

**Long-term satellite activities of JMA
to materialize a robust satellite observing system**

This paper reports on the long-term satellite activities of JMA to materialize a robust satellite observing system.

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1. Operational schedule of JMA's geostationary meteorological satellites

After the launch on 26 February 2005 and its in-orbit test thereafter, MTSAT-1R started its operation on 28 June 2005; it is planned to keep operational until 2010. MTSAT-2, the follow-on satellite to MTSAT-1R, is expected to be launched by the end of March 2006. After its in-orbit test, MTSAT-2's meteorological function will be on standby in orbit until it takes over the meteorological function of MTSAT-1R in 2010. MTSAT-2 will be operational from 2010 to 2015.

2. Long-term backup arrangement

From May 2003 through July 2005, NOAA's GOES-9 satellite had provided JMA with geostationary satellite coverage of the Western Pacific under an implementing arrangement signed by NOAA and JMA in 2002. GOES-9 had backed up JMA's Geostationary Meteorological Satellite-5 (GMS-5), since GMS-5 was experiencing imaging problems after being compelled to continue its operation on account of the launch failure of MTSAT(-1) in 1999. Avoidance of the crisis which could be caused by the interruption of satellite observations over the Asia-Pacific region should be totally credited to the bold decision and serious endeavor of NOAA/NESDIS and its staff members.

Considering the above cooperation between NOAA and JMA to successfully backup GMS-5 with GOES-9, and recognizing that space-based Earth remote sensing missions have inherent risk including launch failure and in-orbit spacecraft failure, NOAA and JMA signed a long-term implementing arrangement on 23 February 2005 to guarantee continuous geostationary satellite coverage of the East Asia and the Western Pacific, in case either agency experiences a spacecraft failure. Under this implementing arrangement, NOAA and JMA agree to provide geostationary backup coverage in an emergency, and monitor typhoons and other severe weather that threaten both nations. If either a NOAA or JMA geostationary spacecraft stops operating, and has no available back-up satellite of its own, then the partner agency would temporarily move one of its satellites, if available, toward the appropriate region and provide coverage for up to one year - at no cost, allowing the other agency time to recover from the failure and launch a replacement spacecraft. The long-term implementing arrangement will enter into force when JMA comes to have two operable geostationary meteorological satellites, one operational satellite positioned at 140° East, and one that is not required for any other mission, and therefore available for backup.

3. Concept studies on the follow-on satellite to MTSAT-2

JMA has started concept studies on the follow-on satellite to MTSAT-2, aiming at completing its fabrication and launching by 2015 or earlier, in order to materialize a robust

satellite observing system to cover the Western Pacific as early as possible, including the early entry into force of the long-term implementing arrangement. The concept studies include the preparatory activities to arrange for a tentative mission specification for the follow-on satellite this year. At the initial stage of the studies, JMA has been conducting internal interviews and surveys on tentative requirements to data and image of the satellite such as frequency bands, resolution and frequency of observations, for JMA's wide range of diverse services, including

- operational meteorological monitoring and forecast,
- numerical weather forecast,
- climate monitoring and forecast, and
- volcanological monitoring,

aiming at satisfying the foreseeable needs in operational usage of JMA itself in the period after around 2015.

JMA will conduct these studies taking into account of the increasing requirements from the field of numerical weather prediction to directly assimilate satellite data, including sounder data.