CGMS-XXVII JPN WP-02
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Agenda Item : B.2

STATUS OF THE GEOSTATIONARY METEOROLOGICAL SATELLITES

The purpose of this document is to present the status of the GMS-5, GMS-4 and MTSAT.

No action required

Status of the Geostationary Meteorological Satellites

1. GMS-5

GMS-5, launched on March 18, 1995, has been in operation at 140E. The GMS-5 operations are summarized in Attachment-1.

The most significant concern regarding the operation of GMS-5 is lubricant build-up in the mirror scanning mechanism. To roll down the build-up, JMA monitors the scanning torque and sometimes changes the combination of scanning range of the mirror.

As explained in the CGMS-XXVI meeting, GMS-5 has a trouble on the calibration shutter which sometimes becomes out of synchronization and may cast shadow on the earth images. JMA avoids the trouble by turning off/on the actuator of the shutter operationally.

GMS-5 provides 28 full-disk earth images per day, namely, 24 images for hourly observations and four images for wind observations. In addition, special wind observations are performed once a day when typhoons exist within a specific area.

Special 15 minute interval observations of the southern hemisphere for wind extraction were carried out on successive four days in April 1999 as part of a joint project of the Japan Meteorological Agency (JMA) and the Australian Bureau of Meteorology (BoM).

GMS-5 is to be moved and stationed at 120E as the back-up satellite after its missions are taken over by MTSAT.

The amount of remaining fuel is 12.5 kg as of June 21, 1999, which is enough to keep GMS-5 at a fixed longitude for a few tens of years if North-South maneuvers are not carried out.

2. GMS-4

GMS-4, launched on September 6, 1989, has been stationed at 120E since July 1995 as the backup to GMS-5. The GMS-4 operations are summarized in Attachment-2.

The solar cells were considerably damaged by solar particles ejected from solar flares in 1989, and have been weakening year by year. The cells do not have enough capacity to make observations in summer solstice seasons.

According to telemetry□data, the electric current of Space Environment Monitor (SEM) detector has been showing zero since October 1998, though the SEM data seems normal. The other functions of GMS-4 are normal. No observations are

presently carried out by GMS-4. GMS-4 is to be deorbitted after MTSAT functions are confirmed to be nominal.

3. MTSAT

MTSAT (Multi-functional Transport Satellite) is to be launched from Tanegashima Space Center in Japan.

The launch of the MTSAT was postponed no earlier than November 1999 because of launch vehicle problems.

After being launched, the MTSAT is to be stationed on temporary position at 135E, where the In-Orbit Test (IOT) will be carried out for six months.

The MTSAT is to take over the mission of GMS-5 at 140E soon after the IOT is normally completed.

Attachment-1

Summary of GMS-5 operations

1. Summary of observations (From February 1998 through June 1999)

	ROUTINE OBSERVATIONS	OMISSIONS	CANCELLATIONS	SPECIAL OBSERVATIONS
Feb.1998	774	10	0	0
Mar.	792	73	3	0
Apr.	812	28	0	0
May	868	0	0	0
Jun.	838	0	2	0
Jul.	866	2	0	2
Aug.	858	10	0	26
Sep.	766	74	0	36
Oct.	827	41	0	34
Nov.	840	0	0	6
Dec.	868	0	0	10
Jan.1999	852	16	0	0
Feb.	774	10	0	0
Mar.	795	73	0	0
Apr.	811	29	0	29
May	868	0	0	4
Jun.	836	4	0	5

ROUTINE OBSERVATIONS - Number of completed routine observations.

OMISSIONS - Number of canceled observations by eclipse, test, maneuver, or maintenance.

CANCELLATIONS - Number of canceled observations caused by interferes in the radio-communication circuits or troubles in ground systems.

SPECIAL OBSERVATIONS - Typhoon observations or observations for special purposes.

2. Summary of maneuvers

The maneuvers performed between June 1998 and June 1999 are as follows,

-East-West maneuvers : 24 June, 5 August, 5 October, 16 November,
21 December 1998,
2 February, 6 April, 20 April, 2 June 1999.

- North-South maneuvers : 14 July 1998, 18 January 1999.

- Spin rate maneuvers : 14 July, 16 November 1998, 18 January 1999.
- Attitude maneuvers : 17 June, 16 July 1998,
  11 January, 20 January, 21 June 1999.

The orbital inclination angle is 0.40 degrees as of 29 June 1999.

3. Eclipse operations

The eclipse operations performed between June 1998 and June 1999 are as follows,

- Earth eclipse : between 30 August 1998 and 16 October 1998,
  between 26 February 1999 and 13 April 1999.
- Lunar eclipse : 21 August 1998.

Attachment-2

Summary of GMS-4 Operations (From June 1998 through June 1999)

1. Monitoring the satellite

Telemetry data are monitored once a week for two hours and once a month for 24-hours. Also trilateration ranging was carried out once a month at the 24-hour monitoring.

2. Summary of Maneuvers

The maneuvers performed between June 1998 and June 1999 are as follows.

- East-West maneuvers : 8 June, 24 July, 4 September, 19 October, 7 December 1998.
  22 January, 12 March, 28 April, 7 June 1999.
- Attitude maneuvers : 29 June 1998, 13 May 1999.

The orbital inclination angle is 3.98 degrees and the amount of remaining fuel is 9.17 kg as of 29 June 1999.

3. Summary of Eclipse Operations

The eclipse operations performed between June 1998 and June 1999 are as follows.

- Earth eclipse : between 21 August 1998 and 8 October 1998.
  between 20 February 1999 and 4 April 1999.
- Lunar eclipse : 21 August , 22 August 1998.