

Resolution A22-1R1

**INTERSESSIONAL WORKING GROUP (IWG) ON TECHNICAL AND
OPERATIONAL APPROACHES TO IMPROVE THE SPECTRUM
UTILIZATION OF EARTH EXPLORATION SATELLITE SERVICES IN
THE 8025 – 8400 MHZ BAND (IWG [X-BAND EES])**

The SFCG,

CONSIDERING

- a) that the 8025 – 8400 MHz Earth Exploration Satellite (EES) band is becoming congested due to growth both in the number of missions and the increase in the bandwidth requirements of some future Earth science missions;
- b) that in addition to the missions by member agencies, missions by non-member entities operate in the 8025 – 8400 MHz Earth Exploration Satellite (EES) band;
- c) that future wideband missions may use the Ka-band (25.5 – 27.0 GHz) where feasible, taking into account the availability in several agencies of on-board equipment, and the status of ground infrastructure development, in this band;
- d) that there is a need to optimise the use of the band by existing and future missions;
- e) that maintenance of a comprehensive database of missions operating in the 8025-8400 MHz band is required;
- f) that there are multiple approaches that should be considered to enhance the spectrum utilization of the 8025-8400 MHz band
- g) that early coordination among users can reduce the possibility of interference;
- h) that an increasing number of EESS missions is likely to increase also the interference into the deep space band 8400 – 8450 MHz;

NOTING

that past workshops have been effective at involving non-member entities and progressing the work of the SFCG;

RESOLVES

1. that the IWG [X-Band EES] has the following terms of reference:

to formulate a more rigorous and early coordination process involving member agencies and non-member entities;

to consider the methods of maintenance, including access and updating, of

a comprehensive database (see Annex 2) of member and non-member missions operating in the 8025-8400 MHz band;

to formulate an X-band Workshop per the preliminary guidance given in Annex 1;

to review the adequacy of provisional SFCG Rec 14-3R5;

to provide the status and results of the above analyses to the SFCG-24;

2. that Thomas von Deak (NASA) is the chairman of the IWG [X-Band EES], and the members are:

ESA	-	E. Marelli
ESA	-	M. Otter
CNES	-	F. Cornet
NASA	-	B. Kaufman
NASA	-	R. Porter
NASA	-	J. Miller
ESA	-	J.-L. Gerner
JAXA	-	S. Fukuda
ESA	-	B. Rommen
RASA	-	M. Vasiliev
CSA	-	J. Chambers
ASI	-	L. Garramone
NASA	-	R. Taylor
NASA	-	T. Berman
ISRO	-	S. Sayeenathan
DLR	-	K. Ruf
NOAA	-	D. McGinnis
NASA	-	R. Cager
NASA	-	F. Manshadi
NASA	-	M. Sue

Preliminary Guidance to the SFCG IWG [X-BAND EES] regarding the formulation of an X-Band Workshop

X-Band Workshop formulation

1. Identify and involve key persons from the non-Government sector to participate with SFCG participants in the formation of the Workshop, including establishment of objectives and agenda.
2. Identify date, duration, and location of workshop (tentative date: Spring, 2005) *Decision by 31 January 2004*
3. Establish and distribute objectives and agenda of the workshop by 31 May 2004.
4. Establish a Steering Group comprised of SFCG members and non-SFCG entities by March 2004¹.

Tentative X-Band Workshop Objectives (SFCG perspective)

1. Identify and involve key persons from the non-Government sector to participate with SFCG participants in the formulation of an appropriate coordination function.
2. Provide briefing information on the roles of the ITU-R and SFCG.
3. Provide the latest database showing the usage of the band.
4. Provide the results of all analysis to date.
5. Identify methods for reducing costs associated with potential interference.
6. Identify methods for avoiding costs associated with real-time on-orbit coordination.
7. Formulation of a cost-effective coordination function that addresses the needs of both Governmental and non-Governmental users of the 8025-8400 MHz band.
8. Present appropriate maintenance and distribution mechanisms for the X-Band user/mission database.
9. Promotion of the development of EES systems that reflect spectrum conservation based on provisional SFCG Recommendation *Use of the 8025 - 8400 MHz Band by Earth Exploration Satellites*.
10. Identify the processes by which technical and/or operational recommendations can be approved to assure that all existing and future users are involved in their definition and equitably affected (ITU-R framework may be appropriate).
11. Review of current protection criteria in light of improved technologies.
12. Consider additional potential recommendations that would promote efficient usage by Earth Exploration-satellite service in the 8025-8400 MHz band.

¹ Tentatively an IWG meeting may be convened at the ITU in Geneva during the period March 15-17, 2004.

Annex 2 to Resolution [22-1R1]

Description of Information for Satellites using the band 8025-8400 MHz

1. Name of the mission*
2. Status (D= under development, C= under consideration, O**= in operation)*
3. Number of satellites*
4. Orbit type (LEO, LEO-sun synchronous, HEO, GSO)*
5. Required orbital parameters:
 - a) For all satellites:
 - Orbital altitude (apogee and perigee)
 - Inclination angle
 - b) In addition, for sun-synchronous orbits:
 - Mean local time (MLT) with indication of whether it applies to either the ascending or descending node;
 - The longitude on the surface of the Earth at the instant of time when the satellite crosses the equatorial plane in either the ascending or descending direction;
 - Repeat time, or number of orbits required to repeat the ground track;
 - c) In addition, for non-sun-synchronous orbits:
 - The right ascension of the ascending node (RAAN);
 - Epoch time of the ascending node and the corresponding mean anomaly of the satellite in the orbit.
6. Total bandwidth used / expected to be used per satellite*
7. Satellite EIRP* and gain pattern if available, frequency(s), modulation type and symbol rate, emission filtering if known and whether the system meets SFCG Recommendation 21-2
8. Requirement for broadcast mode and associated power, antenna gain, bandwidth, and frequency*
9. Required Eb/No at the input to the demodulator of the Earth station receiver
10. Number of ground stations and geographic coordinates (latitude, longitude)*
11. Antenna gains* and reference patterns of ground stations and receiving system noise temperature
12. Minimum Earth station antenna elevation required
13. Expected launch date and lifetime*

* For planned systems under consideration or development these items constitute the minimum information set. If information is not available, a best estimate should be provided and identified as such.

** For existing missions, reference to entries in SFCG Database will be considered sufficient.