Mobile Personal Communication Satellite System Project

Presentation material

Summary of the project

Purpose

- Obtaining the significant part of revenues from subscribers across the states of Shanghai Cooperation Organization (population of more than 3 billion people) by providing them services of mobile personal satellite communication with outside of the US technology zone software and hardware programs.

Benefits for the shareholders

- Creating a high-margin business in the telecommunications industry;
- Implementation of large joint Russian-Chinese project;
- Implementation of important project for the Shanghai Cooperation Organization's countries allows subscribers gain mobile satellite communication that will significantly increase the privacy and convenience of negotiations as well as the range of potential users of the system
- Building up the competences and organization of highly qualified team capable to implement international high-tech projects
- Revenue growth and capacity utilization of the Russian and Chinese enterprises due to the production of space systems elements and subscriber equipment.

Financial results

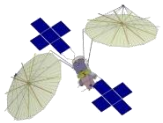
- The authorized capital of the joint venture operator- $ 5 m.
- Debt financing- $480 m.
- Key figures of the project until 2035 year (satellite operational period):
  - **Revenue - $11,36 b.**
  - **OIBDA - $6,72 b.**
  - **Net income - $5 b.**

Investment results

- NPV - $0,31 b., IRR – 33%, DPBP – 9,5 years.

Mobile satellite communication project on the territory of SCO members states is attractive for investors

Objectives and conditions for the deployment of MPCSS



Implementation of the project will provide:

- Mobile satellite communications systems in the Eurasian region;
- Reliable and confidential communication for government and commercial companies throughout the system service area;
- Opportunity to concentrate guaranteed communication resource in the specified regions (areas) for subscribers of field services of the ministries and departments;
- Telephone penetration of territories underserved by telecommunications services and providing them in sparsely populated areas;
- technological breakthrough in the production of ultra-high power available spacecrafts;
- Return on investment due to revenues from the subscribers in the states of the Shanghai Cooperation Organization.

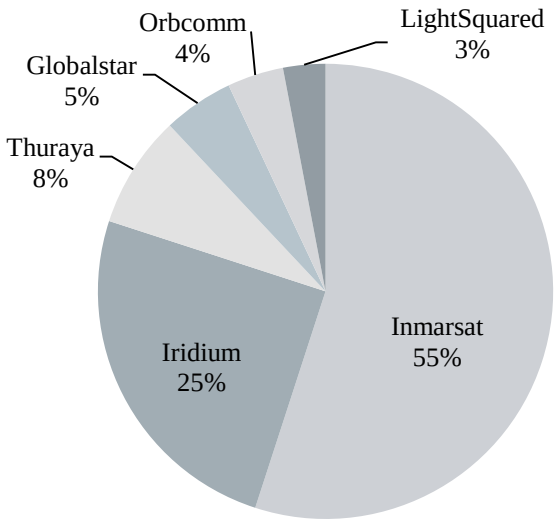
Conditions for realization:

- The presence of orbital and frequency resources to deploy MPCSS in geostationary orbit.
- Political will and support from the SCO member and effective international cooperation

The project implementation will allow to solve a wide range of important government and economic problems, as well as receive a significant return on investment

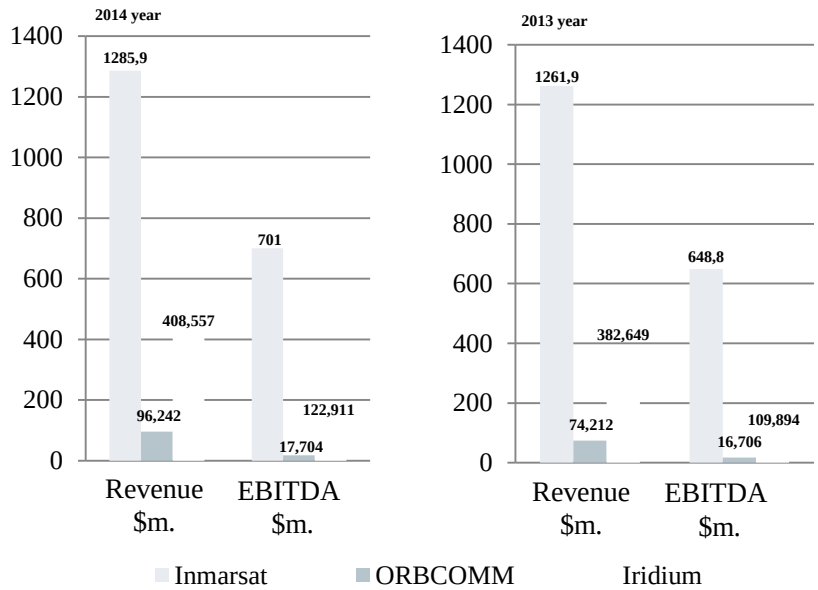
Competitive environment

Shares in the world's largest players in the market



source : Euroconsult

Financial results



- **Inmarsat -** the largest portfolio of products, incl. all the major markets and the use of MSS. (Tech. US zone)
- **Iridium –** covers the polar zone (Tech. US zone)
- **Thuraya –** operates in Middle East, Africa, Europe, Asia and use handheld MSS phones in general (Tech. US zone)
- **Orbcomm –** low-speed terminals for tracking, remote monitoring, telemetry (Tech. US zone)
- **LightSquared** – operates in North America and part of South America (Tech. US zone)
- **MPCSS** – MSS in Eurasian region with a potential global expansion

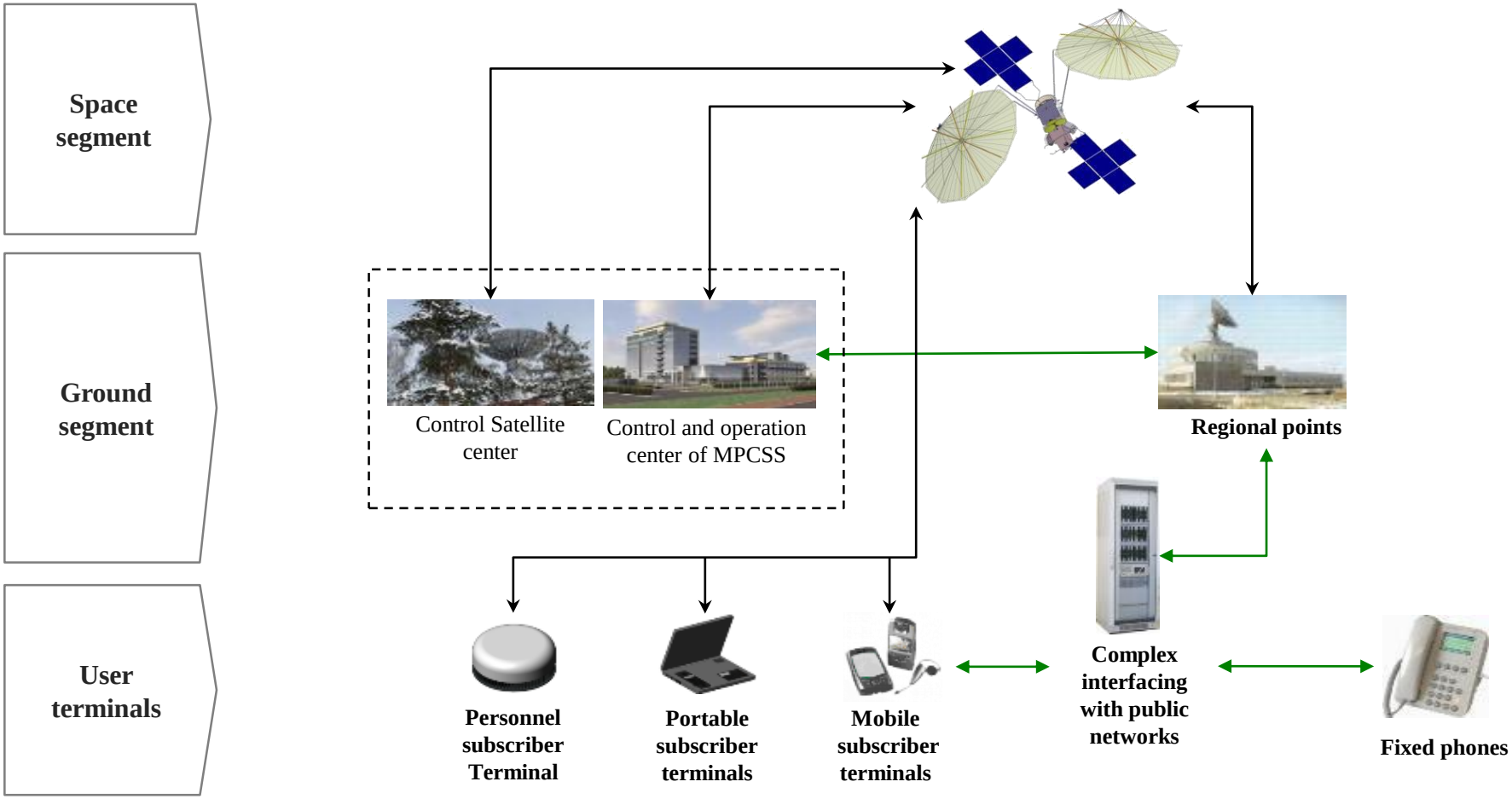
Matrix of mobile satellite communications operators services

Company	Pocket terminals	Terrestrial fixed (transportable) terminals	M2M / Support facilities	Broadband terminals	Marine terminals	Air terminals
Inmarsat	✓	✓	✓	✓	✓	✓
Iridium	✓	✓	✓	✓	✓	✓
Thuraya	✓	✓	✓	✓	✓	✓
Globalstar	✓	✓	✓		✓	
Orbcomm	✓		✓			
LightSquared	✓	✓	✓			
MPSCS	✓	✓	✓	✓	✓	✓

Today, 100% of MSS systems are manufactured in the US or working on the US technological base. MPCSS will be the first technology-independent regional satellite communication system.

The architecture of MPCSS creation

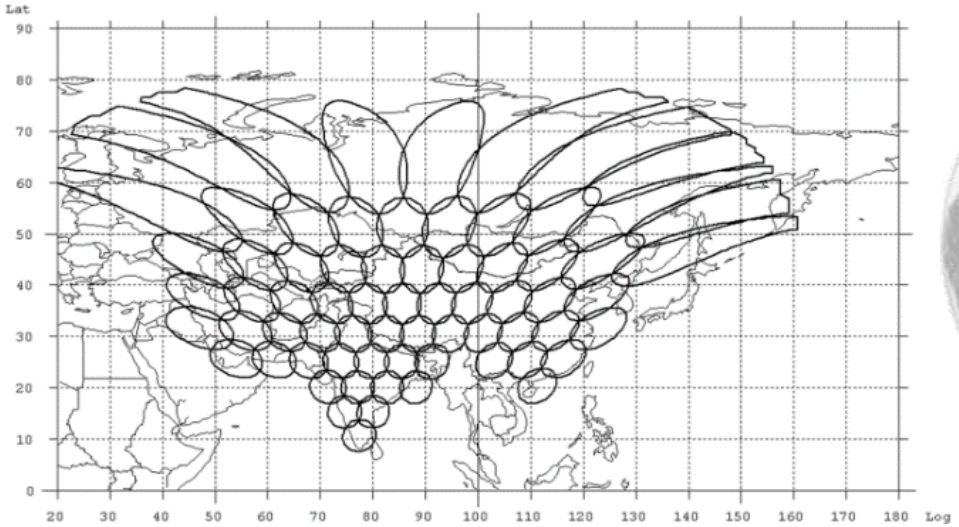
Mobile Personal Satellite Communication System (MPCSS)



The three-level architecture allows to reduce the time of putting the system into operation due to the solve the problems by parallel and geographically dispersed

The MPCSS service area

The underlying allocation of rays over the surface*



* The exact allocation is studied within the framework of the system project

The geography of Users

Member States of the SCO:

Population – 2988,5m. people including:

- India - 1 236 m. people
- Kazakhstan – 17,9 m. people
- Kyrgyzstan – 5,6 m. people
- China – 1 355 m. people
- Russia - 142 m. people
- Pakistan - 196 m. people.
- Tajikistan – 8 m. people
- Uzbekistan – 28 m. people

Observer States of the SCO:

Population – 125 m. people including:

- Afganistan – 31,8 m. people
- Belirussia – 9,5 m. people
- Iran – 80,8 m. people
- Mongolya – 2,9 m. people

- The population of territories in service **– 3+ billion people**
- Concurrent communication channels – 10 000
- The maximum **number of Users – 1,5 million**
- The basic rate assumes two levels of profitability:
  - **High-margin users** - users of encrypted secure connection service (ARPU = **$3 900 per year**).
  - **Low-margin users** – users of standard connection service (ARPU = **$540 per year**)

Focus on the Eurasian region and customer segmentation at the margin of profitability will allow to load the System with maximum economic efficiency.

The Project Stages and base activities

Stage: JV creation (year 2016)

- Joint venture in the jurisdiction of the PRC or another with **the distribution of Shares**
- JV – **the Customer and Operator** of Mobile Personal Satellite Communication System
- Gets the permission to use the orbital-frequency resource

Stage: System design (year 2016)

Joint venture:

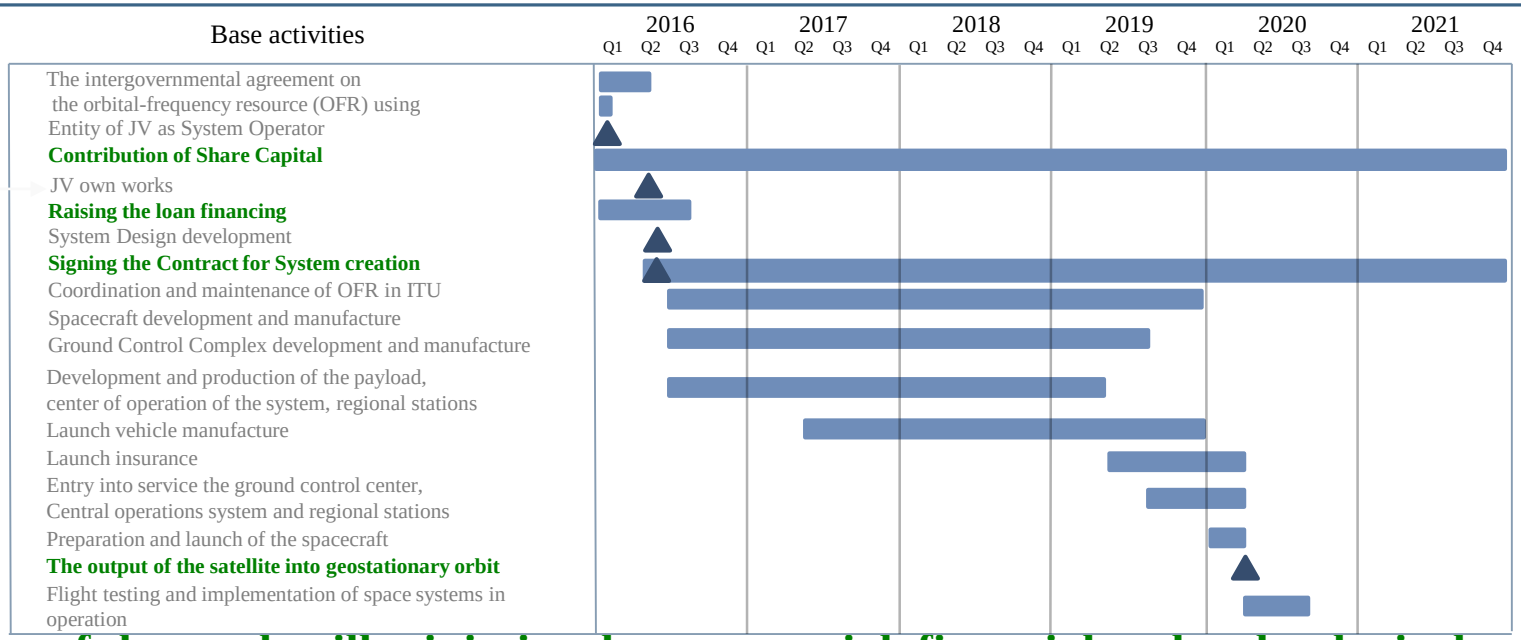
- develops Technical requirements for System design;
- Sign the contracts for the development of the System design.

Stage: System creation and operation (years 2016-2034)

Joint venture :

- determines contractors subsystems in accordance with a three-level system architecture;
- attracts **staged financing** under the guarantees of the Shareholders of the Joint Venture;
- orders creation and launch of MPCSS, providing an unified system and technology approach;
- c 2020 performs as the System operator for the whole territory of countries-members of the Shanghai cooperation organization with further scaling in Africa and South America contrives from year 2020;
- **provides maintenance and upgrades of the System.**

Base activities (years 2016-2021)



The phase structuring of the work will minimize the managerial, financial and technological risks of the project and to optimize the time of its implementation

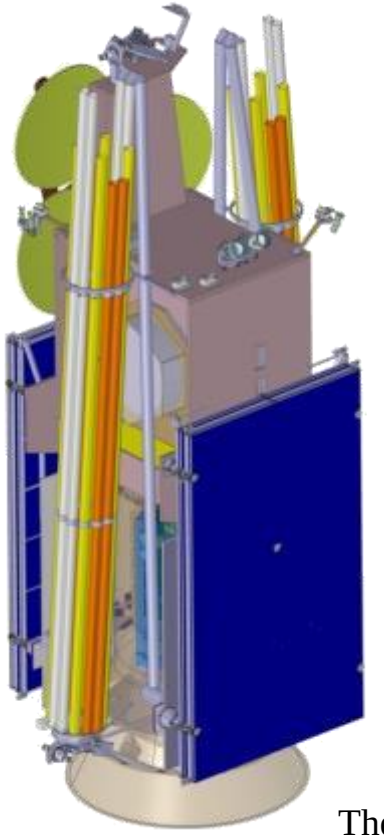
Conclusions

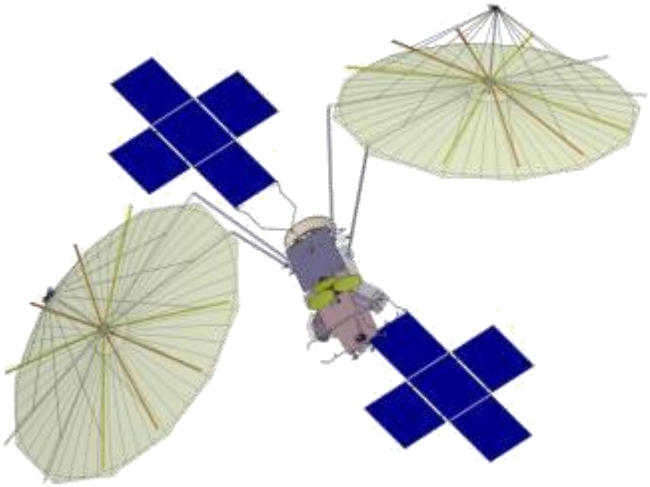
- Implementation of Mobile Personal Communication Satellite System project will allow to:
  - fill up a range of communication services in Russia, the People's Republic of China and the territories of SCO countries with mobile satellite services;
  - establish a new high-margin business;
  - provide continuous communication services to governmental and public organizations;
  - ensure telephone connection for the territories which are insufficiently covered by communication services;
  - provide low populated areas where development of mobile and landline networks is economically inexpedient with mobile and fixed telephony services;
- Step-by-step creation of MPCSS based on the existing solutions of satellite bus “Express2000” will allow in the shortest possible time with minimum risks to create and develop system and to begin rendering communication services
- Proposed financial model based on the co-investment principle assumes a considerable dividend flow at admissible risk level
- Operator of personal satellite communication services will take leading positions in the world market
- Successful project implementation requires decision on orbital and frequency assignment in favour for Joint venture – MPCSS operator

Annex

Satellite specifications

Designed heavy class satellite will transfer Russian satellite high-energy buses to the new technological level





Satellite parameters and specifications:

- Satellite services life-time - 15 year on orbit
- Satellite equipped with two hybrid mirror antennas with 13-15 m diameter reflectors
- Liftoff satellite mass not more than 3200 kg
- Satellite power supply system capacity 20 кВт
- Frequency range for user lines: S

There is one Geostationary Satellite in orbital constellation at initial phase. Decision on increasing of satellites in the system will be taken on first satellite flight test results.

Satellite is creating based on the existing flight-tested solutions of satellite bus “Express2000” designed by JSC ISS

Subscriber equipment

Equipment type	Description
• Stationary and mobile terminals 	• Narrow-band voice communication and data transmission. Present equipment consists of mobile and vehicle installed terminals which can be used in all MSS segments. Stationary terminals are usually installed on the ships, airplanes and vehicles and provide communication "in movement". Transportable or "mobile" devices are also used at narrow-band ground mobile terminals market . The amount of transportable narrow-band terminals for voice communication and data transmission gradually decreases as they are forced out by either broadband, or pocket terminals;
• Handled (pocket) satellite phones 	• MSS pocket phones are similar to cell phones, but a little exceed them by the sizes and antennas length. New satellites with increased power signal allow to use less dimensional terminals with a large number of functions.
• Broadband MSS terminals 	• Terminals of the laptop PC size with data transmission rate of 128-492 Kb/s for high speed Internet access in movement. The MSS broadband terminals are used for e-mail, network access and standard navigation on the Internet, and also for more perspective applications for end users, for example, streaming in real time;
• M2M terminals 	• M2M terminals ("machine-to-machine") are used for low-speed applications to escort objects, telemetry or dispatching management and data collection (SCADA) by devices installed on containers, transport, pipelines and other stationary or mobile objects. M2M terminals are usually cheaper than MSS terminals of other types, and they require small part of satellite capacity because of the small sizes of the transferred messages.

MPCSS proposed user terminals for land-, maritime and aviation use allowing to attract B2G, B2B and B2C subscribers

Any additional information may be provided upon written request to all concerned

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