, www.integrum.ru.

15 June 2002

PROGRESS TO DEVELOP OWN ENGINE FOR ANTI-SHIP MISSILE

Vostok-Media reported on 15 June 2002 that Progress is developing the capability to produce the propulsion system for the 3M-80 Moskit anti-ship missile. If Progress is successful in developing this capability, it will eliminate the need to buy these engines from subcontractors. In addition, during the company's shareholder meeting it was announced that further sales of these missiles, including a land-based variant, may be expected in the near future.
-"U aviakompanii 'Progress' est perspektiva postavit 'Moskity' na potok," Vostok-Media, 15 June 2002; in Integrum Techno, www.integrum.ru.

9 April 2002

PROGRESS FOUND SUITABLE FOR DEFENSE ORDERS

The Russian information agency Oreanda reported on 9 April 2002 that a governmental commission headed by Chief Federal Inspector for Primorskiy kray Sergey Sherstyuk found AAK Progress capable of undertaking the production of missiles for China, and of fulfilling state defense orders. The inspection was conducted at the behest of Presidential Representative to the Far Eastern Federal District Konstantin Pulikovskiy. Although the inspection found Arsenyev to have a high level of unemployment and low average salary, it also concluded the city had considerable technological potential and deserved governmental support.
-*Vladivostok*; in "Politicheskiy press-obzor," RIA Oreanda, 9 April 2002; in Integrum Techno, www.integrum.ru.

28 March 2002

PULIKOVSKIY'S REPRESENTATIVES INSPECT PROGRESS

Regions.ru reported on 28 March 2002 that AAK Progress was visited by a commission appointed by Presidential Representative to the Far Eastern Federal District Konstantin Pulikovskiy and headed by the Chief Federal Inspector for Primorskiy kray, Sergey Sherstyuk. The commission included representatives of Rosvooruzheniye. The purpose of the visit was to ascertain the plant's production capabilities and prepare it for a large state defense order. In spite of the revenues from export production, the situation at the plant remains uncertain. Several hundred Progress specialists are on furlough due to lack of work. According to Sherstyuk, aresumption of state orders at Progress would not only revitalize the plant, but also improve the social situation in Arsenyev and increase tax revenues.
-"Primorskiy Kray. Komissiya dalnevostochnogo polpreda pristupila k inspektsii Arsenyevskoy aviastroitelnoy kompanii," Regions.Ru, 28 March 2002; in Integrum Techno, www.integrum.ru.

27 June 2000

PROGRESS TO REDUCE RELIANCE ON SUBCONTRACTORS

The newspaper *Vladivostok* reported on 27 June 2000 that Progress is seeking to reduce production costs by manufacturing more component parts for its products at its own facility, and by establishing partnerships with industries in Primorskiy kray. Doing so would decrease Progress's dependence on traditional suppliers, which charge relatively high prices. Components that may be produced at Progress include the ramjet engine for the 3M80 Moskit anti-ship cruise missile.

-Viktor Debelov, "'Moskity' - iz svoikh detaley," *Vladivostok*, 27 June 2000; in Integrum Techno, www.integrum.ru.

15 May 2000

MISSILES SHIPPED TO CHINA

Progress General Director Viktor Pechenkin announced on 15 May 2000 that a large batch of 3M-80 Moskit anti-ship missiles had been sent to China. The batch consisted of 24 missiles, and a second batch of 24 missiles is to be shipped by the end of 2000.

-"Krupnaya partiya krylatykh raket otpravlena v Kitay s primorskogo oboronnogo predpriyatiya 'Progress'," *Izvestiya*, 16 May 2000; CRY.ru, 16 May 2000; in Integrum Techno, www.integrum.ru. *Izvestiya*; in "Ekonomicheskiy press-obzor," RIA Oreanda, 17 May 2000; in Integrum Techno, www.integrum.ru.

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2007-2000: DMZ

1 December 2002

DMZ TO UPGRADE KH-55 CRUISE MISSILE

According to a 1 December 2002 report in *Jane's Defence Upgrades*, DMZ will undertake the repair and upgrade of the Kh-55 [NATO designation AS-15 'Kent'] cruise missile. The upgraded missile, to be called the Kh-555, will incorporate the homing system currently employed in the Kh-101 air-launched cruise missile (ALCM) produced by MKB Raduga and will be equipped with conventional rather than nuclear warheads.

-Piotr Butowski, "Russia plans bomber fleet modernisation," *Jane's Defence Upgrades*, 1 December 2002, http://jdu.janes.com.

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2007-2000: NOVATOR

3 September 2001

INDIA RECEIVES CLUB-ARMED SUBMARINE

Novyye izvestiya reported that on 3 September 2001 Admiralteyskiye verfi shipyard turned over to the Indian Navy its first Project 877-EKM [NATO name 'Kilo'] diesel-electric submarine modernized by the addition of the Club missile system. The second similarly modernized submarine was to be ready for transfer in late September or early

October 2001. Similar modernization work is also being conducted in Severodvinsk shipyards. India has purchased a total of 10 Kilo-class submarines from Russia. The last ship to be delivered, INS *Sindhushastra*, received the Club system as part of its original weapons fit (see the 11/18/2000 entry in the Missile Exports to India file).
-Aleksey Tikhonov, "Indiya uydet ot nas s 'Mechom'," *Novyye izvestiya*, 26 September 2001, p. 4; in East View Universal Database of Central Russian Newspapers, http://online.eastview.com.

29 August 2001

NOVATOR MAY BECOME PART OF AIR DEFENSE CONCERN

Kommersant-daily reported on 29 August 2001 that the Russian Control Systems Agency (RCSA) included the Novator Design Bureau in the list of enterprises to be included in the Kontsern PVO enterprise ordered created by President Putin. The new enterprise would unite Russia's leading air defense system design bureaus and manufacturers. However, RCSA reportedly included Novator in the proposed merger without coordinating this move with the Russian Aerospace Agency, to which Novator is subordinate, and whose assent would be needed.
-Ivan Safronov, "Klebanov sdelayet zakhod k prezidentu," *Kommersant-daily*, 29 August 2001, p. 2; in East View Universal Database of Central Russian Newspapers Database, http://online.eastview.com.

1 August 2001

NOVATOR, ROSOBORONEKSPORT SIGN AGREEMENT

Representatives of Novator Design Bureau and the state arms export firm Rosoboroneksport signed an agreement on 1 August 2001 on marketing Novator's products on foreign markets. The agreement was signed during Rosoboroneksport General Director Andrey Belyaninov's working visit to Sverdlovsk Oblast. At a meeting organized by Oblast Governor Eduard Rossel, representatives of Sverdlovsk's defense enterprises expressed dissatisfaction with Rosoboroneksport's activities, particularly the amount of time required to issue licenses and permits. Rossel asked Rosoboroneksport to give its Yekaterinburg branch and local defense enterprises greater independence.
-Viktor Smirnov, "Ural nedovolen rabotoy 'Rosoboroneksporta'," *Kommersant-daily*, 2 August 2001; in East View Universal Database of Central Russian Newspapers, http://online.eastview.com.

18 November 2000

FIRST CRUISE MISSILE-ARMED INDIAN SUBMARINE ARRIVES IN INDIA'S WATERS

9 August 2000

CHINA NEGOTIATING PURCHASE OF 3M54E

Jane's Defence Weekly reported on 9 August 2000 that the People's Republic of China is interested in purchasing a variant of the 3M54E anti-ship missile (part of the Club missile family). OKB Novator reportedly supplied technical information on the system to China at the request of the state arms export firm Rosvooruzheniye. The Rubin Central Design Bureau for Marine Engineering, which designed the Kilo-class submarines, informed *Jane's Defence Weekly* that it has been promoting the idea of upgrading two submarines already supplied to China with the Club system.
-Yihong Zhang, "China negotiates to buy advanced Russian anti-ship missile," *Jane's Defence Weekly*, 9 August 2000; in Lexis-Nexis Academic Universe, www.lexis-nexis.com.

24 March 2000

SERGEYEV PROMISES FINANCING FOR NEW SLCM

According to the 24 March 2000 issue of the *Nezavisimoye voyennoye obozreniye*, during a visit to Yekaterinburg Russian Defense Minister Marshal Igor Sergeyev announced that the Ministry of Defense will finance the development of a new multi-role missile system incorporating a strategic cruise missile for the Russian Navy. Since OKB Novator is the only cruise missile design facility in Yekaterinburg, Sergeyev was most likely referring to a Novator design.

-"Oruzhiya flota obnovitsya," *Nezavisimoye voyennoye obozreniye* online edition, http://nvo.ng.ru, 24 March 2000.

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2007-2000: TsSKB-PROGRESS

7 February 2003

COMPLETION OF SOYUZ-2 ROCKET ANTICIPATED

Russian Channel One reported on 7 February 2003 that work undertaken by TsSKB-Progress on the latest version of the R-7/Soyuz rocket series, the Rus Soyuz-2, is nearing completion. The new Soyuz-2 will consist exclusively of Russian-manufactured parts and will boast a more powerful engine, which will increase its payload capacity by approximately 1,500 kilograms (3,300 pounds). The Rus also will be equipped with modern digital and telemetry systems and primarily will be used to launch satellites in addition to cargo and manned spacecraft. The first launch of the rocket, whose cost will not differ appreciably from the current Soyuz launch vehicle, is planned for early 2004.

-Channel One TV, 7 February 2003; in "Work on new Russian carrier-rocket nears completion," FBIS Document CEP20030207000410.

23 October 2002

ENGINE BLOCK CITED AS CAUSE OF SOYUZ EXPLOSION

Pravda.ru reported on 23 October 2002 that TsSKB-Progress First Deputy General Director/General Designer Gennadiy Anshakov had announced the preliminary conclusions reached by a state commission investigating the explosion of a Soyuz-U booster rocket shortly after liftoff from the Plesetsk Cosmodrome on 15 October 2002. According to Anshakov, the commission members, on the basis of an examination of fragments salvaged after the explosion, identified its cause to be malfunctions in one of the lateral engine blocks. TsSKB-Progress assembled the rocket in question in 1999, although the Motorostroitel plant in Samara manufactured the engine. Given that 36 other launches involving the Soyuz-U booster have proceeded successfully since 1999, the experts concluded that the engine defect that caused this accident is of an isolated nature. As a result, the commission recommended that the launch of a piloted Soyuz TMA-1 spacecraft propelled by the related Soyuz-FG booster proceed as planned. Destined for the International Space System, the Soyuz TMA-1 is scheduled to be launched from the Baykonur Cosmodrome in Kazakhstan on 30 October 2002.

-"Vyyasneny prichiny vzryva rakety-nositelya na kosmodrome v Plesetske," Pravda.ru, http://science.pravda.ru, 23 October 2002.

16 October 2002

TsSKB-PROGRESS TO HELP INVESTIGATE FAILED SOYUZ LAUNCH

Agentstvo voyennykh novostey reported on 16 October 2002 that a team of experts from TsSKB-Progress, led by First Deputy General Director Gennady Anshakov, will assist in the investigation of a Soyuz-U booster rocket that exploded shortly after liftoff from the Plesetsk Cosmodrome. TsSKB-Progress manufactured the rocket and its payload, a Foton-M satellite. The incident, which represented only the 16th failure in over more than 400 launches, belied the normal reliable nature of the Soyuz-U. Pre-launch preparations and testing did not identify problems that foreshadowed the explosion in the 29th second of flight that killed one individual and injured eight others.

-Agentstvo voyennykh novostey, 16 October 2002; in "Design bureau experts join investigation of failed Plesetsk space launch," FBIS Document CEP20021016000416.

6 September 2002

DESPITE PROBLEMS FOTON PROGRAM IMPORTANT TO TsSKB-PROGRESS

In articles published in March and September 2002, the Samara newspaper *Delo* reported on the revival of the Foton satellite program at TsSKB-Progress following several years during which financial shortcomings severely restricted its development. TsSKB-Progress initiated the civilian Foton program in 1985, and it soon attracted the attention of foreign space agencies due to its unmatched ability to lift into orbit and return to Earth more than 700 kilograms (1,550 pounds) of scientific equipment. The Foton primarily can be used to conduct experiments on pure alloys and medications and the behavior of organisms in space. During the Soviet era, TsSKB-Progress produced the satellites on an annual basis for use in the domestic space program. The current Foton program, however, requires substantial modernization in order to ensure its continued viability. As a result, TsSKB-Progress increasingly has concentrated on commercial cooperation with foreign entities in response to reduced state financing of the program. Its current contracts with the European Space Agency, the French Space Agency, the German Space Agency, and individual European countries for cooperation on activities such as the Foton-M satellite scheduled to lift off from the Baykonur Cosmodrome on 15 October 2002, yield approximately €10 million ($9.9 million on 6 September 2002) in financing for the enterprise. This amount, in combination with the limited funding that TsSKB-Progress does receive from the state budget through the Federal Space Program, covers the majority of the cost of assembling the satellites and installing the prerequisite equipment. It does not, however, result in a significant profit for TsSKB-Progress because the difference between the funding received from foreign partners and the total cost of the project must be covered by Rosaviakosmos. Given that this state body owes TsSKB-Progress money in connection with financing its everyday activities, it is not likely that the Foton project will be financed in full.

-Gleb Stolyarov, "Dvadtsat let spustya," *Delo*, No. 8, 8 March 2002; in Integrum Techno, www.integrum.com. Gleb Stolyarov, "'Progress' otpravil 'Foton' v Plesetsk," *Delo*, No. 30, 6 September 2002; in Integrum Techno, www.integrum.com.

28 June 2002

IMPLEMENTATION OF AURORA PROJECT DELAYED

The Samara newspaper *Delo* reported on 28 June 2002 that complications related to intellectual property rights

have postponed implementation of the Russian-Australian Aurora space program until the end of 2002 at the earliest. Aurora is a $400 million project that involves production of a new booster rocket and construction of a space center on Christmas Island, an Australian territory in the Indian Ocean, in an attempt to gain a 10-20% share of the international space launch market. The terms of a contract signed in December 2001 called for the project to begin in February 2002 and for the first launch from the new facility to occur by the end of 2003. However, an inability during the most recent round of negotiations in June 2002 to resolve outstanding issues concerning ownership of the rights to the new technologies developed in the course of the project pushed back implementation at a minimum until a new round of discussions scheduled for the end of 2002. As a result, the proposed date for the first launch has been shifted to 2004-2005. Although RKK Energiya will serve as the main Russian contractor, TsSKB-Progress will be responsible for designing and producing the first and second stages of the rocket and its nose cone. Current plans call for the production center to modify the Yamal booster rocket that it initially developed on the basis of its standard Soyuz rocket.
-Gleb Stolyarov, "Prikazali dolgo zhdat," *Delo*, No. 24, 28 June 2002; in Integrum Techno, www.integrum.com.

21 June 2002

TSSKB-PROGRESS TO PREPARE ROCKET FOR MARS-EXPRESS SATELLITE

According to an article in the Samara newspaper *Delo* on 21 June 2002, TsSKB-Progress has begun to implement a contract concluded in December 2001 with the European Space Agency. The contract calls for TsSKB-Progress to assemble a Soyuz-Fregat rocket that will be used to launch a Mars-Express satellite in May or June 2003. TsSKB-Progress will participate in this project, which aims to study the surface of Mars through the Starsem joint venture, formed in 1996 together with Rosaviakosmos, the European Aeronautic Defence and Space Company, and Arianespace. In contrast to the Bion and Foton commercial projects in which TsSKB-Progress assembles both the booster rockets and satellites involved, TsSKB-Progress will be responsible only for the booster rocket in the Mars-Express project. The enterprise nevertheless expect to garner a profit from the project that is equal to twice the amount that it typically receives from the state for orders for the Soyuz booster.
-Gleb Stolyarov, "'Progress' zapustit novyy sputnik," *Delo*, No. 23, 21 June 2002.

7 May 2002

TsSKB-PROGRESS TO FINALIZE SPACE BIOLOGY CONTRACTAND BEGIN DESIGN OF RESURS-DK SATELLITE

According to an Agentstvo voyennykh novostey report on 7 May 2002, TsSKB-Progress plans to finalize by the end of 2002 space biology contracts with unidentified American partners. [Other press reports identify NASA as the potential American partner.] Under the terms of the contracts, TsSKB-Progress will resume production and assemble four Bion spacecraft for use in biological experiments on mice in outer space as part of preparations for extended manned space missions. The discontinuation of similar experiments in the mid-1990s following a Congressional ban on the use of apes in biological testing for all intents and purposes halted the production of the Bion. TsSKB-Progress also has initiated work on the Resurs-DK satellite, which will be equipped with new research instrumentation designed by Italian specialists and primarily will be used for studying high-energy space particles. These modifications, primarily to the design, layout, and onboard technical means, stem from the size and weight of the equipment to be installed in the Resurs-DK. Plans call for the first launch of the Resurs-DK to occur in 2003, and it is intended that the spacecraft will remain in space for a three-year period.

- Agentstvo voyennykh novostey, 7 May 2002; in "Russia's Progress aerospace center to sign contracts with U.S.," FBIS Document CEP20020507000215. Gleb Stolyarov, "Dvadtsat let spustya," *Delo*, No. 8, 8 March 2002; in Integrum Techno, www.integrum.com.

19 February 2002

PRODUCTION OF FOTON SATELLITES RESUMED

Agentstvo voyennykh novostey reported on 19 February 2002 that TsSKB-Progress had restarted production of the Foton satellite series following a three-year hiatus resulting from organizational and financial difficulties. TsSKB-Progress to date has completed the first stage of the newest satellite, Foton-13, and plans to fit the satellite with research and other equipment in the coming months in anticipation of a late summer or early autumn 2002 launch. The Foton-13 mission will conduct research on space technologies and thereby continue the tradition of the first twelve Foton satellites launched into orbit between 1985 and 1999.

-Agentstvo voyennykh novostey, 19 February 2002; in "Russian enterprise resumes production of Foton satellites," FBIS Document CEP20020219000032.

18 December 2001

CONTRACT UNDER AURORA PROJECT SIGNED

On 18 December 2001, Russian Aerospace Agency (Rosaviakosmos) Director Yuriy Koptev announced the signing of a contract with the Australian enterprise Asia Pacific Space Center (ASPC). The contract, concluded within the framework of the joint Russian-Australian Aurora space program, foresees the construction of a space center on Christmas Island, an Australian territory in the Indian Ocean. The program also envisions development by a group of Russian aerospace companies, including TsSKB-Progress, of a prototype launch vehicle called the Aurora for use in commercial launches from the new facility. Initial plans call for TsSKB-Progress to design and manufacture the first and second stages of the rocket, as well as its nose cone, on the basis of existing supplies of the NK-33 engine. Future plans, however, foresee Russia-based serial production of the Aurora. It is anticipated that implementation of the project will begin in February 2002.

-Gleb Stolyarov, "'Avroru' zapustyat s Rozhdestva," *Delo*, 25 December 2001, p. 14; in IA "Region-Inform," 28 December 2001; in Integrum Techno, www.integrum.com.

16 November 2001

CRIMINAL INVESTIGATION OF TsSKB-PROGRESS

According to an article in *Reporter* on 16 November 2001, the Samara police have initiated a criminal investigation into the activities of the top management of TsSKB-Progress, including Dmitriy Ilyich Kozlov. The investigation, accompanied by a comprehensive audit of the enterprise's finances, stems from allegations that the leadership of the production center abused its power, defrauding the enterprise of $850,000 in proceeds from the Starsem joint venture which TsSKB-Progress formed in 1996 together with the French companies Aerospatiale and Arianespace as well as Rosaviakosmos. This investigation, which had not been completed as of the end of 2002, began shortly after customs officials detained Vladimir Dmitriyevich Kozlov, the First Deputy General Director/Deputy General Designer for Foreign Economic Relations at TsSKB-Progress and Dmitriy Kozlov's son, at the airport as he allegedly attempted to bring $7,100 in undeclared currency into the country. During the ensuing investigation, law enforcement officials discovered a briefcase belonging to Vladimir Kozlov that contained $190,000 and unspecified

documents about the activities undertaken by TsSKB-Progress that may be considered commercial or even state secrets. Ina ruling that the local prosecutor appealed as too lenient, a Samara district court convicted Vladimir Kozlov of currency smuggling and fined him 5,000 rubles (nearly $170) on 10 October 2001. These events occurred during the buildup to local parliamentary elections in Samara Oblast in which Dmitriy Kozlov, who is considered a strong supporter of the Communist Party and close to Samara Mayor Georgiy Limanskiy, reportedly initially supported one candidate and then changed his endorsement shortly before the district court handed down its verdict in the case of Vladimir Kozlov.[6,7] As a result, some media commentators have attributed the legal difficulties encountered by TsSKB-Progress to broader political and personal motivations.
- Natasha Barbye, "Kosmicheskiy skandal," *Reporter*, 16 November 2001; in Integrum Techno, www.integrum.com. Aleksandr Shvarev, "S kosmicheskim razmakhom," *Vremya novostey*, No. 8, 18 January 2002; in Integrum Techno, www.integrum.com. Aleksandra Chernikova, "Tayna chernogo diplomata," *Reporter*, 2 November 2001; in Integrum Techno, www.integrum.com. "Samarskaya oblast. Prodolzhayetsya rassledovaniye ugolovnogo dela po 'TsSKB-Progress'," Regions.ru, 28 March 2002; in Integrum Techno, www.integrum.com. Sergey Kurt-Adzhiyev, "Boreshsya s korruptsiyey- boysya pera," NovayaGazeta.Ru, 8 April 2002; in Integrum Techno, www.integrum.com. "Prokuror Krasnoglinskogo rayona ne soglasen s resheniyem oblastnogo suda po delu zamestitelya generalnogo direktora," *Samara segodnya*, 25 October 2001; in Integrum Techno, www.integrum.com. NTV Program "Kriminal," 9 February 2002; in Agentstvo federalnykh rassledovaniy; in Integrum Techno, www.integrum.com. Vladimir Volokhov, "Milliard v prokurorskoy korzine," *Parlamentskaya gazeta*, No. 927(296), 12 March 2002; in Integrum Techno, www.integrum.com.

26 October 2001

TsSKB-PROGRESS PLANS TO UPGRADE SOYUZ ROCKET

According to a report by Strana.ru on 26 October 2001, TsSKB-Progress intends to modernize the Soyuz booster rocket that it has produced since 1968. Although the Soyuz continues to be in commercial demand, TsSKB-Progress will fit the rocket with improved first and second stage engines as well as a digital control system. These changes are planned for completion by 2003, if the project receives the necessary funding from the state.
-Strana.Ru; in Sergey Kuper, "Moralno ne ustarevayushchiy 'Soyuz'," Samara Information, www.samara.ru, 26 October 2001.

24 October 2001

COMMERCIAL VIABILITY OF AURORA PROJECT IN DOUBT

Vedomosti reported on 24 October 2001 that the Prime Ministers of France and Russia, Lionel Jospin and Mikhail Kasyanov, discussed Russian access to the Kourou Space Center in French Guyana during a recent meeting. If the European Space Agency approves its request, Russia intends to use Kourou for commercial satellite launches powered by the Soyuz booster rockets produced by TsSKB-Progress. It would, however, first need to build a launch site for Soyuz rockets on Kourou at an estimated cost of $150 million. Launches from the French Guyana space center, which is located much closer to the equator than the Baykonur Cosmodrome in Kazakhstan from which Soyuz rockets currently are launched, would save fuel and therefore decrease the cost of launches into geostationary orbit. The decision to pursue these plans would call into question the feasibility of the joint Russian-Australian Aurora project which foresees -- also at a cost of approximately $150 million -- construction of a new

space center on Christmas Island, an Australian territory in the Indian Ocean, in order to provide commercial launch services. In particular, it is questionable that the demand for commercial satellite launches would be sufficient to merit the existence of two similar projects. Current plans for the Aurora project, in which TsSKB-Progress also participates, anticipate that it would undertake between four and 15 launches per year beginning in 2003.
-Yuriy Granovskiy, "'Soyuz' razdelyat mezhdu ostrovom Rozhdestva i Kuru," *Vedomosti*, 24 October 2001; in Integrum Techno, www.integrum.com.

4 October 2001
PERMINOV ANNOUNCES PLANS FOR IMPROVED SATELLITE PRESENCE
According to a report in *Aerospace Daily* on 4 October 2001, Commander of the Space Troops Anatoliy Perminov indicated that the Ministry of Defense intends to deploy an unspecified number of new satellites to monitor potential U.S. military operations in Afghanistan following the 11 September 2001 terrorist attacks. As the only provider of photo-reconnaissance satellites for the Russian military, TsSKB-Progress, which Perminov visited prior to his announcement, will be expected to produce new Kobalt-class satellites to replace older satellites such as the Kosmos-2377 Kobalt photo-reconnaissance satellite deorbited at the end of September. Media reports indicate that the new satellites would be launched by November 2001 at the earliest and would represent the beginning of broader efforts to expand and improve Russian reconnaissance capabilities.
-Dmitriy Pieson, "Russia to Launch Reconnaissance Satellites to Monitor Afghanistan," *Aerospace Daily*, 4 October 2001.

23 July 2001
MODERNIZATION OF SOYUZ BOOSTER ROCKET PLANNED
Agentstvo voyennykh novostey, citing TsSKB-Progress General Director Dmitriy Kozlov, reported on 23 July 2001 that the production center has initiated work on a modified version of its Soyuz booster rocket, which is widely used by the Russian space program and by international consortia for launching commercial payloads. The new Soyuz-2 universal rocket booster gradually will replace the standard Soyuz and expand both orbiting and payload possibilities.
-Agentstvo voyennykh novostey, 23 July 2001; in "Russia designing new booster on basis of Soyuz rocket," FBIS Document CEP20010723000289.

11 July 2001
MODIFIED PLANE TO BE USED FOR SPACE LAUNCHES
Rossiyskaya gazeta reported on 11 July 2001 that a group of Samara-based aerospace enterprises, including TsSKB-Progress, are engaged in a project that envisions launching rockets from a modified An-124-100 airplane. Under the Vozdushnyy Start program, the An-124-100 will launch two-stage booster rockets from an altitude of 10-11 kilometers (6.2-6.8 miles). According to press reports, this air launch system is considered considerably less expensive than traditional ground launches and reportedly has drawn interest from South Africa, the Czech Republic, and countries in Southeast Asia and the Persian Gulf. Plans call for commercial launches to begin in 2002.
-Vyacheslav Belov, "Space Center On Board Aircraft," *Rossiyskaya gazeta*, 11 July 2001, p. 6; in "Russia to Use Ruslan An-124-100 to Launch Space Rockets," FBIS Document CEP20010711000191.

4 July 2001

FRENCH PRESIDENT CHIRAC VISITS TsSKB-PROGRESS

Nezavisimaya gazeta reported on 4 July 2001 that French President Jacques Chirac visited TsSKB-Progress during his state visit to Russia. TsSKB-Progress and two French partners, Aerospatiale and Arianespace, formed the Starsem joint stock company in 1996 with the support of the French and Russian governments. Starsem specializes in the commercial use of the Soyuz rocket launcher systems developed by TsSKB-Progress and plans call for its rockets to be involved in the development and maintenance of the Alfa International Space Station. During the visit, future French-Russian space cooperation was also discussed.

-Kseniya Fokina and Andrey Bondarenko, "Shirak skazal 'da', ne skazav 'net'," *Nezavisimaya gazeta* online edition, www.ng.ru, No. 119 (2429), 4 July 2001.

31 May 2001

FIRST LAUNCH OF SOYUZ-FG ROCKET SUCCESSFUL

In its May 2001 issue, *Novosti kosmonavtiki* reported on the first test launch involving the modified Soyuz-FG rocket booster developed by TsSKB-Progress. The Soyuz-FG, which successfully launched a Progress M1-6 spacecraft into orbit from the Baykonur Cosmodrome in Kazakhstan on 21 May 2001, represents an attempt to increase by 250-300 kilograms (550 to 650 pounds) the payload that its predecessor, the Soyuz-U, can lift into low Earth orbits. Improvements to the Soyuz-FG focus upon modifications to the engine, fuel, and propulsion systems. The Soyuz-FG, which primarily will be used to launch Progress-M1 spacecraft and perhaps piloted spaceships such as the Soyuz-TMA, is a stage in efforts to develop the Soyuz-2 rocket.

-I. Afanasyev, "'Progress M1-6' v polete," *Novosti kosmonavtiki*, No. 7, 1-31 May 2001.

21 April 2001

TsSKB-PROGRESS TO PARTICIPATE IN AURORA PROJECT

Kaliningradskaya pravda reported on 21 April 2001 that several Russian aerospace companies, including TsSKB-Progress, have begun work with the approval of the Russian government on a project that foresees construction of a new Aurora launch vehicle and a space center on Christmas Island, an Australian territory in the Indian Ocean. It is planned that the facilities and the launch vehicle, to be built at the request of an Australian company, the Asia Pacific Space Center (APSC), will be used for commercial launches of spacecraft. RKK Energiya, NPO Energomash, and the Barmin Design Bureau for General Machine Building (KBOM) also will be involved in the project. Representatives of these companies, APSC, and other companies engaged in the project approved design sketches of the Aurora system and the APSC Space Center during a meeting in Korolev on 18 April 2001.

-"Kosmicheskiye novosti," *Kaliningradskaya pravda*, 21 April 2001; in Integrum Techno, www.integrum.com.

18 May 2000

PLANE-BASED SPACE LAUNCH PROGRAM INITIATED

RIA Novosti reported on 18 May 2000 that several Russian companies intend to pursue a new space program that would entail the launch of satellites from modified airplanes such as the An-124-100. The Vozdushnyy Start corporation, which will implement the program, consists of TsSKB-Progress, RKK Energiya, Antonov ANTK, Pilyugin NPTs AP, and the Polet aviation company. Development of an airplane-based launch capability would allow the corporation to engage in space launches independent of a stationary space center. In addition, it is believed that

plane-based launches into exoatmospheric orbits would be cheaper than traditional land-based launches and would translate into an increased demand for the technology. It is anticipated that a draft concept of the project, which reportedly could create up to 100,000 new jobs, should be completed by the end of 2000. One of the ideas under discussion is a proposal by Polet to automate completely the launch sequence.
- Eduard Puzyrev, "Rossiya pristupayet k realizatsii unikalnogo kosmicheskogo proyekta-zapuskam sputnikov s borta samoleta," RIA Novosti, 18 May 2000; in Integrum Techno, www.integrum.com. Eduard Puzyrev, "Aviakompaniya 'Polet' predlagayet zapuski sputnikov po proyektu 'Vozdushnyy Start' polnostyu avtomatizirovat," RIA Novosti, 31 July 2000; in Integrum Techno, www.integrum.com.

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2007-2000: MKB RADUGA

1 December 2002

RADUGA BEGINS SERIAL PRODUCTION OF Kh-101 CRUISE MISSILE

According to a report in *Jane's Defence Upgrades* on 1 December 2002, the MKB Raduga factory in Smolensk has begun serial production of the Kh-101 air-launched cruise missile (ALCM). The Kh-101 conventional missile includes an electro-optimal terminal homing system which produces accuracy of between 12-20 meters (40-65 feet) and according to Russian press reports has a range of 5,000-5,500 kilometers (3,100-3,415 miles). Modernized Tu-95MS [NATO name 'Bear H'] and Tu-160 [NATO name 'Blackjack] strategic bombers eventually will be fitted with the Kh-101. The report also indicates that the Kh-32 anti-ship missile developed by Raduga presently is undergoing military launch tests from aircraft.
-Piotr Butowski, "Russia plans bomber fleet modernisation," *Jane's Defence Upgrades* online edition, http://jdu.janes.com, 1 December 2002.

14 August 2001

RADUGA'S EFFORTS RECOGNIZED

Dubna City Web Site reported on 14 August 2001 that MKB Raduga took second place in the "Zolotaya Ideya" (Golden Idea) contest sponsored by NOMOS-Bank and conducted by the Committee on Military-Technical Cooperation. Prizes were awarded for contributions in the area of developing new military products for export. Raduga's contributions included developing the Moskit-E, Ovod-ME missile systems, and the Rubezh-E self-propelled coastal defense missile system.
-"'Zolotaya ideya' - nasha!," City of Dubna, www.dubna.ru, 14 August 2001. "Osnovnyye itogi MAKS-2001," *Kommersant-Daily*, 20 August 2001; in Universal Database of Central Russian Newspapers, http://online.eastview.com.

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2007-2000: ENERGOMASH

22 August 2002

FIRST ATLAS 5 LAUNCH

The first launch of the US Atlas 5 rocket, using Energomash's RD-180 engine, took place on 22 August 2002 at Cape Canaveral. Commenting on the launch, Energomash General Director Boris Katorgin said that it would help sales of Russian space hardware on the world market. Moreover, according to Katorgin, there are no prohibitions against using the RD-180 in Russian space programs. By the time of the launch, Energomash had already delivered 14 RD-180 engines to the United States, at a cost of $10 million each. Energomash's partner in this venture is Lockheed Martin, which also uses the RD-180 engines in its Atlas 3 rocket.

- RTR Planeta TV, 22 August 2002; in "US' heavy Atlas rocket not seen as competitor by Russian space industry," FBIS Document CEP20020822000260. German Solomatin, Dayma Timergaliyeva, ITAR-TASS, 21 August 2002; in "Rocket powered by Russian engine launched from Cape Canaveral," FBIS Document CEP20020822000009.

17 September 2002

NEW CRITERIA FOR JOINT VENTURE LICENSES

ITAR-TASS, with reference to *Space News*, reported on 17 September 2002 that the Bush administration may use the process of issuing licenses to US-Russian joint ventures as a means of exerting influence on Russia to stop proliferation of rocket technologies. According to newly adopted rules, licenses will have to be renewed every six months, not annually as before. Russian efforts in the area of missile technology proliferation will be used as a criterion in deciding whether to renew the licenses. However, the report also noted that the US government may be deterred from this tactic by its reliance on Russian technologies. Energomash engines, for example, are to be used in space launches for the US Department of Defense.

-Ivan Lebedev, "SShA usilivayut davleniye na Rossiyu, dobivayas uzhestocheniya kontrolya za nerasprostraneniyem raketnykh tekhnologiy," ITAR-TASS, 17 September 2002; in Integrum-Techno, www.integrum.com.

26 July 2002

KATORGIN SUPPORTS SPACE LASERS

Energomash General Director Boris Katorgin told ITAR-TASS reporters on 26 July 2002 that a space-based chemical laser weapon could be useful in destroying asteroids on a collision course with Earth. Although no such weapon exists, according to Katorgin scientists in Russia and other countries are working on such lasers, and the international community is already discussing the need to build them.

-German Solomatin, ITAR-TASS, 26 July 2002; in "Russians suggest using laser to destroy approaching asteroid," FBIS Document CEP20020726000204.

3 April 2002

ENERGOMASH TO PARTICIPATE IN PROJECT VOLGA

Energomash representative Yuriy Korotkov informed ITAR-TASS reporters on 3 April 2002 that Energomash will participate in the development of Project Volga, a multinational project aimed at developing a reusable rocket engine using liquid methane. A memorandum on the project has already been signed in Moscow. Energomash's participation will include design and production of the new engine's components. A working model is expected

within two years. In addition to Energomash, the project participants include KB Khimavtomatiki and the M.V. Keldysh Research Center, as well as French company SNECMA, Astrium, and a number of Swedish and Belgian firms.
-Vladimir Rogachev, "Novyy raketnyy dvigatel mnogorazovogo ispolzovaniya sozdayetsya v ramkakh proyekta 'Volga'," ITAR-TASS, 3 April 2002; in Integrum-Techno, www.integrum.com.

31 January 2002

KATORGIN ON COOPERATION WITH UNITED STATES, KHRUNICHEV

Agentstvo voyennykh novostey reported on 31 January 2002 that Energomash General Director Boris Katorgin said that he expects Energomash to produce 101 rocket engines for export. So far, Energomash has contracts with Lockheed Martin for 29 engines, 13 of which have been delivered. The projected sales of the rocket engines would provide Energomash with sufficient funding until 2010. The situation is less encouraging in regard to cooperation with the Khrunichev Center on the Angara SLV. Although Energomash is developing the RD-191 engine for the Angara, it has received only limited funding from the Russian government for the project. It did receive some funds from Khrunichev but, according to Katorgin, about half of the funding for the Angara project came from Energomash itself.
-Yuriy Granovskiy, "Interview: General Director and General Designer of NPO Energomash," *Vedomosti*, 31 January 2002; in "Energomash Director Interviewed on Rocket Engines, Aerospace Sector Reforms," FBIS Document CEP20020131000311.

17 December 2001

ENERGOMASH COMPLETES RD-180 DELIVERIES FOR 2001

Agentstvo voyennykh novostey reported on 17 December 2001 that Energomash completed the plan of RD-180 deliveries to the United States for 2001. Ten engines have already been shipped, three more were ready for immediate shipment, and additional five are under construction for delivery in 2002.
-Agentstvo voyennykh novostey, 17 December 2001; in "Russia's Energomash implements plan of rocket engine supplies to US," FBIS Document CEP20011217000111.

26 November 2001

ROCKET TEST STAND REPAIRS COMPLETE

Agentstvo voyennykh novostey reported on 26 November 2001 that Energomash completed repairs of a test stand used for firing tests of rocket engines. The test stand began operation 25 years ago, but 10 years ago it fell into disrepair. Repairs of the test stand were made possible by cooperation with US company Lockheed Martin, which provided $5 million for upgrades at Energomash's testing complex. (For more information, see the following 3/23/2000 entry)
-Agentstvo voyennykh novostey, 26 November 2001; in "Russia: Energomash ends repairs of firing bench," FBIS Document CEP20011126000063.

17 October 2001

EVANS VISIT TO BENEFIT ENERGOMASH

Rosaviakosmos and Pratt & Whitney, which is engaged in close cooperation with Energomash, signed a

cooperation agreement on 17 October 2002. The signing took place during the visit of US Commerce Secretary Donald Evans to Moscow. The agreement is expected to expand the level of cooperation between Pratt & Whitney and Russian entities.
-"Our Engine in US Rockets," *Rossiyskaya gazeta*, 19 October 2001, p. 4; in "Rosaviakosmos, Pratt and Whitney Sign 'Large-Scale' Deal During Evans Visit," FBIS Document CEP20011019000275.

30 May 2001
PLANS TO PRODUCE RD-180 IN THE UNITED STATES DELAYED
ITAR-TASS reported on 30 May 2001 that plans to produce RD-180 engines in the United States have been postponed until 2008. Until that time, US SLVs using the RD-180 will utilize engines manufactured by Energomash. The US State Department and Russian Ministry of Defense are expected to work out an agreement on protecting Russian intellectual property in the course of implementing this project.
-"Rossiysko-amerikanskoye SP 'RD-Amros" sokhranyayet plany po proizvodstvu dvigateley RD-180 v SShA, no otkladyvayet ikh do 2008 goda," ITAR-TASS, 30 May 2001; in Integrum-Techno, www.integrum.com.

11 April 2001
RD-180 DELIVERIES CONTINUE
Interfax reported on 11 April 2001 that Energomash is to supply 18 RD-180 engines to the United States, for use in Atlas 3 and Atlas 5 rockets. Eight engines have already been sent. Energomash General Director Boris Katorgin denied allegations that Energomash is planning to assist US firms in manufacturing the missiles themselves. The total number of RD-180 engines that will be supplied to Lockheed Martin may reach 101.
-Interfax, 11 April 2001; in "Russian company to supply 18 engines for US new carrier rockets," FBIS Document CEP20010411000355. RIA, 20 February 2001; in "Russia to supply 101 engines for US Atlas 3 booster rocket," FBIS Document CEP20010220000194.

28 August 2000
RD-180 PRODUCTION TO BEGIN IN THE UNITED STATES IN 2005
Interfax reported on 28 August 2000 that, according to Energomash General Director Boris Katorgin, RD-180 rocket engine production in the United States will begin no sooner than 2005. According to Katorgin, studies and documents on arranging such production are being prepared, but the complexity of the process may push the date past 2005.
-"Russian RD-180 rocket engines not to be made in U.S. before 2005," Interfax, 28 August 2000.

10 August 2000
BOEING WILL NOT ACQUIRE STAKE IN ENERGOMASH
Interfax reported on 10 August 2000 that Energomash had denied reports that the US company Boeing would become one of its owners. At the same time, Energomash General Director Boris Katorgin spoke in favor of making Energomash a publicly traded company, in order to compensate for the virtual absence of state funding since 1992. As a result, Energomash has not been able to upgrade its equipment for nearly a decade. Previously, Energomash had planned to sell 29% of its shares in order to finance modernization. However, the privatization was halted in 1998.

-"Energomash denies plan to sell shares to Boeing," Interfax, 10 August 2000. Interfax, 25 July 2000; in "Russia: Energomash Denies Sale of RD-Invest Shares to Foreigners," FBIS Document CEP20000725000064.

25 May 2000

FIRST ATLAS 3A LAUNCH

The first launch of Lockheed Martin's Atlas 3A rocket, using Energomash RD-180 engine supplied to the United States through a joint venture with Pratt & Whitney, took place from Cape Canaveral on 25 May 2000.
-Tom Breen, "Atlas 3A Is a Success on First Flight," *Florida Today*, 25 May 2000.

27 March 2000

YEDINSTVO PROJECT SUSPENDED

Agentstvo voyennykh novostey reported on 27 March 2000 that the Australian company United Launch Systems (ULS) had suspended financing of the Yedinstvo SLV. The main Russian firm participating in the project was Makeyev Design Bureau, with Energomash developing engines for the rocket. As a result of the cessation of funding, Energomash halted the development of DP-220U rocket engine intended for Yedinstvo.
-"Avstraliyskaya storona priostanovila finansirovaniye rabot po sozdaniyu raketno-kosmicheskogo kompleksa 'Yedinstvo'," Agentstvo voyennykh novostey, 27 March 2000; in Integrum-Techno, www.integrum.com.

23 March 2000

LOCKHEED MARTIN TO PAY FOR ROCKET TEST STAND UPGRADE

Agentstvo voyennykh novostey reported on 23 March 2000 that $5 million of the $25 million sum allocated by Lockheed Martin to Energomash for modernization of its production facilities will be used to upgrade an obsolescent rocket test stand.The upgrade will entail installing computerized diagnostic and control equipment. After modernization, the stand will be able to test rocket engines with thrust of up to 1000 metril tons.
-"Modernizatsiyu ognevogo stenda po ispytaniyu zhidkostnykh raketnykh dvigateley NPO 'Energomash' provedet na sredstva korporatsii Lockheed Martin," Agentstvo voyennykh novostey, 23 March 2000; in Integrum-Techno, www.integrum.com.

22 March 2000

WORK ON ROCKET ENGINES USING LIQUID METHANE SUSPENDED

Agentstvo voyennykh novostey reported on 22 March 2000 that Energomash suspended development of rocket engines using liquefied methane due to financial reasons. According to Energomash research, liquid methane promises greater thrust, fewer environmental concerns, and lower cost, in comparison with kerosene. Energomash has been working on this technology since 1981.
-Agentstvo voyennykh novostey, 22 March 2000; in "Energomash Suspends Liquid Methane Rocket Production," FBIS Document CEP20000322000258.

14 March 2000

ENERGOMASH HOPES FOR LONG-TERM PARTNERSHIP WITH US FIRMS

Energomash General Director Boris Katorgin said on 14 March 2000 that he hoped for a long-term partnership with US firms in the development of RD-180 rocket engines for US rockets. The Energomash agreement with Lockheed

Martin specifies the sale of 101 RD-180 engines, a provision that will take 10 years to fulfill. The cooperation will also entail organizing production of RD-180 engines in the United States. The Russian government has already issued permission to create a joint venture that would be engaged in manufacturing these engines, and Lockheed Martin has lent Energomash $25 million to modernize its facilities. Four RD-180 engines were delivered in 1999.
-"Russia sees long-term partnership with U.S. in development of rocket engines," Interfax, 14 March 2000.

15 February 2000
ENERGOMASH COMPLETES DESIGNS OF ENGINES USING LIQUID NATURAL GAS
Agentstvo voyennykh novostey reported on 15 February 2000 that Energomash and Makeyev Design Bureau completed joint design work on several types of rocket engines using liquefied methane for fuel. Energomash General Director Boris Katorgin said that methane has a 20-30% thrust advantage over kerosene, and represents the future of space launch vehicle development.
-"Zaversheny proyektnyye razrabotki raketnykh dvigateley, ispolzuyushchikh v kachestve topliva szhizhennyy prirodnyy gaz," Agentstvo voyennykh novostey, 14 February 2002; in Integrum-Techno, www.integrum.com.

10 January 2000
WORK ON MAKS CONTINUES
Agentstvo voyennykh novostey reported on 10 January 2000 that NPO Molniya and NPO Energomash are continuing their efforts to develop the Multifunctional Aerospace System (MAKS) space plane in spite of a lack of government funding. The project dates back to the 1980s. Energomash's share of the work includes the development of the space plane's rocket engine. There are hopes that MAKS will reduce the cost of putting cargo in orbit to just $1,200 per 1kg, as compared to $3,500 per 1kg for the Proton space rocket.
-"Nauchno-proizvodstvennoye obyedineniye 'Molniya' prodolzhayet razrabotku mnogotselevoy aviatsionno-kosmicheskoy sistemy MAKS," Agentstvo voyennykh novostey, No. 111, 10 January 2001; in Integrum-Techno, www.integrum.com.

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2007-2000: ISAYEV KB KHIMMASH

24 June 2002
STATE HOLDING COMPANY "RUSSIAN ROCKET ENGINES" ENVISIONED
The newspaper *Samarskoye obozreniye* reported on 24 June 2002 that at the beginning of June 2002 the Russian government determined which organizations in the aerospace industry would be candidates to join a state holding company to be called Russian Rocket Engines (Rossiyskiye raketnyye dvigateli). According to plans developed by the government, the Isayev Design Bureau is one of said candidates. Other candidates include the V.P. Glushko Scientific Production Association for Energy Machine Building in Moscow (NPO energeticheskogo mashinostroyeniya imeni V.P. Glushko); the Design Bureau for Chemical Automation in Voronezh (Konstruktorskoye byuro khimavtomatiki); the Voronezh Mechanical Plant (Voronezhskiy mekhanicheskiy zavod); the Fakel State Testing and Design Bureau in Kaliningrad (Gosudarstvennoye opytno-konstruktorskoye byuro

"Fakel"); the Scientific Research Institute of Machine Building in Sverdlovsk (NII mashinostroyeniya); and Motorostroitel in Samara.
-Dmitriy Begun and Konstantin Lange, "Korporatsiya 'Dvigateli NK' sozdana poka tolko na bumage," *Samarskoye obozreniye*, No. 25, 24 June 2002; in Integrum Techno, www.integrum.com.

20 April 2001
INDIA LAUNCHES ROCKET WITH ISAYEV-PRODUCED ENGINE
On 19 April 2001, India successfully launched from its Shrikharikota Space Center a GSLV rocket carrying an experimental satellite to a geostationary orbit of 36,000 kilometers (22,370 miles) and thereby became the fifth country capable of lifting satellites into this orbit. The United States, Russia, Japan, and China also possess this capability, as does the European Space Agency. The Isayev Design Bureau manufactured the third-stage sustainer engines for the GSLV rocket, whose engine assembly functions on liquid cryogenic fuel consisting of oxygen and hydrogen. The Khrunichev State Space Science Production Center provided the booster unit for the GSLV rocket and the engines were tested at the Scientific Research Institute for Chemical Machine Building in Sergiyev Posad.
-Sergey Leskov, "Derzhava nomer shest," *Izvestiya*, No. 71, 20 April 2001; in Integrum Techno, www.integrum.com.

17 April 2001
PLANS TO SUPPLY CRYOGENIC ROCKET ENGINES TO INDIA
Interfax reported on 9 April 2001 that the General Director of the Khrunichev State Space Science Production Center announced that within the next two to three years Khrunichev will supply five new 12 KRB booster units for the Indian GSLV program. These new cryogenic booster units are used to place communication satellites into geostationary orbit. The Isayev Design Bureau for Chemical Machine Buildingin Korolev assisted in the development of the booster units.
-"Khrunichev Space Center to Supply Rocket Booster Units to India," *Interfax*, 9 April 2001; in Integrum Techno, www.integrum.com.

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2007-2000: PLESETSK TEST SITE

1 April 2002
DEPUTY DEFENSE MINISTER KUDELINA VISITS PLESETSK
Deputy Defense Minister Lyubov Kudelina, chief of the military's finances, paid a visit to the Plesetsk facility to familiarize herself with its financial issues, examine its infrastructure, and observe the launching of a Molniya-M SLV. The Ministry of Defense press service has stressed that Plesetsk will become the focus of Russia's space activities, and will be the site for launching new-generation SLVs such as Soyuz-2 and Rokot. There are also plans to built facilities for launching the new Angara heavy SLV from Plesetsk.
-ITAR-TASS, 1 April 2002; in "Russia: New space missile complexes to be developed at Plesetsk," FBIS Document CEP20020401000084.

14 February 2002

PLESETSK TO BECOME RUSSIA'S MAIN SPACE LAUNCH FACILITY AFTER 2005

Speaking to Agentstvo voyennykh novostey reporters on 14 February 2002, Deputy Defense Minister and Construction and Quartering Chief Colonel General Aleksandr Kosovan announced that Plesetsk will become the site of most of Russia's space launches after 2005. President Putin reportedly ordered that the Plesetsk facility be used to the greatest extent possible and adapted for heavy SLVs. According to Kosovan, Plesetsk will require $105 million for the necessary upgrades, which is less than the $115 million Russia pays Kazakhstan annually for the use of Baykonur. Nevertheless, the new emphasis on Plesetsk does not mean Russia will cease using Baykonur altogether, according to Kosovan. Kosovan's statements were confirmed three days later by Defense Minister Sergey Ivanov, who also said that although the number of Ministry of Defense launches from Plesetsk will grow, the military will not be its sole user. Priority will be given to dual-purpose launches that will serve both military and civilian interests. Sergeyev also noted that Plesetsk's infrastructure will require improvements, including the construction of an airport capable of accepting heavy transport aircraft, and improvements in power supply systems.

- Agentstvo voyennykh novostey, 14 February 2002; in "Most Russian Space Launches From Plesetsk After 2005," FBIS Document CEP20020214000153. Agentstvo voyennykh novostey, 27 February 2002; in "Russia's Ivanov: improvement of Plesetsk doesn't mean withdrawal from Baykonur," FBIS Document CEP20020227000229.

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2007-2000: SVOBODNYY COSMODROME

11 December 2002

BLAGOVESHCHENSK RESIDENTS PROTEST PROPOSED LAUNCHINGS OF STRELA ROCKETS

ITAR-TASS reported on 11 December 2002 that environmental concerns have prompted many residents in the city of Blagoveshchensk to protest future launchings of Strela boosters, which use heptyl as a fuel source, from nearby Svobodnyy Cosmodrome. Numerous meetings have been held and a letter of protest including a list of signatures was submitted to Russian President Vladimir Putin in December 2002.The Deputy Director of NPO Mashinostroyeniya, Petr Nosatenko, claimed that Strela rockets are much cleaner than solid-fuel missiles and that the byproduct of the rockets' engines would be water. Svobodnyy Commander Colonel Vladimir Tyurin also stated that launchings of Strela rockets at Svobodnyy will not endanger the environment or people of the Russian Far East.

- Boris Savelyev, "Zapretit puski s kosmodroma 'Svobodnyy' raket na geptilovom toplive trebuyut ekologi Amurskoy oblasti," ITAR-TASS, 11 December 2002. Nikolay Belyy, "Kosmodrom Svobodnyy: Vtoroye dykhaniye," Dalnevostochnyy Federalnyy Okrug Web Site, www.dvfo.ru, 26 December 2002.

13 September 2002

SPACE GENERAL PREDICTS STRELA LAUNCHES AT SVOBODNYY BY THIRD QUARTER OF 2003

Space-Inform, with reference to ITAR-TASS, reported on 13 September 2002 that Russian Space Forces Commander Colonel General Anatoliy Perminov had said that a Strela rocket will be launched from Svobodnyy in

the third quarter of 2003.
-"Pervyy start RN 'Strela' s kosmodroma 'Svobodnyy' namechen na tretiy kvartal 2003 goda," Ukrainian Aerospace Portal, www.nkau.gov.ua, 13 September 2002.

20 February 2001
SWEDISH ODIN SATELLITE LAUNCHED FROM SVOBODNYY COSMODROME
The Swedish satellite Odin was launched on 20 February 2001 from Svobodnyy utilizing a Start-1 booster.The satellite is intended for scientific purposes.
-"Chronology: Year 2001," RussianSpaceWeb.com, 3 December 2002.

5 December 2000
EROS SATELLITE LAUNCHED INTO ORBIT
On 5 December 2000, the EROS-A1 satellite was launched into orbit from Svobodnyy using a Start-1 rocket.The EROS-A1 is supposedly the first in a series of satellites to be launched by ImageSat International.
-"IAI EROS A1 Commercial Satellite Successfully Launched," Israeli Aircraft Industries LTD, www.iai.co.il, 5 December 2000.

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1999-1996: KRASNOYARSK MACHINE-BUILDING PLANT

7 May 1998
YELTSIN ORDERS PAYMENT OF KRASMASH WAGE ARREARS
President Yeltsin signed a resolution to pay all federal wage arrears to workers at the Krasnoyarsk Machine-Building Plant on 7 May 1998. The resolution was announced by Yuri Moskvich, Yeltsin's plenipotentiary representative in Krasnoyarsk Kray. First Vice-Governor Vladimir Kuzmin said that this decision "has opened wide prospects to this unique enterprise."
-RIA Novosti, 7 May 1998.

28 September 1997
WAGE ARREARS SPARK PROTESTS AT KRASMASH
Hundreds of striking workers from the Krasnoyarsk Machine-Building Plant, who last received wages in October 1996, paralyzed traffic on Newspaper Krasnoyarskiy Rabochiy Avenue on 28 August 1997. Workers called for the removal of the plant administration and threatened to turn over files on the plant's directors to the local prosecutor's office. *Izvestiya*claimed that while the Ministry of Defense was expecting to receive SLBMs from the plant, Krasmash had not received a state order for 1997, nor had it been paid for work being performed. The labor group Working Russia played a leading role in organizing the demonstration, and some violent incidents were reported.
-Aleksey Tarasov, "Disturbances at Military Plant in Krasnoyarsk," *Izvestiya*, 29 August 1997, p. 2; in "Workers Continue Disturbances at Krasnoyarsk Plant," FBIS-SOV-97-248, 5 September 1997.

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1999-1996: MAKEYEV DESIGN BUREAU

19 March 1999

MAKEYEV MAY PARTICIPATE IN AIR LAUNCH

ITAR-TASS reported on 19 March 1999 that Russian aviation firm Polet and a number of Russian aerospace firms have initiated the Air Launch project which would use the An-124 heavy transport aircraft to launch satellites into low Earth orbits using specially adapted booster rockets. According to the project promoters, this method of launching satellites would reduce launch costs, increase the booster rocket's payload, and would not require specialized space launch facilities. Polet is seeking to attract foreign partners to the project. The Makeyev Design Bureau has been identified as a possible provider of converted SLBMs for use as booster rockets in the project.
-ITAR-TASS, 19 March 1999; in "Russian Plans to Launch Satellites from Plane," FBIS Document FTS19990319000610.

24 December 1999

SLBM PRODUCTION TO RESUME

Nezavisimoye voyennoye obozreniye reported on 24 December 1999 that the military-industrial commission chaired by Prime Minister Vladimir Putin decided in September 1999 to renew the production of the R-29RM SLBMs [NATO designation SS-N-23 'Skiff']. This decision was reportedly based on the need to renew production of existing ICBM types while the new Bulava SLBM is under development. In addition to Makeyev, the Miass and Zlatoust Machine-Building Plants will also be involved in the production.
-Valeriy Aleksin, "Vozrozhdeniye morskogo raketostroyeniya," *Nezavisimoye voyennoye obozreniye* on-line edition, http://nvo.ng.ru, 24 December 1999.

10 February 1999

AUSTRALIAN SPACE COOPERATION PROPOSAL APPROVED

On 10 February 1999 Prime Minister Yevgeniy Primakov signed a government resolution approving a Rosaviakosmos proposal for cooperation between the Makeyev center, Energomash, and the Australian firm United Launch Services International (ULSI) on conducting space launches from Australian territory. The government also approved a proposal to develop the Yedinstvo (Unity) SLV for use in Russian-Australian cooperative projects. The projects will not violate missile technology proliferation regimes.
-Interfax, 10 February 1999; in "Primakov Approves Proposal on Australian Space Coopertion [sic]," FBIS Document FTS19990210000911.

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1999-1996: MITT

28 October 1999

MITT SPECIALISTS DEVELOP ROCKET FUEL ELIMINATION TECHNOLOGY

Agentstvo voyennykh novostey reported on 28 October 1999 that MITT scientists had developed solid rocket fuel elimination technologies that are ecologically superior to the ones used by the US firm Lockheed Martin, which is seeking to apply them in ICBM elimination projects in Russia. MITT and US specialists are performing joint experiments in rocket engine elimination techniques that are supposed to be used at the rocket elimination plant to be built in Votkinsk.

-Agentstvo voyennykh novostey, "V Votkinske pri utilizatsii raketnykh dvigateley budut ispolzovatsya ekologicheski bezopasnyye tekhnologii," 28 October 1999; in Universal Database of Russian Military and Security Periodicals, http://online.eastview.com.

10 July 1999

MITT DIRECTOR SUPPORTS LUZHKOV

In the 10 July 1999 issue of *Moskovskaya pravda* Moscow mayor Yuriy Luzhkov expressed his gratitude to a number of supporters of his re-election bid, including MITT General Director Yuriy Solomonov whose formal introduction of Luzhkov's candidacy on the ballot the Moscow mayor chose to accept.

-Yuriy Luzhkov, "Nadeyus na vashu podderzhku," *Moskovskaya pravda*, 10 July 1999; in Universal Database of Central Russian Newspapers, http://online.eastview.com.

12 January 1999

MITT TO PARTICIPATE IN SVOBODNYY DEVELOPMENT

Krasnaya zvezda reported on 12 January 1999 that Prime Minister Yevgeniy Primakov signed a directive obligating MITT to provide partial funding for the development of Svobodnyy space launch facility (a former ICBM base). Svobodnyy activities include launches of MITT's Start-1 conversion SLVs. MITT will share that responsibility with NPO Mashinostroyeniya, whose Strela SLVs will also be launched from the Svobodnyy facility.

-"'Strela' na kosmodrome Svobodnyy," *Krasnaya zvezda*, 12 January 1999; in Universal Database of Russian Military and Security Periodicals, http://online.eastview.com.

4 March 1997

FIRST START-1 LAUNCH FROM SVOBODNYY

On 4 March 1997, the Svobodnyy space launch facility launched the first Start-1 SLV, which is based on MITT's Topol ICBM. This was the first space launch in Svobodnyy's history, which previously had served as an ICBM base. -S.N. Bykov, "Svobodnyy - novyy kosmodrom Rossii," *Novosti kosmonavtiki*, No. 5, 1997; in Pervoye Sentyabrya publishing house Web Site, http://archive.1september.ru.

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1999-1996: AAK PROGRESS

12 April 1999

SITUATION AT PROGRESS SEEN AS IMPROVING

Russkoye byuro novostey reported on 12 April 1999 that the financial situation at Progress had started to improve due to export orders received through Rosvooruzheniye. Production levels at the plant in the first quarter of 1999 were seven times higher than in the first quarter of 1998, and the value of exports 23.6 times higher than in all of 1998. The main reason for the upturn in Progress' fortunes is income from sales of 3M-80 Moskit missiles.

-"Arsenyevskaya aviastroitelnaya kompaniya 'Progress' uvelichivayet obyemy produktsii," Russkoye Byuro Novostey, 12 April 1999; in Integrum Techno, www.integrum.ru.

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1999-1996: NOVATOR

10 December 1999

NOVATOR TO INCREASE WORKFORCE

Deputy Prime Minister Ilya Klebanov announced on 10 December 1999 that Novator would be able to increase its workforce and resume a three-shift schedule due to production requirements for missiles for the S-300V air defense system. Klebanov also promised that the Russian government would pay all of its defense order debts by May 2000 and double its defense orders in 2000.

-Nadezhda Potapova, "Russia company taken on workers to make air-defence systems," ITAR-TASS Weekly News, 10 December 1999, in East View Universal Database of Central Russian Newspapers, http://online.eastview.com.

15 November 1999

3M54E MISSILE TO BE DISPLAYED IN MALAYSIA

ITAR-TASS reported on 15 November 1999 that Novator Design Bureau planned to display its 3M54E anti-ship missile at the LIMA-99 defense exhibition in Malaysia. The exhibition will be held between 30 November and 5 December 1999.

-ITAR-TASS Weekly News, 15 November 1999; in East View Universal Database of Central Russian Newspapers, http://online.eastview.com.

14 October 1999

SMIRNOV'S KILLERS CONVICTED

Kommersant-daily reported on 14 October 1999 that the Sverdlovsk Oblast court found Yuriy Pindzhenin, a former business associate of Novator General Director Valentin Smirnov, guilty of ordering the assassination of Novator's general director and sentenced him to 15 years of imprisonment. Five of Pindzhenin's accomplices were sentenced as well.

-Viktor Smirnov, "Sozdatelya S-300 ubil tenevoy biznes," *Kommersant-Daily*, 14 October 1999; in East View Universal Database of Central Russian Newspapers, http://online.eastview.com.

10 September 1999

3M54E MISSILE CLEARED FOR EXPORT

ITAR-TASS reported on 10 September 1999 that the 3M54E anti-ship cruise missile, belonging to Novator's Club missile system, received its export clearance. The first ships to receive these missiles will be the three Project 1135.6 frigates under construction for India.

-ITAR-TASS, 10 September 1999; in "Russian High-Tech Missile System Cleared for Export," FBIS Document FTS19990910001489.

2 September 1998

NOVATOR PROPERTY IMPOUNDED FOR NON-PAYMENT OF TAXES

Trud reported on 2 September 1999 that the Sverdlovsk directorate of the Federal Tax Police impounded property belonging to the Novator Design Bureau. This move was reportedly caused by Novator's failure to pay federal taxes. Novator General Director Pavel Kamnev protested this action by pointing out that Novator, as a state enterprise, is exempt from paying penalties for late payment of taxes, and that in any event its indebtedness was caused by the Ministry of Defense's failure to pay what it owes Novator for past orders. In 1998 alone the MOD placed orders worth 38 million rubles with Novator without paying for them.

-Vitaliy Potapov, "Ugodil 'Novator' pod nalogovyy press," *Trud*, 2 September 1998; in East View Universal Database of Central Russian Newspapers, http://online.eastview.com

6 June 1998

NOVATOR DIRECTOR REQUESTS PAYMENT OF DEFENSE DEBTS

Rossiyskaya gazeta reported on 6 June 1998 that a group of directors of defense enterprises based in the Urals, including the Novator Design Bureau General Director Pavel Kamnev, traveled to Moscow to find out when the Russian government will pay for already fulfilled Ministry of Defense (MOD) orders. MOD debts to enterprises in Sverdlovsk Oblast have reached 680 million rubles. As a result the enterprises have been unable to pay their workers' salaries for as many as five months at a time, suffered losses of utility services, and experienced other difficulties.

-Aleksey Vladykin, "'Oboronka' - shag iz kruga," *Rossiyskaya gazeta*, 6 June 1998; in East View Universal Database of Central Russian Newspapers, http://online.eastview.com.

18 May 1998

NEW AIR DEFENSE SYSTEM USES NOVATOR MISSILES

Krasnaya zvezda reported on 28 May 1998 that Antey, one of the leading Russian air defense system design bureaus, unveiled a new long-range air defense system based on the Soviet-era S-300V, designated Antey-2500. The system incorporates 9M82M and 9M83M missiles with ranges of up to 200km designed at the Novator Design Bureau.

-Vladimir Dernovoy, "'Antey-2500' - novoye slovo rossiyskikh oboronshchikov," *Krasnaya zvezda*, 28 May 1998; in East View Universal Database of Military & Security Periodicals, http://online.eastview.com.

10 September 1996

NOVATOR PROPERTY IMPOUNDED

Izvestiya reported on 10 September 1996 that Novator Design Bureau became one of 400 Sverdlovsk Oblast enterprises whose property was partially impounded to pay off debts. In Novator's case the debt is caused mainly by the Russian government's inability to finance its defense orders.
-Aleksandr Pashkov, "U 400 predpriyatiy Sverdlovskoy oblasti arestovano imushchestvo," *Izvestiya*, 10 September 1996; in East View Universal Database of Central Russian Newspapers, http://online.eastview.com.

20 March 1996
NOVATOR GENERAL DESIGNER ASSASSINATED
On 20 March 1996 Novator Design Bureau General Designer Valentin Smirnov was assassinated in his apartment building in Yekaterinburg by a contract killer using a silenced pistol. Local law enforcement organs identified the main suspect as Yuriy Pindzhenin, the director of Novator Production-Commercial Bureau which was engaged in the sale of precious metals from electronics of missiles withdrawn from service. The bureau was created by Smirnov as a defense conversion enterprise in order to raise revenue for the Novator Design Bureau. However, Pindzhenin defrauded the enterprise, stealing up to 50kg of gold, and allegedly ordered Smirnov killed when the latter discovered the violations.
-Viktor Smirnov, "Arestovan ubiytsa izvestnogo konstruktora," Agentstvo federalnykh issledovaniy Web Site, www.flb.ru, 12 April 1996.

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1999-1996: SVOBODNYY COSMODROME

24 December 1997
FIRST COMMERCIAL SATELLITE LAUNCHED FROM SVOBODNYY
The Svobodnyy Cosmodrome launched its first commercial satellite on 24 December 1997 when it delivered the EarlyBird 1 into orbit. The launch of the high-resolution remote sensing satellite was financed by the US company EarthWatch (renamed DigitalGlobe in 2001).
-EarthWatch Incorporated News Release "EarthWatch Successfully Launches EarlyBird Imaging Satellite"; in *Florida Today* online edition, www.floridatoday.com, 25 December 1997.

4 March 1997
SVOBODNYY LAUNCHES ZEYA SATELLITE
The first successful launch at Svobodnyy took place on 4 March 1997 when a Start-1 rocket (based on the Topol ICBM [NATO designation SS-25 'Sickle']) delivered the experimental Zeya satellite into orbit.
-"Svobodny Launch System, Russia," Space Technology, www.space-technology.com.

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