

SATELLITE SERVICES (INMARSAT AND COSPAS-SARSAT)

Analysis and assessment of the GMDSS performance of Inmarsat Ltd

Note by the International Mobile Satellite Organization (IMSO)

SUMMARY

<i>Executive Summary:</i>	This document provides analysis and assessment of the performance by Inmarsat Ltd of the company's obligations for the provision of maritime services within the GMDSS, as overseen by IMSO. The information covers the period from 1 January to 30 September 2004. It is assessed that, during this period, Inmarsat Ltd has continued to provide a sufficient quality of service to meet its obligations under the GMDSS.
<i>Action to be taken:</i>	Section 12.1
<i>Related documents:</i>	MSC 78/16/4, MSC 79/22/7, MSC 79/22/10, MSC 79/22/1, MSC 79/22/1/Add.1 and COMSAR 9/5/1.

1 INTRODUCTION

1.1 This document is the formal report to IMO by the International Mobile Satellite Organization (IMSO) on the performance by Inmarsat Ltd of that company's public service obligations in respect to the GMDSS, as established in Article 3(a) of the Convention on the International Mobile Satellite Organization, and Clause 2.1.2 of the Public Services Agreement (PSA). This report covers the period from 1 January 2004 to 30 September 2004. The previous report to IMO was made to the Seventy Eighth Session of the Maritime Safety Committee in MSC 78/16/4.

2 STATUS OF THE INMARSAT NETWORK

2.1 The operational status of key elements of the space and ground segments of the relevant Inmarsat systems is summarized in the following table:

		AOR-E	POR	IOR	AOR-W
OPERATIONAL SATELLITES		INMARSAT-3 F2 15.5°W	INMARSAT-3 F3 178°E	INMARSAT-3 F1 64°E	INMARSAT-3 F4 54°W
INMARSAT-A	NCS	GOONHILLY EIK	YAMAGUCHI SENTOSA	YAMAGUCHI SENTOSA	GOONHILLY EIK
INMARSAT-M/B	NCS	GOONHILLY EIK	YAMAGUCHI SENTOSA	YAMAGUCHI SENTOSA	GOONHILLY EIK
INMARSAT-C	NCS	GOONHILLY EIK	YAMAGUCHI SENTOSA	YAMAGUCHI SENTOSA	GOONHILLY EIK
INMARSAT-E	LES	AUSSAGUEL GOONHILLY	PERTH SANTA PAULA	PERTH AUSSAGUEL	SANTA PAULA GOONHILLY

2.2 The table shows four operational Inmarsat-3 satellites in the primary locations over four ocean regions. Inmarsat Ltd operates other satellites to provide non-GMDSS services and these satellites are configured to act as on-orbit spares for the rapid restoration of essential GMDSS services in the event of a prime satellite failure. Operational procedures are in place to ensure that full sparing capability is retained with this arrangement of the constellation and these procedures are exercised to prove their effectiveness (see section 5).

3 PERFORMANCE OF THE INMARSAT NETWORK

3.1 Availability figures for each service / ocean region

.1 The availability of all distress alerting and other GMDSS components within the Inmarsat system during the 12-month period from 01 October 2003 to 30 September 2004 is shown in the following table:

	AOR-E	IOR	POR	AOR-W
SPACE SEGMENT	99.9990%	99.9998%	100.0000%	100.0000%
INMARSAT-A	99.9992%	99.9964%	99.9990%	99.9973%
INMARSAT-B/F77	99.9990%	100.0000%	100.0000%	100.0000%
INMARSAT-C	100.0000%	100.0000%	100.0000%	100.0000%
INMARSAT-E	100.0000%	100.0000%	100.0000%	100.0000%

The definition of availability and methods of calculation are based on the approach adopted in section 3.5 of CCIR Report 918 (MOD F) "Availability of Communications Circuits in the Maritime Mobile Satellite Service", dated 15 December 1989.

.2 These figures relate to the availability of the network as a whole in each ocean region. Any periods of non-availability of individual Land Earth Stations (LESs) are not reflected in these figures. The figures represent a very high level of availability, with no loss of service on the POR and AOR-W satellites during the period. There has been a marginal improvement in availability of core GMDSS services such as Inmarsat C.

.3 The reduced availability figures for Inmarsat A services across the network are indicative of the age of the land earth station equipment providing those services. They include two outages of 14 and 16 minutes in the AOR-W and IOR respectively. Inmarsat C was fully available in all ocean regions throughout the period. There was one single outage of 5 minutes affecting the digital services Inmarsat B/Fleet 77 in the AOR-E during March 2004. Again, this resulted from land earth station equipment failure. None of these outages were judged significant for GMDSS operations.

.4 The universal figure of 100% availability for Inmarsat-E is a direct result of the way that system is engineered to provide complete duplication of every critical function.

.5 At the time of this report, all the operational spare satellites are fully operational and available to act as a contingency backup in the event of a prime satellite failure. At the end of October 2004 Inmarsat temporarily lost control of an Inmarsat 2 satellite located at 142 degrees West. This is one of the two satellites used as contingency spares for the POR, Control was re-established within a short time and the satellite returned to service. As a result of this event, IMSO has initiated a review of the contingency procedures to ensure that Inmarsat is able to maintain a viable contingency plan if such a failure should occur again.

3.2 **Number of Land Earth Stations providing GMDSS Services**

At present, 67 Inmarsat-A, 81 Inmarsat-B/M, 48 F77, 53 Inmarsat-C and 8 Inmarsat-E land earth stations (LEEs), located at various sites world-wide, provide the essential ground-based gateways for GMDSS related communications using basic telex, telephony and message transfer services. The figures include virtual as well as real LEEs and illustrate the total number of points of access to the network. There are enough LEEs in each system to ensure robust operation and provide alternatives in the event of local failure. These LEEs also operate the Inmarsat Ltd space and ground segments for distress alerting, follow-up communications and promulgation of Maritime Safety Information (MSI).

3.3 **Number of Ship Earth Stations and EPIRBs**

Inmarsat Ltd had over 100,000 registered GMDSS-capable mobile terminals at the end of October 2004, of which more than 69,000 are Inmarsat-C.

3.4 **Number of Distress Priority Calls / Alerts through the system**

.1 All distress alerts and calls through the Inmarsat system during the period were handled correctly and delivered promptly. Inmarsat Ltd uses the Distress Alert Quality Control System (DAQCS) to provide quantitative data on the number of distress priority calls, alerts and messages. The numbers of Inmarsat-C distress alerts received between 1 January and 30 September 2004 are as follows:

	AOR-E	AOR-W	IOR	POR	Total
Jan – Sept 04	338	175	235	435	1183

.2 The DAQCS continues to identify many of those ships which send false distress alerts. In February 2004 one ship sent 36 alerts, another 10 and three others 7 each. In April another ship sent 45 alerts and in May one ship originated 118 alerts. Each of these cases is followed up by correspondence in an attempt to identify the reason and discourage the vessel from repeating the error.

.3 There was a total of 1966 distress alerts handled via Inmarsat C in 2000, 2279 in 2001, 1891 in 2002 and 1919 in 2003. The trend for 2004 indicates a probable total of around 1450 for the year. This illustrates the reduction in the number of alerts achieved during 2004, believed to arise largely from Inmarsat's programme of contacting those vessels that send multiple distress alerts.

4 **CLOSURE OF THE INMARSAT E SYSTEM**

4.1 In September 2004 Inmarsat Ltd announced their intention to close the Inmarsat E system on 1 December 2006. Full details of the reasons for this decision are given in MSC 79/22/7 submitted by IMSO.

5 **OPERATIONAL SYSTEM TESTING**

5.1 The series of exercises to demonstrate the effectiveness of the GMDSS satellite service restoration procedures has been continued. Arrangements are now in hand to include participation by relevant Land Earth Station operators in future exercises.

6 OWNERSHIP OF INMARSAT LTD

6.1 Following the purchase of Inmarsat Ltd by Apax Partners and Permira in December 2003, IMSO has established a working relationship with the new management of the company. The Director is confident that this relationship will continue and contribute positively to the performance of the company's public service obligations under the terms of the Public Services Agreement (PSA).

7 LONG TERM PLAN

7.1 Information relating to the company's long term plan was given in the previous report. Since then, the launch schedule for the new Inmarsat 4 (I4) satellites has had to be modified. The first I4 launch is now expected during the first half of 2005, with the second I4 launch due in the 3rd quarter of that year.

8 INTERNATIONAL SEARCH AND RESCUE FUND

8.1 Following discussions with IMSO and IMO, Inmarsat Ltd has announced that it intends to donate a sum of 10,000 \$US to the International Search and Rescue Fund each year for the next five years. In addition, the company has coordinated the donation by the electronics manufacturers concerned of 6 Fleet 77 and 4 Inmarsat C satellite communication terminals for use in MRCCs in the East African region.

9 INTERNATIONAL SAFETYNET SERVICE

9.1 As part of its ongoing maintenance of facilities for the International SafetyNET Service, Inmarsat Ltd has upgraded the SafetyNET server hubs, which receive messages for broadcast from the information providers and re-directs them to alternative land earth stations for broadcast in the event of failure within the system. The new server hubs are currently undergoing final testing but are already fully operational.

10 IMSO ASSEMBLY

10.1 Amendments to the IMSO Convention

.1 The Seventeenth Session of the Assembly of the International Mobile Satellite Organization (IMSO) was held at Inmarsat Headquarters, London, from 18 to 22 October 2004. In response to the question asked by the Committee at its 77th session, the IMSO Assembly agreed by an overwhelming majority that IMSO is willing to carry out the oversight of future providers of mobile satellite communications services for the GMDSS.

.2 In addition, the Assembly developed amendments to the IMSO Convention that would enable IMSO to carry out the necessary oversight functions. The Assembly decided to approve, in principle, the amendments it had developed, with a view of adoption at a later stage without further substantive debate, unless this is required by the work necessary to be completed on other supportive instruments, such as the Reference Public Services Agreement.

10.2 Resolution A.888(21)

In considering the draft amendments to the IMSO Convention, the IMSO Assembly took the view that the text of IMO Assembly resolution A.888(21): Criteria For The Provision Of Mobile-Satellite Communication Systems In The Global Maritime Distress And Safety System (GMDSS) would need to be reviewed in parallel with the proposed amendments to the IMSO Convention and authorised the Director to submit a discussion paper to IMO. This paper has been circulated as COMSAR 9/5/1.

10.3 **Long Range Identification And Tracking Of Ships (LRIT)**

The IMSO Assembly noted that IMO is currently discussing the issue of Long Range Identification and Tracking of Ships (LRIT), and has charged the IMO Sub-Committee on Search and Rescue (COMSAR) with making recommendations. One possibility was that IMO will decide to ask IMSO whether it will be willing in future to carry out oversight and some other roles in relation to LRIT. The IMSO Assembly endorsed the Director's intention to keep in close touch with developments in this area and inform the Assembly accordingly.

10.4 The outcome of the IMSO Assembly was reported to the Maritime Safety Committee in MSC 79/22/1 and MSC 79/22/1/Add.1.

11 **CONCLUSIONS**

11.1 In view of the foregoing review of the status and performance of the relevant Inmarsat systems, it is IMSO's overall assessment that, during the period covered by this report, Inmarsat Ltd has continued to provide fully operational maritime mobile satellite distress and safety communication services for the GMDSS and fulfil the company's public service obligation as stated in paragraph 2.1.2 of the PSA.

12 **ACTIONS**

12.1 The Sub-Committee is invited to note:

- .1 the information provided on:
 - .1 the status and performance of the Inmarsat network (sections 2 and 3);
 - .2 the closure of the Inmarsat E EPIRB system (section 4);
 - .3 the planned launch of the new Inmarsat 4 satellites (section 7);
 - .4 support for the International Search and Rescue Fund by Inmarsat Ltd (section 8);
 - .5 ongoing maintenance of facilities for the International SafetyNET Service (section 9);
- .2 the continuation of the programme of operational exercises to demonstrate the continuing effectiveness of GMDSS service restoration procedures in all ocean regions (section 5);
- .3 the sale of Inmarsat Ventures Ltd., and the view of the Director of IMSO that a working relationship has been established with the new owners (section 6);
- .4 the outcome of the seventeenth session of the IMSO Assembly (section 10); and
- .5 the contents of this report in general, and in particular the conclusion that Inmarsat Ltd has continued to provide a sufficient quality of service to meet its obligations under the GMDSS during the period covered by the report (paragraph 11.1).

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