



Confederation of
Indian Industry



Indian Space Research
Organisation



Antrix Corporation
Limited

Knowledge Associate

Deloitte.

WORLD SPACE-BIZ 2010

25-28 August, 2010: BIEC, Bengaluru, India

PROGRAMME OUTLINE

<u>DAY I</u>	
<u>25 August 2010</u>	
0830 – 0945 Hrs	: Registration
1000 – 1030 Hrs	Inaugural Session
<p>The early era of space exploration was driven by a "Space Race" between the Soviet Union and the United States. Common rationales, today, for exploring space include advancing scientific research, uniting different nations, ensuring the future survival of humanity and developing military and strategic advantages against other countries. Various criticisms of space exploration are sometimes made.</p> <p>During the 1970s, focus shifted from one-off flights to renewable hardware, such as the Space Shuttle program, and from competition to cooperation as with the International Space Station.</p> <p>From the 1990s onwards, private interests began promoting space tourism and then private space exploration of the Moon.</p> <p>In the 2000s, major economies are planning manned space missions for the 21st century.</p> <p>Over the last four decades, India has achieved a notable progress in the design, development and operations of space systems as well as using them for vital services like telecommunication, television broadcasting, meteorology, disaster warning as well as natural resources survey and management.</p> <p>India has made major strides in space research, development and its application for the socio-economic benefits. The main focus of the Bengaluru Space Expo 2010 is to showcase the latest technological advances, related products and technical services. It will provide a platform for space agencies, specialists, entrepreneurs and space industry leaders to share their products and their visions to Indian decision makers.</p> <p>The Exhibition will facilitate joint ventures, technology transfer, and marketing arrangements. It will also provide opportunities to network with the "Who's Who of Space Industry" from all over the world. The Exhibition will also showcase India's achievements and that of Asia and prospects for space sector.</p> <p>This session will include the evolution of the current Space Age, achievement of ISRO and its potential. It will also talk about various opportunities and potential risks in this sector.</p>	

1030 – 1130 Hrs	:	Leaders Forum on Space
<p>Despite the recent economic situations, the space industry remains robust because of the essential benefits that it provides. We see this in the US's recent decision to emphasize commercial resupply of the International Space Station and the reallocation of fiscal resources from Space Shuttle/manned space to earth observations and exploration. Some of the other economies have stable or increasing space budgets ranging from 0.05% to 0.2% of GDP. Space programs have aspirational and motivational values attached apart from the revenue generated from development and execution of space projects. The returns more than justify utilizing tax payers' money in funding these projects. Manned Space Programs are now generating significant interest apart from other surveillance, monitoring and forecasting projects all over the world.</p> <p>As regards involvement of Indian space industry, it has made significant contribution towards realization of subsystems required for Indian Space programme and continues to do so. International cooperation is an integral part of space activities and ISRO continues to lay importance on bilateral and multilateral relations with international space agencies and space related bodies with the aim of taking up new scientific and technological challenges, building and strengthening existing ties between countries.</p> <p>The Government has allocated expenditure budget of USD 1.26 billion for financial year 2010-11, which is increased by about 22% from the previous year.</p> <p>This sessions talks about the motivations aspect of space programs and cost benefit analysis of space programs.</p>		
1130 – 1300 Hrs	:	Inauguration of Bengaluru Space Expo 2010 (Exhibition Ribbon Cutting, Walk around the exhibition).
1300 – 1400		Lunch Break
1400 - 1530 Hrs	:	Session I: Access to Space
<p>Since Yuri Gagarin's flight in 1961, citizens of 38 countries, including India, have flown in space. To date, most of the individuals have been astronauts/cosmonauts, military personnel and scientists who have been extensively and expensively trained. This will continue, but we will see the emergence of "space tourism" with access to space for private individuals. The first "space tourist" was Dennis Tito who reportedly paid \$20 million (US) to ride on a Russian Soyuz spacecraft to/from the International Space Station where he spent a week. Since this epochal event, there have been seven additional space tourists who have travelled to/from the ISS on Soyuz spacecraft.</p> <p>Space tourism is today where air travel was in the early decades of the century. The high cost of Space Access prompts improvement in power and propulsion technology to reduce the cost of space missions. It is projected that sub-orbital space tourism will be economically viable, and several companies have proposed vehicles for suborbital flights to altitudes of 100 – 160 km.</p> <p>This session will include discussion on the current and potential access to space and what it means to a common man.</p>		
1530 – 1600 Hrs	:	Tea / Coffee Break

1600 - 1730 Hrs	:	Session II: Commercialisation of Space: Communication Broadcasting, Navigation Applications and Services
<p>Satellite communications includes satellite services, transponder leasing, ground equipment manufacturing, and satellite manufacturing. The satellite services segment of the industry contains rapidly growing, direct-to-consumer content including direct-to-home television, direct radio, wireless telephones, and data services. It is currently the most important and the most dynamic market for space applications. It also includes fixed telecommunications services (voice, data, internet, multimedia); broadcasting (TV and radio services, video services, internet content); mobile services (data, voice, internet, multimedia, digital radio). Originally conceived with limited coverage and to serve a limited number of professional users, satellite communication systems are evolving towards large regional or global coverage. The overall satellite communication industry has benefited significantly by the global deregulation of telecommunications markets.</p> <p>Satellite navigation systems are also a rapidly expanding industry. The implementation of GPS has allowed the development of a growing number of applications (air transport, maritime transport, land transport, localisation of isolated individuals) and provides as well a universal referential time and location standard for a number of systems. Satellite based Positioning, Navigation and Timing (PNT) service is of vital importance to economies and societies. It is emerging as an important space application area not only for civil aviation but in many other areas such as mobile telephones, surface transport, intelligent highway system, maritime transport, rail, oil and gas, precision agriculture, fisheries, survey and marine engineering, science, electricity networks and leisure. The commercial GPS market continues to grow with the introduction of new receivers that integrated the GPS function into other devices such as cell phones, thus making it a mainstream electronic application.</p> <p>This session will include discussion on the growing opportunity globally in the sector and the market strategy of companies to tap the market.</p>		
1930 – 2130 Hrs		Reception & Dinner
2130 Hrs	:	End of Day 1

DAY II
26 August 2010

1000 – 1130 Hrs

:

Session III: Commercialisation of Space – Remote Sensing Systems, Applications and Value Addition

Remote sensing products and services provide a unique perspective of the Earth, its land masses, nations, and communities. The key component of the remote-sensing category is satellite imaging systems although the segment also includes aerial imaging and geographical information systems. More than 80% of commercial remote sensing data is produced and purchased by governments with national security as the primary application.

Companies and governments operate remote sensing satellites, and a wide range of private companies analyze and integrate imagery with other information such as road maps, store locations, pollution maps, census data, and crime statistics. Demand for imagery is driven by an increasing mix of military, civil government, and consumer interests. Current military operations drive continual government demand for satellite imagery to address national security and intelligence gathering concerns.

One of the major issues is the distribution of low-price or free images from public imaging systems in direct competition with commercial providers. The ownership of imaging rights is a further area of controversy. Yet, despite these complications imaging by remote-sensing satellites and geographical information software are expected to be growth sectors.

This session will feature the growing demand of remote sensing system, its application and the opportunity, which the companies are looking for in this market.

1130 – 1200 Hrs

:

Tea / Coffee break

1200 – 1330 Hrs

:

Session IV: Role of Small Satellites and future prospects

Small satellites have the potential to transform the space business in a way that personal computers changed the computing industry in the 1990s. With their power and flexibility, small satellites will soon make space technology more accessible for a larger and diverse number of users.

Small satellites are gaining more importance these days in every country. It not only being cost-effective but also takes less time to build. Small-satellites can be custom-built for specific and narrowly-focused objectives. Flexibility is their hallmark. The ease of their launch makes them especially relevant to time-urgent missions like dealing with natural disasters.

Small satellite can replace larger satellites going forward. In India, ISRO has launched many small satellites mainly for the experimental purposes like remote sensing, atmospheric studies, payload development, orbit controls, recovery technology etc.

The future prospects of the small satellites are bright and the possibility cannot be ruled out that more and more experiments would be done to reduce the weight and size of satellites in future and different countries would join together to make small satellite mission successful. This may provide a huge opportunity to the private sector to develop these small satellites jointly with ISRO.

This session will feature importance of small satellite, role of ISRO, ESA, NASA and others in the same and how the companies are looking opportunity in this market.

1330 – 1430 Hrs

:

Lunch

1430 – 1600 Hrs	Session V: Forum of Vendors and Suppliers for Space and Ground Systems
<p>There are commercial communication satellites in orbit delivering a range of services including international and intercontinental telecommunications, TV broadcasting and distribution, Direct-To-Home TV, VSAT networks and broadband data communications. Growth in space commerce could lead to greater competitions for scarce space resources such as orbital slots and radio frequencies. Commercial space includes development of Spacecrafts, Satellites, Space Colonisation and Militarization. Though government funded agencies still dominate R&D and new application areas, many specialised vendors assist these programmes through their high quality and highly intensive skill and knowledge base. Production is primarily in the hands of the private sector. The Indian space sector also includes vendors from all over the world – big and small. Evolving globalization trends and cost cutting pressures are shaping up M&A activities.</p> <p>The session will feature importance of various ground and space systems, capabilities required, differences and the risks involved in executing them, current running models and emerging collaborative models for operating in the space sector.</p>	
1600- 1630 Hrs	Tea / Coffee break
1630 - 1800Hrs	B-to-B Meetings
End of Day II	

DAY III
27 August 2010

1000 – 1130 Hrs

: Session VI: Risk Management for Space Ventures

Space ventures promise an evolving sector with huge returns. But the execution risks are too high. Risk elements involved in space sector are related to technological, industrial, commercial, financial, legal / legislative and in particular insurance. The time is ripe to share the risk/returns with other stakeholders who wish to enter Space Business including Venture Capital, insurance companies, individuals etc. We may discover new models on the way.

This sessions talks about risks involved in space programs, risk mitigation strategies and role of private participation/venture capital in funding the projects

1130 – 1200 Hrs

: Tea / Coffee break

1200 – 1330 Hrs

: Session VII: Doing Business with ISRO: Opportunities/ Procedures

Space holds immense potential to accelerate the development process in the countries and offers enormous opportunities to understand the universe. The thrust of the space programme in future for India is to have large scale applications of space technology in the priority areas in the context of national development. Space industry is inherently technology intensive and is dependent on long term research & development for its future viability.

International cooperation is an integral part of space activities, and ISRO continues to lay importance on multilateral relations with space agencies. The aim is to take up new scientific and technological challenges, define international frameworks for exploitation and utilisation of outer space for peaceful purposes, refine space policies and strengthen existing ties between countries. ISRO also takes great interest in providing expertise available at its centres for helping other developing countries in the applications of space technology.

ISRO entered into certain agreement with following countries/agencies:-

- Government of the Republic of India and the Government of His Majesty the Sultan and Yang di-pertuan of Brunei Darussalam - On cooperation in the operation of telemetry tracking and telecommand station for satellite and launch vehicles and for cooperation in the field of space research, science and applications;
- Framework Agreement between the Government of the Republic of India and the Government of the French Republic - On cooperation in the Peaceful Uses of Outer Space;
- Agreement between the Japan Aerospace Exploration Agency and the ISRO - Concerning cooperation in JAXA/SELENE project and ISRO/Chandrayaan-1 project; and
- Memorandum of Understanding between the ISRO and the Agenzia Spaziale Italiana - Cooperation in flying ROSA instrument on Megha-Tropiques satellite.

The tenth five year plan for Indian Space Programme witnessed remarkable initiatives and programme on international co-operation with countries including France, USA, Europe, Israel, Canada. Indian Lunar Mission Chandrayaan-1 carrying scientific instruments from USA, Europe and Bulgaria.

With these and many other co-operative initiatives with other countries, the International cooperation of India in Space has become far stronger and important.

The thrust of International co-operation during the eleventh five year plan will be to continue and further strengthen the ongoing relations with various space agencies. Co-operative programmes in Space science, environment, meteorology, earth science, space education & training services will be pursued with International Agencies. The support for UN will be pursued further.

Opportunities in the area of doing business with ISRO are in the area of developing capabilities in Space Communications and Navigation, leadership in Earth Observations, Space transportation system and in Space Science enterprise.

Many Space organisation of different countries, with annual budgets of the range of USD 1-5 billion dollars, have already entered or are looking forward to enter into the partnership with ISRO. Some of the agencies are as follows:

- **National Aeronautics and Space Administration (NASA)** – The US space agency located in Washington DC has an annual budget of approximately USD 18 billion. It is responsible for the nation's civilian space program and is supporting the International Space Station.
- **European Space Agency (ESA)** – ESA headquarters are located in Paris and is an intergovernmental organisation dedicated to the exploration of space.
- **Centre National d'Etudes Spatiales (CNES)** – It's headquarters are located in central Paris and it's placed under the supervision of the French Ministries of Defence and Research. It operates out of the Centre Spatial Guyanais, but also has payloads launched from other space centres operated by other countries. ISRO is currently working on Oceanography Studies jointly with CNES.
- **Russian Federal Space Agency (RKA)** – RKA is the government agency responsible for the Russian space science program and general aerospace research. ISRO is currently working on a Satellite Navigation Program jointly with RKA.
- **Agenzia Spaziale Italiana (ASI)** – ASI headquarter are located in Rome and is operating under the Ministry of the Universities and Scientific and Technological Research, the Agency cooperates with numerous international and Italian entities, who are active in space technology, and with the Italian President of the Council of Ministers.
- **Canadian Space Agency (CSA)** – CSA headquarter are located in Quebec and is the Canadian government space agency responsible for Canada's space program.
- **Deutsches Zentrum fur Luft-und Raumfahrt (DLR)** – DLR headquarter are located in Köln-Porz and is the national centre for aerospace, energy and transportation research of the Federal Republic of Germany. It is engaged in a wide range of research and development projects in national and international partnerships.
- **Japan Aerospace Exploration Agency (JAXA)** - JAXA headquarter are located in Tokyo and is responsible for research, development and launch of satellites into orbit, and is fundamentally involved in many missions such as asteroid exploration and a possible human mission to the Moon.

This session will feature ISRO goals in strengthening India's position in International Space Market and the opportunities of doing business with ISRO by various International Space Agencies and private players.

1330 –1430 Hrs	:	Lunch
1430 - 1600 Hrs		Valedictory Session
1630-1800 Hrs		B-to-B Meetings
DAY IV: 28 August 2010; Full Day Reserve for B-to-B Meetings		