

Agenda Item 10.2

GENERAL COMMENTS ON MEOSAR SYSTEM FROM INDIAN PERSPECTIVE

1. ACTION REQUIRED

The Joint Committee is invited to:

- a) note the following general comments with respect to the MEOSAR ground and space segments;
- b) consider these comments in regard to the evolution of the future MEOSAR ground system; and
- c) review and decide as appropriate the recommendations made in section 6.

2. BACKGROUND

With regard to evolution of MEOSAR system, this paper presents some observations/comments to note while developing ground system configuration, and Indian view points. India is aware that the provision of MEOLUTs will be an individual national responsibility as stated in section 2.3 of document C/S R.012, MEOSAR Implementation Plan.

3. COMMENTS

3.1 General

Compared to current LEOSAR and GEOSAR systems, the MEOSAR system is more complex in terms of hardware to implement and maintain in the future. Except for near instantaneous alerting with independent location system, no other major benefits are offered by the MEOSAR system. However, LEOSAR complemented by GEOSAR system with simple space and ground systems is doing the job meeting the SAR requirements and the Cospas-Sarsat mission statement. The current LEOSAR and GEOSAR systems also support near instantaneous alerting in the time frame given for the MEOSAR system to be fully operational, when most of the user community will have new generation GPS based beacons.

3.2 MEOSAR Ground Segment

The MEOSAR system having a substantial system configuration with a minimum of 4 large antennae and an associated processing system will require additional effort (man hours) for operations and maintenance, and as per our assessment it may cost at least 4 times the budget of current system for installation and maintenance. There will be a requirement of a large site without building obstruction to house 4 antennae, each of about 4.7m in size, and 4 independent RF receiving chains with associated antenna control units.

During the developmental phase of a minimum 2-3 years, a dedicated technical team will be required to realize the MEOLUT ground system for countries intend to develop and implement their own system.

Certainly MEOSAR has an edge over the existing system, but it is going to be quite a complex task for ground segment providers to establish and operate the system, and more to maintain it on long term basis (long term sustainability) particularly for the countries having no background in space operations. Even with a 3rd party operating and maintaining the system, it would be quite expensive, and complex to interface with other global ground systems requiring expertise to handle various issues (technical, operational and maintenance). If more ground systems (MEOLUTs) are allowed indiscriminately, practically it will be difficult to maintain operations and interfaces among various systems as per Cospas-Sarsat specifications.

3.3 MEOSAR Space Segment

It is equally challenging for space segment providers to provide and maintain SAR payload on each MEO satellite. The total constellation of satellites comprising of three independent systems (DASS, Glonass, Galileo) will have more than 70 satellites when fully operational, which is much larger and more complex than the current LEOSAR and GEOSAR space segments. Operationally, it will be difficult to maintain availability, outage and orbit vector dissemination/ reception/ validation/ updating of all MEO satellite status at each MEOLUT site. It will not be easy task for the Cospas-Sarsat Secretariat to maintain status of each satellite as well as coordinate various operations related matters with ground system providers. Probably, there would be requirement of additional manpower and funding for the Cospas-Sarsat Secretariat.

4. INDIAN PERSPECTIVE

At this stage it is too early to predict how the overall system is going to evolve and what policies Cospas-Sarsat member countries are going to adopt to support and realize the MEOSAR system.

From the projected MEOSAR schedule, it would be possible to have LEOSAR and GEOSAR services until 2015-16, which could be well supported by India with available ground and space resources.

Meanwhile, India will study development of in-house MEOSAR ground system, which is possible with the available resources, expertise and experience.

If there is global move towards developing an interconnected optimal MEOSAR ground system, India intends to participate and support the joint development by sharing technical expertise and providing required systems and resources.

Alternatively, India will continue to support the GEOSAR system by providing SAR payloads on INSAT series of satellites in parallel to MEOSAR system, which will meet national and regional requirements as far as Indian sub-continent is concerned. It will

maintain a state-of-the-art MCC meeting Cospas-Sarsat specifications, with the Indian GEOLUT in the loop and have connectivity with neighbouring MEOSAR system to receive and distribute the alert data in INMCC service area.

5. CONCLUSION

In view of the complex MEOSAR ground system configuration, it would be worth considering to have these systems developed, operated and maintained by participation of global space agencies [such as NOAA/NASA (USA), ESA (European), CNES (French), ISRO (Indian), CSA (Canada), Chinese Space Agency, JAXA (Japan), CONAE (Argentina), Brazilian Space Agency etc.] who know about space system operations, maintenance, problems and can provide reliable sustainable support on long term basis.

Cospas-Sarsat's move towards strategically locating a minimum number of **interconnected** MEOLUTs in various countries (considering redundancy also), possible to provide optimum global MEOSAR distress alerting services on long term basis. However, there may be certain policy issues to realize interconnected optimal MEOSAR ground system, which should be resolved by bilateral and multilateral interactions.

6. RECOMMENDATIONS

India recommends that the Joint Committee consider:

- a) development of a final MEOSAR ground system configuration and implementation plan for member countries to take appropriate decision at national level on type of participation (ground system provider or user state); and
- b) the optimum system configuration of interconnected MEOLUTs as per satellite footprints and regional coverage.