

APT AND WEFAX CONVERSIONS

(Submitted by the WMO)

Summary and purpose of document

This document describes the status of activities related to the conversion of the APT/WEFAX services from analogue to digital scheduled to occur at the end of the decade.

ACTION PROPOSED

CGMS Members to update the Status for LRIT/LRPT conversion for satellites in polar and geostationary orbit as contained in Appendix A

- Appendices:**
- A. Status for LRIT/LRPT conversion for satellites in polar and geostationary orbit
 - B. Guidance on the Migration of Satellite Receiving Stations to the New Meteorological Satellite Digital Data Broadcast Services
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DISCUSSION

1. In anticipating the transition and its corresponding impact on its Members, WMO initiated an LRIT/LRPT project within the Secretariat that will address three specific aspects of the conversion. The first aspect to be covered will be the transition period, its duration and regional application. The second aspect will address the modification or replacement of the existing ground receiving stations. This aspect will be accomplished in concert with CGMS satellite operators and equipment manufacturers. Finally, improved capabilities through increased awareness of the potentialities for the new data will be presented to potential users in the form of a new WMO Satellite Activities Technical Document.
2. In February 1998, WMO the Secretary-General wrote to all WMO Members to inform them of the LRIT/LRPT activities to be undertaken by the WMO Secretariat to assist during and after the conversion period. The letter also noted that extensive use of the WMO Home Page (<http://www.wmo.ch> then select WMO Satellite Activities) would be used to facilitate further notifications. Appendix A shows the latest status for LRIT/LRPT conversion for satellites in polar and geostationary orbit. The tables were reviewed at the twenty-sixth session (July 1998) of CGMS where the satellite operators discussed the dates when the new digital services would commence for their satellite systems and the duration of a transition period when both analogue and digital services would be available. The tables are available on Internet through the WMO Satellite Activities home pages at http://www.wmo.ch/hinsman/APT_WEFAXstatus.html.
3. An analysis of the table for LRIT conversion indicates that in WMO Regions I (Africa) and VI (Europe), there will be a three-year overlap starting in December 2000. WMO Regions II (Asia) and V (Southwest Pacific) will have a three-year overlap starting in March 2000. WMO Regions III and IV (South, Central and North America including the Caribbean) have not yet identified a transition date. The Indian Ocean area (RA II) appears to have no overlap starting in 2002. An analysis of the table for LRPT conversion shows that the morning (AM) satellite will start LRPT in 2002 while the afternoon (PM) satellite will start LRPT in 2009. Since there will be no transition period for the AM orbit or PM orbit separately, but rather a seven-year period when both APT (PM) and LRPT (AM) will be available, it will be necessary to maintain a dual capability (APT and LRPT) during the period 2002-2009 if it is deemed necessary to have information from AM and PM satellites. It can also be seen that the inclusive transition period for all Regions will cover the period from 2000 until 2009 or more.
4. The OPAG IOS Expert Team Meeting on Satellite System Utilization and Products held in Locarno, Switzerland, 2-4 June 1999 discussed a new WMO Satellite Activities Technical Document that would provide guidance to WMO Members on how to exploit the new LRIT/LRPT services. The meeting noted that the new technical document should be available prior to the commencement of the new digital services.
5. The Expert Team meeting considered an appropriate arrangement for preparing the technical document, taking into consideration the phasing issue. It agreed that such a technical document should contain a brief description of radiative transfer fundamentals to enable a reader to understand better the new capabilities being offered from the digital services. It also noted that a comprehensive description on the use of satellite data for all applications was not possible. However, an overview providing a basic description of possible applications would be beneficial to WMO Members when deciding on the utility of the new services.
6. The meeting recommended the development of a technical document describing how to exploit the new digital services. It agreed upon the outline for such a technical document as contained in Appendix B.
7. The next meeting of the Expert Team will be 25-29 October 1999 in Melbourne, Australia

following CGMS XXVII. The approved agenda includes an item to discuss a draft technical document to be finalized before the end of 1999. The WMO Secretariat has initiated a contract with a consultant to prepare a draft technical document to be considered at the Melbourne meeting. On 5 August 1999, all CGMS Satellite Operators were informed by email of the WMO contract. In the email, there was a request for materials that could be included in the new technical document. It is planned that the draft technical document be reviewed in Melbourne, updated as required and be ready for publication before MTSAT-1 becomes operational in March 2000. The technical document will be distributed to all WMO Members in both hard copy as well as made available on the WMO Satellite Activities web pages.

STATUS FOR LRIT CONVERSION, SATELLITES IN GEOSTATIONARY ORBIT

Operator	Satellite	Launch (M/Y)	Service	Start	Stop
EUMETSAT	Meteosat 5	03/1991	WEFAX	03/91	
	Meteosat 6	11/1993	WEFAX	11/93	
	Meteosat 7	09/1997	WEFAX	07/97	12/2003
	MSG 1	10/2000	LRIT	12/00	2003
	MSG 2	2002	LRIT	2003	2008
	MSG 3	2007	LRIT	2008	2013
India	INSAT I-d	06/1990	None		
	INSAT II-a	07/1992	None		
	INSAT II-b	07/1993	None		
	INSAT II-e	---	None		
Japan	GMS-4	09/1989	WEFAX	12/89	06/1995
	GMS-5	03/1995	WEFAX	06/95	
	MTSAT-1	08/1999	WEFAX LRIT	03/00 03/00	03/2003
USA	GOES - 8	04/1994	WEFAX	11/94	
	GOES - 9	05/1995	WEFAX	01/96	
	GOES - K	04/1997	WEFAX	06/97	
	GOES - L	07/2002	WEFAX	09/02	
	GOES - M	08/2000	WEFAX	10/00	
	GOES - N	2002	WEFAX/LRIT		
	GOES - O	2005	WEFAX/LRIT		
Russian Federation	Elektro-1	11/94	WEFAX		
	Elektro-2	---	WEFAX		
	Elektro-3	2002	LRIT	2002	
China	FY-2	---	WEFAX		

STATUS FOR LRPT CONVERSION, SATELLITES IN POLAR ORBIT

Operator	Satellite	Launch (M/Y)	Service	Start	Stop
EUMETSAT	Metop-1	2002	LRPT	2002	
	Metop-2	2007	LRPT	2007	
	Metop-3	2012	LRPT	2012	
USA	NOAA-9	12/1984	APT	12/84	08/95
	NOAA-12	05/1991	APT	05/91	
	NOAA-14	12/1994	APT	12/94	
	NOAA-K	08/1997	APT	08/97	
	NOAA-L	12/1999	APT	12/99	
	NOAA-M	04/2001	APT	04/01	
	NOAA-N	12/2003	APT	12/03	
	NOAA-N'	07/2007	APT	07/07	
	NPOESS-1	07/2009	LRPT	07/09	
	NPOESS-2	10/2010	LRPT	10/10	
China	FY-1 C	---	None		
	FY-1 D	---	None		
Russian Federation	Meteor 2-21	08/1993	APT	08/93	
	Meteor 3-5	08/1991	APT	08/91	
	Resourse-01-N4	----	APT		
	Meteor 3M-1	----	APT		
	Meteor 3M-2	2002	LRPT	2002	

GUIDANCE ON THE MIGRATION OF SATELLITE RECEIVING STATIONS TO THE NEW METEOROLOGICAL SATELLITE DIGITAL DATA BROADCAST SERVICES

A DRAFT OUTLINE

Explanation of the components of the document

Purpose of the Document

- To provide up-to-date information on the migration for planning purposes;
- To provide references to detailed technical information for System Engineers wishing either to procure or develop user stations;
- To provide operational users with information about typical product applications, their potential benefits and possible deficiencies.

Information for Planning

- What type of data will disappear, and when;
- What types of data will become available, who will provide them, how and when;
- What are the potential benefits of using the new data;
- What has to be done to get the new data;
- What are the alternatives;
- References to assess cost impact.

Information for System Engineers

- References to information necessary to develop a new user system;
- References to information necessary to procure a system from a manufacturer;
- Information necessary to seek possible support from WMO or other Organizations.

Information for Operational Users

- Product lists, derivation processes and accuracies, with references;
- Product potential benefits and deficiencies;
- Typical applications, with references/examples.

Document Compilation Principles

- No need to emphasize well known information;
- Only make reference to information available from existing WMO satellite technical documents;
- Emphasize new features of data and products with high application potential.

Outline of the document

List of Contents

- Introduction (overview of new broadcast services: LRIT, HRIT, LRPT, HRPT, Internet. etc.)
- Implementation time table
- List of data and products which will no longer be distributed after migration
- Fundamentals of radiative transfer as it relates to the new digital data
- LRIT/HRIT
 - Description and references
 - Mission specific data (content, file format) provided by the meteorological satellite operators, FY2, MTSAT, MSG, GOES, GOMS
 - Data, products and typical applications (day 1 with periodic update)
- LRPT/HRPT
 - Description and references of Global specs.
 - Mission specific data (content, file format) provided by the meteorological satellite operators, FY1, Metop, NPOESS, Meteor 3M
 - Data, products and typical applications
- Other broadcast services
 - Internet services
 - GTS services

Annexes

- References to user station specifications
- Manufacturers lists of user stations
- etc.