



CGMS-40 CNSA-WP-01
Prepared by CNSA
Agenda Item: C.2
Discussed in Plenary

THE STATUS OF CURRENT AND FUTURE CNSA EARTH OBSERVING SYSTEM

CGMS is informed the status of Earth Observing System of current China National Space Administration (CNSA). Currently, the system is comprised of FY series satellites, HY-1B&2 satellites, HJ-1A&B satellites, ZY-3 satellites. In the future, China will keep launching several satellite systems, including FY-4, CFOSAT, CBERS 03/04, and HJ-1 C. FY-4 is scheduled to launch in 2015. CFOSAT will be launched in 2014. HJ-1C will be launched in 2012. This paper introduces the current status of CNSA's in-orbit satellite system and the status of satellites in developing.

The status of current and future CNSA Earth observing system

1 INTRODUCTION

With the development of space industry during last five decades, the technique of satellite remote sensing for the Earth observation has been extended rapidly in China. The remote sensing images and dataset have been used in diversities of applications, such as mineral and resource, land use, ecosystem control, flood and drought monitoring, et al. China will build an Earth observing system (EOS) for continuously and stably observing the Earth from the space, including FY series satellites, CBERS series satellites, HY series satellites, and environment and disaster small satellite constellation (HJ) series. Meanwhile, China is also keeping developing the ground receiving and processing system of EOS.

2 THE STATUS OF CURRENT SATELLITE SYSTEMS

Currently, there are five satellites of China National Space Administration (CNSA) EOS are operating in orbit, including FY-3A, FY-3B, HY-1B, HY-2, HJ-1A/B and ZY-3.

2.1 FY Series Satellites

FY-Series has become operational meteorological satellites and serve as one of important members of the global operational meteorological satellite system. FY-3A/B were launched successfully on May 27th 2008 and November 5th 2010, respectively. Both satellites are running stably on orbit. The detailed information can be found in documents provided by CMA .

2.2 HY Series Satellites

HY series includes ocean colour satellite (HY-1) and Ocean Dynamics environmental satellite (HY-2).

The HY-1 satellite was equipped with two payloads: ocean colour and temperature scanner and 4-band CCD imager, mainly used for monitoring ocean colour, sea surface temperature, and sea ice. HY-1A/B were launched on May 15th 2002 and April 11th2007, respectively from Taiyuan Satellite Launching Centre. HY-1A satellite stopped working on March 30th 2004. HY-1B satellite is still functional in orbit.



Ocean Dynamics environmental satellite program (HY-2), equipped with Microwave Radar Altimeter, Microwave scatter meter, and Microwave Radiometer, was mainly used to detect marine Dynamics status, including ocean surface wind, ocean surface height, the effective wave height, sea surface temperature, and other important parameters. HY-2 was successfully launched on August 16th, 2011 from Taiyuan Satellite Launching Centre. After the satellite experienced the measurement evaluation, HY-2 satellite runs well and has some typical applications. The detailed description can be seen CNSA-WP-02.

2.3 ZY Series satellites

The ZY series satellite was developed jointly by China and Brazil. Three ZY satellites, CBERS01/02/02B, were launched successfully and finished their missions after a couple of years. Their data is still used widely in different research fields.

ZY-3 is a high-resolution three-dimensional mapping satellite, which has 4 payloads whose images can be used for mapping and resources survey, such as producing 1:50000 and 1:25000 scale topographic maps. Satellite was launched on January 9th 2012 from Taiyuan Satellite Launching Centre and works normally now.

2.4 Environment and Disaster Small Satellite Constellation

The environment and disaster small satellite constellation is composed of optical satellites and microwave SAR satellites. The first stage of constellation (HJ-1 programme) includes two optical satellites and one SAR satellite, for environment monitoring, ecosystem protecting, and disaster detecting with high spatial and temporal resolutions.

HJ-1A/B were launched successfully on Sep. 6th 2008 from Taiyuan Satellite Launching Centre. HJ-1A is equipped with a CCD camera and a hyper-spectral camera while HJ-1B is equipped with a CCD camera and an IR camera. Combining two satellites, the Earth can be observed once in two days. After launched and operated on-orbit, HJ-1 obtained a lot of research achievements in data evaluation and operational applications.

3 FUTURE SATELLITE SYSTEMS

3.1 FY-4 satellite



CGMS-40 is the second generation of geo-stationary meteorological satellite in China, which is planned to be launched in 2015. The detailed information can be found in documents provided by CMA .

3.2 CFOSAT satellite

CFOSAT is developing jointly by China and France for ocean dynamic environment monitoring. Satellite will be equipped with a directional wave spectrum form SWIM and a wind scatterometer SCAT. Currently, CFOSAT is developing in PHASE C and will be launched at the end of 2014.

3.3 CBERS03/04 Resources satellites

CBERS 03/04 is the next generation of CBERS 01/02. CBERS 03/04 is in the phase D. CBERS 03 will be launched at the end of 2012 and CBERS 04 will be launched in 2014. Both will be equipped with high resolution camera, IR camera, and wide-field camera, providing 5-meter panchromatic measurement, 10/20-meter multi-spectral measurement, 40/80-meter infrared measurement, and 73-meter multi-spectral measurement with wide-field swath.

3.4 HJ-1 C SATELLITES MISSION

HJ-1C is the S-band SAR small satellite, providing 20-meter resolution daily observing measurement. It can revisit prime areas every four days. The satellite will be launched this year.

4 CONCLUSIONS

China Earth observation satellite system is playing an important role in the national development, environmental protection, disaster detection etc., CNSA is devoted into the transformation from R&D satellite to operating satellite. Many R&D satellites will be experienced on-orbit test, and become gradually into the operation mode. Some related administrations are jointly organizing a new discussion about operational satellite system. Discussing and sharing experience with each CGMS members, we like making more contribution for the optimization of EOS.