



CGMS-39 ROSH/ROSC -WP-04

Prepared by ROSH/ROSC
Agenda Item: C.1
Discussed in Plenary Session

FUTURE OF THE RUSSIAN POLAR-ORBITING SATELLITE SYSTEM

Summary and purpose of the WP

The polar-orbiting satellite system should consist of three hydrometeorological and oceanographical satellites. The payload of meteorological Meteor-M №2 and oceanographical Meteor-M №3 satellites as well as future Meteor-MP series satellites are described.

Action proposed: none

Future polar-orbiting meteorological satellite system

According to Russian Federal Space Program 2006-2015 the polar-orbiting satellite system should consist of three hydrometeorological and oceanographical satellites.

The Meteor-M №2 is about to be launched in 2012. The oceanographical satellite Meteor-M №3 is scheduled for 2015.

Payload of Meteor-M №2 is described below:

- Scanning radiometer MSU-MR (low-resolution multichannel scanning unit, 6 channels, VIS & IR);

- Visible spectrum scanning imager KMSS (3 cameras with 3 channels each, spatial resolution 50 and 100m);

- X-band side looking radar Severjanin (with 500 and 1000 m resolution);

- Microwave imager-sounder MTVZA-GY (module for temperature and humidity sounding of the atmosphere, 26 channels, 10.6-183 GHz);

- Infra-red Fourier-transform spectrometer IKFS-2 (IR atmospheric sounder, spectral range 5-15 μm , spectral resolution $\sim 0.5 \text{ cm}^{-1}$);

- Heliogeophysical instrument collection GGAK-M;

- Data collection system.

Meteor-M №2 has three downlink radio lines:

- 2-channel SHF-band radio link (8.192 GHz and 8.320 GHz) with 122.88 Mbps data transmission rate;

- UHF-band radio link (1.7 GHz) with 665.4 Kbps data transmission rate;

- VHF-band radio link (137 MHz) with 80 Kbps transmission rate (LRPT data transmission).

All instruments for Meteor-M №2 mission are now produced and being prepared for the installation onboard the spacecraft. The satellite is to be launched on a sun-synchronous orbit (820 km, equator crossing time $\sim 9\text{h}:30\text{min}$, inclination 98,79) in September 2012.

It is planned to launch two similar satellites with the same payload as Meteor-M №2, i.e. Meteor-M №2-1 (launch due 2015) and Meteor-M №2-2 (launch due 2016). The goal is to create a system of identical operational meteorological satellites on morning and afternoon orbits.

Oceanographical satellite Meteor-M №3 is currently at the development stage. Its payload consists of:

Multimode radar based on Active Phased Array Antenna (APAA) technology (X-band, spatial resolution from 1 to 500 m, swath 10 - 750 km);
Scatterometer (Ku-band; spatial resolution 25x25 km, swath 1800 km);

Coastal Area Scanner (4 channels, visible range, spatial resolution 80 m, swath 800 km);

Ocean Color Scanner (8 channels, visible range, spatial resolution 1 km, swath 3000 km);

Radio-occultation instrument.

Meteor-M №3 is scheduled for launch in 2015.

According to the Federal Space Program , the development of New Generation Satellite Constellation Meteor-MP has been started in 2011.

Meteor-MP satellite constellation will comprise of 3 satellites: two meteorological and one oceanographical satellite. Meteor-MP payload will be basically similar to Meteor-M series payload, but with improved performance characteristics.

Meteor-MP payload will consists of:

	Meteor-MP №1	Meteor-MP №2	Meteor-MP №3
Scanning radiometer (low-resolution multichannel scanning unit)	+	+	-
Ocean colour scanner	-	-	+
Visible spectrum scanning imager (Medium resolution multispectral imaging system)	+	+	-
Coastal area scanner	-	-	+
Infra-red Fourier-transform spectrometer	+	+	-
Medium resolution multispectral infra-red scanner	-	-	+
Atmospheric composition spectrometer	+	+	-
Microwave imager-sounder (module for temperature and humidity sounding of the atmosphere)	+	+	-
Scatterometer	-	-	+
Side-looking radar system	+	+	-
Multimode radar system based on Active Phased Array Antenna (APAA)	-	-	+



Radio-occultation instrument	+	+	-
Data collection system	+	+	+
Heliogeophysical instrument collection	+	+	-
137MHz data downlink system	+	+	+
1.7GHz data downlink system	+	+	-
X- and Ka- band data downlink system	+	+	+

The launch of the first Meteor-MP series satellite is scheduled for 2016.