Currently most of Russia’s territory is not covered by GSM/GPRS-standard communication networks.
In Russia there are problems with transferring GLONASS data from users to control and monitoring centers in areas outside terrestrial GSM/GPRS networks coverage, and also with other types of communication in such areas for mobile subscribers across the country, including water areas.

International experience: USA provide a global communication space for Navstar GPS system through 3 MSS systems - Iridium, Globalstar and Orbcomm.

*SC – space craft  *MSS – mobile satellite system
### Use of Foreign Mobile Satellite Systems and Related Risks

<table>
<thead>
<tr>
<th>Mobile satellite systems</th>
<th>State-owner</th>
<th>Orbit group (number of SC)</th>
<th>Coverage area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iridium</td>
<td>The USA</td>
<td>66 low-orbit</td>
<td>Global</td>
</tr>
<tr>
<td>Inmarsat</td>
<td>The UK</td>
<td>11 geostationary</td>
<td>up to 70°</td>
</tr>
<tr>
<td>Globalstar</td>
<td>The USA</td>
<td>48 low-orbit</td>
<td>up to 70°</td>
</tr>
</tbody>
</table>

**Risks, associated with use of foreign MSS:**

- All information transmitted throughout the territory of Russia via the networks of foreign MSS operators passes through servers outside Russia and is "open" to foreign operators of MSS, which may cause preconditions for violation of Russia’s info-communication sovereignty.
- Operatively-search actions requirements concerning data transferring can not be satisfied in full.
- There are risks of disconnection of subscribers for political and economic reasons.
- The beneficiaries are foreign telecom operators.
MSPSC “GONETS-D1M”

basic characteristics

- Orbit altitude: 1400 km;
- Orbit type: circular, near-polar;
- Constellation: 12 communication SC;
- Coverage area: global;
- 1 satellite footprint diameter: up to 5000 km;
- Type of communication: session, half-duplex;
- Subscriber terminal antennas: omnidirectional;
- Bitrates for users:
  - in downlink channel: up to 76.8 kbps;
  - in uplink channel: up to 9.6 kbps.
Multifunctional system for personal satellite communication “Gonets-D1M” for II quarter 2015

Radio visibility zone of 4 MSPSC “Gonets-D1M” ground stations (Moscow, Zheleznogorsk, Tiksi, Yuzhno-Sakhalinsk) provides 100% cover of Russia’s territory, including exclusive economical zone.

12 SC “Gonets-M” and 1 SC “Gonets-D1” provide worldwide communication. The satellites continuously orbit the Earth.
The GLONASS system provides positioning throughout Russia’s territory.

The “Gonets” system provides two-way transmission of GLONASS and other data to/from users throughout Russia’s territory.

RS – regional station (gateway)
Sending alarm messages from vehicles or transport infrastructure assets in emergency

Transmission of vehicle positioning data obtained by the "GLONASS" system

Transmission of vehicles and transport infrastructure telematic data from outside of the coverage of mobile networks
FORMATION OF COMPLEX MONITORING SERVICES USING "GONETS" AND GLONASS

End-to-end solution to users' tasks

- Monitoring of assets position
- Monitoring of fuel level
- Monitoring of assets state and operation
- Personal messaging with driver
- Alarm notification and messaging

Formation of complex service

Positioning and telematics information, personal and alarm messages

Enhancing efficiency, reducing operational expenses

Various types of transport means, heavy equipment, other assets

GONETS orbit group

GLONASS orbit group

Positioning information
USE OF “GONETS” AND GLONASS SYSTEMS ON THE NORTHERN SEA ROUTE

Complex use of “Gonets” and GLONASS systems on the Northern Sea Route will provide:

- Transmission of vessel positioning data, obtained via GLONASS;
- Circular messaging to pre-defined groups of users (vessels);
- Communications of vessels with public networks;
- Communications between vessels on the Route;
- Alarm messaging with GLONASS data attached;
- Communications with shore services;
- Collection and transmission of various telematics data on vessels (speed, fuel level, etc.).
USE OF “GONETS” AND GLONASS SYSTEMS IN EMERGENCIES

Tasks to resolve:
- Transmission of GLONASS positioning data from sites of emergency to rescue centers;
- Emergency notification of settlements and mobile subscribers in risk emergency-affected areas;
- Obtaining in rescue centers GLONASS positioning data of mobile groups, communications with such groups.
**IMPLEMENTATION OF “GONETS-GLONASS” SOLUTION AT THE LEVEL OF USER TERMINAL**

<table>
<thead>
<tr>
<th>Main features of Gonets 0,3-0,4 GHz subscriber terminal</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication channels</strong></td>
<td>Satellite «Gonets», GSM/GPRS</td>
</tr>
<tr>
<td><strong>Transmitter power, W</strong></td>
<td>Stationary, mobile - up to 10, portable - up to 5</td>
</tr>
<tr>
<td><strong>Types of data to send/receive</strong></td>
<td>Text information, files, images, short messages (SMS), alarm messages, GLONASS positioning data, user data packets</td>
</tr>
<tr>
<td><strong>Positioning accuracy</strong></td>
<td>Up to 10 m by GLONASS</td>
</tr>
<tr>
<td><strong>Interface for user equipment</strong></td>
<td>Mobile, stationary – RS-485 or 100Base-TX, portable – USB</td>
</tr>
<tr>
<td><strong>Weight, kg</strong></td>
<td>Depending on the terminal type and packaging a terminal set weighs 0,6 – 1,5 kg</td>
</tr>
<tr>
<td><strong>Power supply, V</strong></td>
<td>Stationary, mobile – 110/220V 50Hz AC, 12 V DC Portable 110/220V 50Hz AC, on a battery of its own</td>
</tr>
<tr>
<td><strong>Power consumption, VA</strong></td>
<td>stationary, mobile – not more than 36 VA</td>
</tr>
</tbody>
</table>
The order by Deputy Chairman of the Government Dmitriy Rogozin, of 11/19/2013 (positive responses from Russian State organizations: the Space Agency, the Ministry of Health, the Ministry of Transport, the Industry and Trade Ministry, the Ministry of Culture about possibilities to use the "Gonets" system for their needs);

Minutes of the Military-Industrial Commission meeting from 02/05/2014 (Ministry of Transport submitted proposals for the use of "Gonets" system for the operation of "ERA-GLONASS" in areas with no terrestrial network coverage);

The order of Deputy Chairman of the Government A.V. Dvorkovich № 2278 of 04/04/2014 (for adaptation of the "Gonets" communication means to the terrestrial infrastructure of Ministry of Transport);

The order of Deputy Chairman of the Government Dmitriy Rogozin № 3693 of 05/21/2014 (to the Ministry of Transport, the Ministry of Communications and the Russian Space Agency) to take an agreed decision on the use of "Gonets" for the operation of the "ERA-GLONASS" system.
The systematic development and use of the navigation-communication space “Gonets-GLONASS" will provide in the territory of Russia:

- transfer across the country positioning and other information to monitoring and data processing centers of various levels;
- opportunities to substitute the import of foreign mobile satellite communications and positioning operators services in sectors and areas of national importance for those of domestic operators;
- significant strengthening of the navigation and communication sovereignty of the Russian Federation
- secure transmission of information;
- stimulation of domestic high-tech sectors development.

Using the Russian system “Gonets" as a communication space for GLONASS data transmission ensures compliance with requirements of the Government of Russian Federation Decree of February 1, 2000 N 88, in particular:

«Foreign satellite communications and broadcasting systems shall be admitted to the telecommunications market of the Russian Federation for the organization of international relations and in some cases - for the organization in the Russian Federation of satellite communications and broadcasting in the absence of the possibility of using a similar Russian system of satellite communication and broadcasting». 
Thanks for your attention!