



Land Launch. Photo courtesy of TsENKI.

Expanding portfolio

Since the NSS-8 launch failure in January 2007, Sea Launch has made a speedy recovery and a triumphant return to missions. Now their launch portfolio is set to expand further with the selection of Land Launch by Intelsat. We find out about Land Launch and what the other major launch providers have been working on.

The Sea Launch team have a very big reason to be smiling. Just ten months after the failed launch of NSS-8, they have delivered their most accurate launch to date in the form of the Thuraya-3 satellite that was delivered into Geosynchronous Transfer Orbit on January 15 2008. Some said that they would never recover but they have proved the doubting Thomas's wrong and their 'Mission Recovery' is now well and truly completed. The damage to the Sea Launch platform was considerable and there was a great deal of problem solving involved in getting the system up and running again but the team-work paid off, in a big way.

The flexibility and determination of the team was reflected in the delay of the Thuraya launch, which was initially scheduled to take place on November 13 2007, was postponed due to unusually strong ocean currents. After consulting oceanographers, Sea Launch was able to learn more about the ocean and how to deal with the disruptive currents. As a result of further research, this has helped them to contend even more effectively with the peculiarities of working at

sea. They have built any issues that may arise with the ocean into their future launch schedules. Further proof of how Sea Launch takes on a problem and solves it.

During the past ten months, Sea Launch has signed contracts for launches with SES and Intelsat, sealing operator's confidence in their operations. *See news section for latest launch success.*

Land Launch

Land Launch is a consortium comprising Sea Launch and Space International Services Ltd of Moscow. The Land Launch site, based at the Baikonour Space Centre, uses existing Zenit infrastructure and provides transportation into space for medium weight satellites. The launch vehicle used is a Zenit-3SLB and can accommodate commercial satellites that weigh up to 3.5 metric tonnes, but can also lift payloads up to 13 metric tonnes into low earth orbit.

The system itself is based on a modified version of the Sea Launch model. Obviously, this has its advantages – the system is



SES AMERICOM announces AMC-14 launch anomaly

SES AMERICOM has confirmed that its AMC-14 satellite failed to reach its intended orbit following its launch on board a Russian Proton Breeze-M launch vehicle on March 15. An anomaly during the second burn of the fourth stage of the rocket resulted in the satellite being placed short of the planned geostationary transfer orbit.

"While we are not in a position to comment on the possible causes of this launch anomaly, the satellite is healthy and is operating nominally in a stable orbit under the control of Lockheed Martin. SES and Lockheed Martin engineers are currently exploring various options for bringing AMC-14 into its proper geostationary orbit," said Martin Halliwell, President of SES ENGINEERING.

AMC-14 was built by Lockheed Martin Commercial Space Systems, with launch services from the Baikonur Cosmodrome in Kazakhstan provided by ILS (International Launch Services).

In all of the various scenarios to redirect the spacecraft, onboard fuel will have to be used to propel the satellite to its correct orbital position, thereby reducing its service life. SES' investment in AMC-14 is insured for partial and total loss.

The spacecraft is entirely contracted by EchoStar Corporation and is intended to operate at the orbital position of 61.5 degrees West.

"We are confident that the engineering teams at Lockheed Martin and SES will find a way to place AMC-14 into the correct orbit in a manner that our customer's requirements can be met," said Edward Horowitz, President and CEO of SES AMERICOM. "We cannot, at this time, speculate on the impact of the orbit raising activities on both the in-service date and the service life of AMC-14. We will provide additional information in due time."

proven, it is reliable and dedicated to geosynchronous transfer orbit launch with no co-passengers, it comes as a package with US interface and Sea Launch quality control, can facilitate schedule assurance, is easy to insure and has the vast experience of the Sea Launch team behind it.

About Zenit

Considered to be one of the most successful launch vehicles, the Zenit can lift off from land or sea. In fact, there is no other launch vehicle that is as simple to install and launch. The other distinct advantage that the Zenit offers is that it uses non-toxic liquid oxygen and kerosene as propellant.

The prime contractor of the Zenit is Yuzhnoye Design Bureau and the launch pad designer is the Design Bureau of Transport Machinery (KBTM). They both ensure that launcher installation, pre-launch verification, connections with ground segment and removal from the launch pad can be carried out automatically. The two main versions of the rocket are the Zenit-2 and the Zenit-3.

Yuzhnoye builds the rocket and Energia manufactures the Upper stage. Once ready, these two elements are encapsulated into a Boeing-made storage container and shipped to California for integration and testing.

Land Launch selected by Intelsat

In an agreement signed with Intelsat in January, Sea Launch will deliver two communications satellites built by Orbital Sciences Corporation to Geosynchronous Transfer Orbit. These Land Launch missions are currently planned for 2009 and serve to re-purpose manifest slots previously planned for two other Intelsat spacecraft.

The Intelsat 15 (IS-15) satellite will replace Intelsat 709 currently positioned at 85 degrees East longitude. The high power Ku-band payload will provide video and data services for the Middle East,

Indian Ocean regions and Russia. Based on Orbital's STAR spacecraft bus, IS-15 will produce 4.6 kW of power and feature two 2.3m dual-grid deployable reflectors as well as one 1.4m dual-grid deck-mount antenna.

The Intelsat 16 (IS-16) will provide Direct-To-Home (DTH) transponder capacity for DIRECTV subsidiaries. IS-16 will provide in-orbit back-up and additional transponder capacity for both Brazil and Mexico. The payload is designed to provide 24 Ku-band transponders over Brazil for Sky Brasil at 43.1 degrees West Longitude or capacity coverage over Mexico and Gulf of Mexico regions at 58 degrees West Longitude.

"We are very pleased to be able to re-negotiate these manifest slots with Intelsat, further reflecting our strong relationship with them. Intelsat continues to demonstrate their confidence in our Land Launch services and in our team", said a spokesperson for Sea Launch.

Land Launch has a busy 2008 lined up and expects 3 launches to be carried out. In the Spring, the AMOS-3 will be launched and then in the third quarter, MEASAT 1A is slated for orbit. A third, and as yet unconfirmed launch, will take place in the fourth quarter.

ILS

International Launch Services currently have a backlog of 21 Proton launches and 29 customers worldwide.



Arianespace successfully launched the European Space Agency's first ATV. Photo courtesy of Arianespace.



In February, the company announced a contract for the launch of two SIRIUS Satellite Radio satellites on the Proton Breeze M vehicle AT satellite 2008 in Washington, DC.

SIRIUS expects to launch SIRIUS FM-6 under the contract announced in Washing DC. SIRIUS FM-6 is currently under construction at Space Systems/Loral and is anticipated to be launched in the fourth quarter of 2010. SIRIUS has not announced plans as yet to utilise the second launch announced.

The Proton booster and the Breeze M upper stage are built by ILS' Russian partner, Khrunichev Space Centre of Moscow. The Proton vehicle launches from the Baikonur Cosmodrome in Kazakhstan.

"We thank SIRIUS for selecting Proton, and for its long-term relationship with ILS," said ILS President Frank McKenna. "We launched SIRIUS' initial constellation of three satellites in 2000. Proton has the ideal performance for SIRIUS, with both its heavy-lift capability and its flexibility to carry spacecraft to various orbits."

Also announced during Satellite 2008 was an ILS contract with S2M, a provider of media-rich, mobile entertainment to the Middle East and North Africa, to use a Proton Breeze M vehicle to launch the first dedicated mobile television satellite for the MENA region. ILS has exclusive rights to market the Proton rocket worldwide to commercial satellite operators.

"It is exciting to see the growth of both satellite-delivered mobile entertainment and of S2M," said ILS President Frank McKenna. "We are confident that Proton, with its performance capability and schedule assurance, will enable the S2M business to succeed in meeting the demands for these new mobile services."

The satellite will be based on Space Systems/ Loral's flight-proven 1300 platform. It will have a maximum launch mass of nearly six metric tons and a lifespan of more than 15 years, and will deliver 20kW of power. The satellite's primary S-band payload, in conjunction with a terrestrial digital broadcasting network, will provide high-quality video and audio broadcasts via mobile phones and other personal mobile devices throughout the region.

"Our company will be implementing its service within the MENA region this year," said Mario Hoek, Director of Marketing of S2M. "The satellite is instrumental to our expansion plans and one of many steps in defining S2M as the leading provider of media-rich, mobile entertainment to customers in the Middle East and North Africa. We have confidence that ILS and the Proton will deliver the performance we require to have the satellite in place to ensure continuous mobile entertainment service."

Arianespace

On Sunday, March 9, in its first mission of the year, Arianespace successfully launched the European Space Agency's first ATV (Automated Transfer Vehicle), dubbed Jules Verne, towards its rendezvous with the International Space Station.

With 23 successful launches in a row, Ariane 5 continues to prove its reliability and availability. It also set a new payload record, boosting nearly 20 metric tons into low Earth orbit on this mission.

The new Ariane 5 ES version was used for the Jules Verne ATV mission. Its lower composite, including the cryogenic main stage and solid boosters, is identical to that on the Ariane 5 ECA launcher, while the upper composite features a storable-propellant upper stage that can be re-ignited in flight.

Arianespace will use this version of the launcher for subsequent ATV missions and, if applicable, satellites in the Galileo constellation.

This launch marks Arianespace's first mission to the International Space Station (ISS). The Guiana Space Centre thus joins the very select club of launch sites serving the ISS, along with Baikonur and the Kennedy Space Centre at Cape Canaveral.

Coming just a few weeks after the docking of the Columbus space laboratory to the Space Station, the successful launch of the Jules Verne ATV shows once again that Europe plays a major role in manned space missions.

The first ATV

Jules Verne is the first ATV, a series of autonomous spaceships designed to re-supply the ISS. During the coming weeks it will rendezvous with and eventually dock with the ISS to deliver cargo, propellant, water and oxygen to the orbital outpost.

The unusual launch trajectory required the deployment of two new telemetry tracking stations, one on a ship in the Atlantic Ocean and one on the Azores Islands. The Ariane 5 upper stage performed an initial 8-minute burn over the Atlantic and entered a 45-minute coast phase, flying over Europe and Asia before reigniting for a 40-second circularisation burn over Australia. Separation of Jules Verne ATV occurred at 06:09 CET (02:09 local) and was monitored by a ground station located in New Zealand.

Jules Verne ATV is now circling the Earth in the same orbital plane as the ISS but at an altitude of only 260 km, compared to 345 km for the Station. The vehicle is under constant monitoring by the dedicated ATV Control Centre in Toulouse, France.

Located within the premises of the French Space Agency CNES, the ATV Control Centre will ensure flight control throughout the mission in coordination with the ISS mission control centres in Moscow and Houston. After having demonstrated safety manoeuvres in free flight, the ATV will perform orbital 'phasing' manoeuvres in order to rendezvous with the ISS for a first docking slot scheduled for 3 April after the departure of NASA's Space Shuttle Endeavour.

The Jules Verne ATV is the largest and most sophisticated spacecraft ever developed in Europe, combining the functions of an autonomous free-flying platform, a manoeuvrable space vehicle and a space station module. About 10 m high with a diameter of 4.5 m, it weighed 19,357 kg at launch. It incorporates a 45-m³ pressurised module, derived from the Columbus pressure shell, and a Russian-built docking system, similar to those used on Soyuz manned ferries and on the Progress re-supply ship. About three times larger than its Russian counterpart, it can also deliver about three times more cargo.

The ATV is also the very first spacecraft in the world designed to conduct automated docking in full compliance with the very tight safety constraints imposed by human spaceflight operations. It features high accuracy navigation systems and a flight software far more complex than that used on Ariane 5.

Another busy year

For Sea Launch, Land Launch, ILS and Arianespace, 2008, 2009 and beyond are going to be extremely busy. Their combined experience ensures that the high demand for launch slots will be met. ■



Land Launch. Photo courtesy of TsENKI.