

Analysis and assessment of the GMDSS performance of Inmarsat Global Limited

Submitted by IHB

SUMMARY

Executive Summary: This document contains the annual report to IMO by IMSO on Inmarsat's obligations for the provision of maritime distress and safety services in the GMDSS, as overseen by IMSO.

Action to be taken: Paragraph 2.

Related documents: NCSR 3/19 dated 27 November 2015

1. See attached document.
2. The Sub-Committee is invited to note the information provided and take action as appropriate.

SUB-COMMITTEE ON NAVIGATION,
COMMUNICATIONS AND SEARCH AND
RESCUE
3rd session
Agenda item 19

NCSR 3/19
27 November 2015
Original: ENGLISH

**ANALYSIS OF INFORMATION ON DEVELOPMENTS IN
INMARSAT AND COSPAS-SARSAT**

Analysis and assessment of the GMDSS performance of Inmarsat Global Limited

Submitted by the International Mobile Satellite Organization (IMSO)

SUMMARY

Executive summary: This document contains the annual report to IMO by IMSO on Inmarsat's obligations for the provision of maritime distress and safety services in the GMDSS, as overseen by IMSO

Strategic direction: 5.2.

High-level action: 5.2.5

Planned output: 5.2.5.4

Action to be taken: Paragraph 50

Related documents: NCSR 1/18/1; NCSR 2/14/1; COMSAR 14/INF.6; MSC/Circ.1076; resolution A.1001(25); resolution A.707(17) and resolution A.801(19)

Introduction

1 This document is the annual report to IMO by the International Mobile Satellite Organization (IMSO) on the performance of Inmarsat Global Limited (Inmarsat) as the mobile-satellite communication system recognized to operate in the GMDSS. The report is prepared and submitted in accordance with the provision of section 2.5 of the annex to the IMO Assembly resolution 1001(25) on *Criteria for the provision of mobile satellite communication systems in the Global Maritime Distress and Safety System (GMDSS)*.

2 Inmarsat's public service obligations in respect to the GMDSS are established in articles 3(1) and 5 of the Convention on the International Mobile Satellite Organization and they are exercised through the Public Services Agreement (PSA) signed between IMSO and Inmarsat in 1999.

3 This report covers the period from 1 November 2014 to 31 October 2015. The previous report to IMO, covering the period 1 November 2013 to 31 October 2014, was made to the second session of the NCSR Sub-Committee in document NCSR 2/14/1.

Inmarsat communication systems for use in the GMDSS

4 Inmarsat offers a range of communication services to fulfil the functional requirements listed in resolution A.1001(25) in particular maritime distress, urgency, safety and routine communications, including broadcast of maritime safety information (MSI). The GMDSS compliant communication systems currently supported and provided by Inmarsat, are listed as follows:

- .1 **Inmarsat C** is the base satellite communications system primarily used for distress alerting and promulgation of MSI, including shore-to-ship distress relay messages. It is a two-way store and forward system that can handle data and messages up to 32kb. Inmarsat C is also utilized for other IMO systems such as Ship Security Alerting System (SSAS) and Long-Range Identification and Tracking of ships (LRIT);
- .2 **Inmarsat B** is a two-way direct-dial voice system used in the GMDSS for distress calling as well as general communications; and
- .3 **Inmarsat F/77** provides two-way distress voice communication service for the GMDSS. It also supports urgency and safety priority communications in ship-to-shore and shore-to-ship direction.

5 Inmarsat A system, which was the original analogue service introduced in 1982, had been withdrawn from service by Inmarsat on 31 December 2007 (MSC/Circ.1076).

6 Similarly, Inmarsat B system is now in the process of being phased out by Inmarsat. IMSO had communicated to the COMSAR Sub-Committee the company's intention to close the Inmarsat B system by 31 December 2014 (COMSAR 14/INF.6) but, at the first session of the NCSR Sub-Committee, this information was updated by IMSO with the news that the closure date for Inmarsat B has been postponed by two years to 31 December 2016 (NCSR 1/18/1) due to significant number of ships still utilizing the system.

7 The maritime community has been provided with ample time and options by Inmarsat so as to plan an orderly and cost-efficient migration to alternative communication systems. IMSO is working with Inmarsat to ensure that a sufficient programme of public information is going to be conducted in relation to the eventual closure of the Inmarsat B system. Inmarsat informed IMSO that the company will provide the maritime community with sufficient notice of the termination of any future system/service.

Inmarsat mobile-satellite communication system

8 Inmarsat mobile-satellite communication system is composed of a space segment to provide communication links with the earth; a ground segment to control and maintain the space segment and network; maritime mobile terminal to communicate with the users; and terrestrial networks to support connectivity with the land-based users.

Inmarsat space segment

9 Inmarsat GMDSS services are managed through four primary Inmarsat-3 (third generation, I-3) satellites over the four ocean regions named Indian Ocean region (IOR), Atlantic Ocean region East (AOR-E), Pacific Ocean region (POR) and Atlantic Ocean region West (AOR-W). One more third generation of satellite, I-3 F5, is used as a spare/lease satellite in case of contingency. Table 1 below shows the I-3 satellites in each ocean region with their orbital locations over the equator.

IOR	AOR-E	POR	AOR-W	Spare/Lease
Inmarsat-3 F1 64.5° E	Inmarsat-3 F2 15.5° W	Inmarsat-3 F3 178° E	Inmarsat-3 F4 54° W	Inmarsat-3 F5 25° E

Table 1: Inmarsat-3 satellites

10 In addition to the constellation of I-3 satellites, Inmarsat also operates four Inmarsat-4 (fourth generation, I-4) satellites to provide mainly non-GMDSS commercial services but also to ensure rapid restoration of essential GMDSS services in the unexpected event of a prime I-3 satellites failure. I-4 satellites operate over three ocean regions as tabulated in table 2 below. I-4 F2 satellite is in transit from 25°East to a new position at 64°East to form a fourth ocean region MEAS (Middle East and Asia) to improve coverage over the southern Indian ocean and over northern Russia.

APAC (Asian and Pacific)	EMEA (Europe, Middle East and Africa)	AMER (Americas)
Inmarsat-4 F1 143.5° E	Inmarsat-4 F2 & Inmarsat-4 F4A (Alphasat) 25° E	Inmarsat-4 F3 98° W

Table 2: Inmarsat-4 satellites

11 Inmarsat's current constellation of I-3 and I-4 satellites with their coverage maps are provided below in figure 1, and, continued on the next page, figures 2 and 3, respectively.

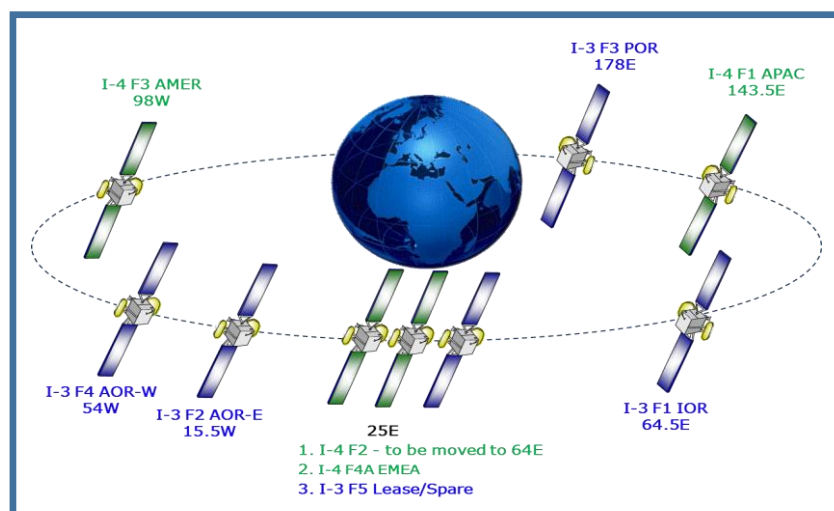


Figure 1: Inmarsat-3 and Inmarsat-4 satellite constellation – November 2015

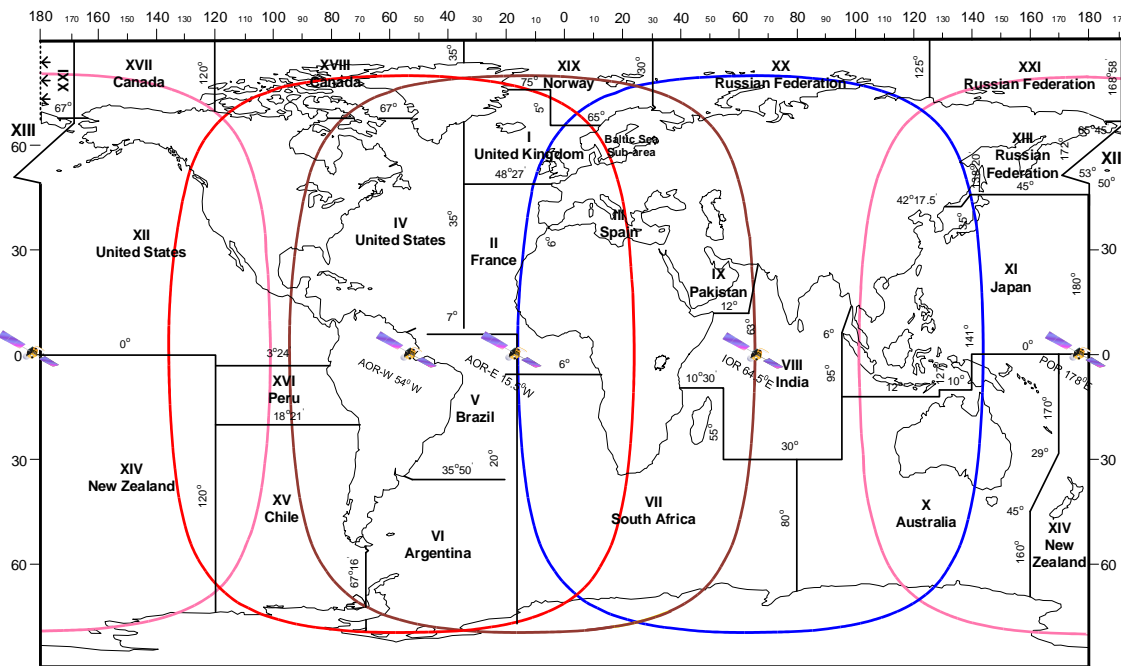


Figure 2: Inmarsat-3 coverage with NAVAREAs/METAREAs

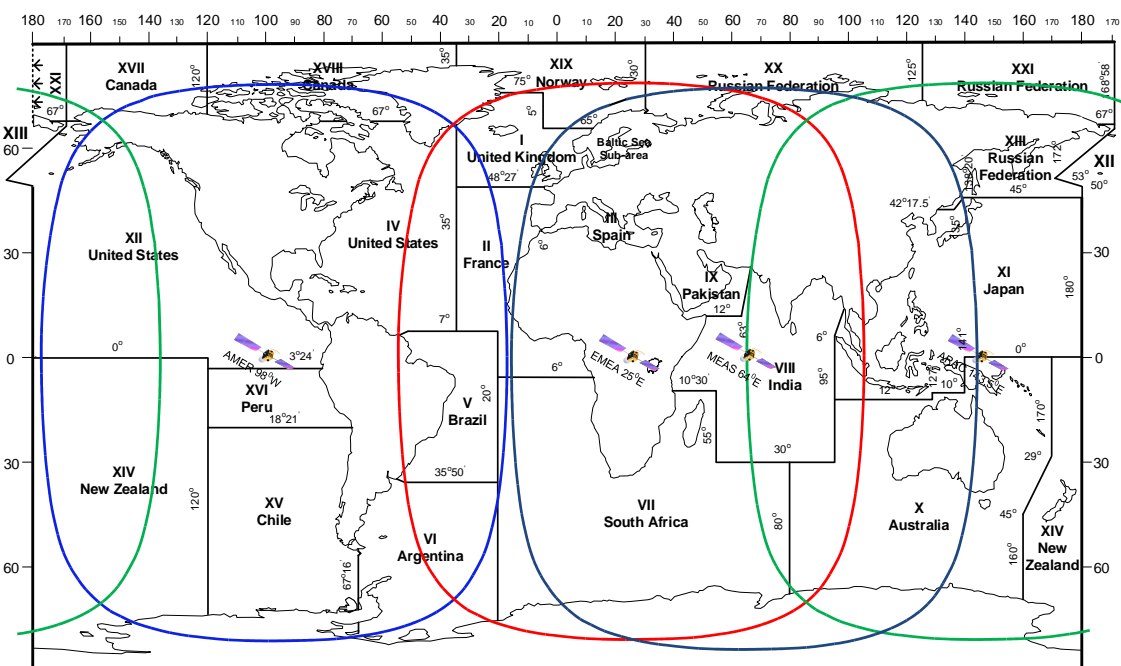


Figure 3: Inmarsat-4 coverage with NAVAREAs/METAREAs

Inmarsat Land Earth Stations (LES)

12 Inmarsat LESs provide the essential ground-based gateways for interconnection between the satellites and the terrestrial networks using data, messaging, voice and IP services so as to facilitate the GMDSS related communications including distress, urgency and safety traffic, promulgation of MSI and general communications. Some countries may still use telex connection though.

13 At present, there are 78 Inmarsat B/F77 and 34 Inmarsat C LESs located at various sites worldwide. These figures include also virtual LESs (hosted services) and illustrate the total number of points of access to the Inmarsat network. The number of LESs for each system is sufficient to ensure robust operation and provide redundancy in the event of local LES failures. These LESs support distress priority traffic, follow-up distress communications for Search and Rescue purposes and Inmarsat C LES are also used for promulgation of MSI using EGC SafetyNET services.

14 According to IMO requirements as stated in the Assembly resolution A.801(19), provision of radio services for the GMDSS, each LES supporting GMDSS services "should have a registered associated Rescue Coordination Centre (RCC) and have reliable communications by telephone, telex or other means". Table 3 below provides the list of Inmarsat C LESs as well as their operators, names, geographical locations and IDs together with names of the associated RCCs where ship-to-shore distress alerts and distress priority messages are automatically routed to.

LES Operator	LES Name*	Country**	AOR-E	AOR-W	IOR	POR	
KDDI	Yamaguchi	Japan			303 - Operations Centre, Tokyo	203 - Operations Centre, Tokyo	
	Yamaguchi at Aussaguel	France	103 - Operations Centre, Tokyo	003 - Operations Centre, Tokyo			
MCN	Beijing	China			311 - Beijing MRCC	211 - Beijing MRCC	
Morsviazspunik	Nudol	Russian Federation			317 - State MRCC, Moscow		
	Nakhodka					217 - Vladivostok MRCC	
Singapore Telecom	Sentosa	Singapore			328 - Port Operations Control Centre	210 - Port Operations Control Centre	
Stratos Global	Burum	Netherlands	102 - Falmouth MRCC	002 - Falmouth MRCC			
			112 - JRCC Den Helder	012 - JRCC Den Helder			
	Perth	Australia			302 - Falmouth MRCC	202 - Falmouth MRCC	
					312 - RCC Australia	212 - RCC Australia	
Telecom Italia	Fucino	Italy	105 - CG Rome		335 - CG Rome		
Airbus	Aussaguel	France	121 - CROSS Gris-Nez	021 - CROSS Gris-Nez	321 - CROSS Gris-Nez		
	Aussaguel at Yamaguchi	Japan				221 - CROSS Gris-Nez	
	Eik	Norway	104 - Stavanger JRCC				
			101 - USCG Norfolk				
	Eik at Santa Paula	USA					201 - USCG Alameda
							204 - Stavanger JRCC
Eik at Aussaguel	France		004 - Stavanger JRCC	304 - Stavanger JRCC			
			001 - USCG Norfolk	301 - Stavanger JRCC			
Vishipel	Hai Phong	Viet Nam			330 - Viet Nam MRCC		
TATA Comm	Pune	India			306 - MRCC Mumbai		

Table 3: Inmarsat C Land Earth Stations and associated MRCCs

Notes:

* Information on LES names is correct as at October 2015 based on the most up-to-date information available to Inmarsat.

** Country column shows location of Inmarsat C LES's antenna where initial ship-to-shore distress alerts are received.

Maritime mobile terminal

15 Inmarsat had more than 107,000 registered GMDSS-capable mobile terminals of different communication systems at the end of October 2015, of which more than 87,000 were Inmarsat C. In addition, more than 70,000 mini-C terminals, some of which are GMDSS compliant were registered in Inmarsat's database.

Connection with other networks

16 Inmarsat's network is connected to Rescue Coordination Centres, NAVAREA Coordinators and METAREA Issuing Services in order to facilitate distress priority traffic, follow-up distress communications and promulgation of MSI. The means of interconnection between Inmarsat network and RCCs or MSI providers varies from country to country and in some cases include the use of dedicated lines or public switched networks.

17 For instance, some LESs provide email, or internet (direct) drop access to the SafetyNET service that allows registered MSI providers to send EGC messages using email from any computer with access to the internet. Each user interface has its own access procedure and syntax command, which should be checked with the Inmarsat-C LES operator or service provider.

18 The availability and robustness of the communication links from any LES to the associated Maritime Rescue Coordination Centre (MRCC) or other shore-based national agencies, are entirely a national matter for the country concerned. In fact, at least two LESs are located in each ocean region under Inmarsat's coverage area and this arrangement is considered to be adequate to provide sufficient level of robustness.

Availability

19 In accordance with section 3.5.2 of resolution A.1001(25), IMSO monitors the availability of Inmarsat's space segment, provision of spare satellite capacity and network control function, and reports to IMO on an annual basis. The network availability of a recognized mobile satellite communication system is expected to achieve at least 99.9% in a given year. In this context, the network availability of the Inmarsat C and B/F77 systems during the 12-month period from 1 November 2014 to 31 October 2015 is shown below.

	IOR	POR	AOR-E	AOR-W
Space Segment (1-3 satellites)	100.00%	99.96%	100.00%	100.00%
Inmarsat B/F77	100.00%	99.95%	100.00%	100.00%
Inmarsat C	100.00%	99.97%	100.00%	100.00%

Table 4: Inmarsat B/F77/C availability figures

The definition of availability and methods of calculation in the Maritime Mobile Satellite Service are given in ITU Recommendation ITU-R M.828-2 (03/06), which superseded ITU-R M. 828-1 of 1992-1994.

20 These figures affirm that the core GMDSS systems provided by Inmarsat for distress alerting, Search and Rescue (SAR) coordination, promulgation of MSI and general communications have achieved an availability above 99.9% during the reporting period.

21 Availability in the POR was reduced because of two service outages experienced on I-3 F3 prime satellite. The first outage occurred on 3 November 2014 and lasted only 4 minutes during which the ship-to-shore Inmarsat C services were effected. Further information on the other outage happened in September 2015 is provided in paragraphs 32 to 36.

Restoration of service and spare satellites

22 Inmarsat has put in place means and arrangements for restoration of recognized maritime distress and safety communication services in the event of a partial or total satellite failure. These measures are regularly exercised and reviewed by Inmarsat, in consultation with IMSO, to review their efficiency and effectiveness.

23 According to Inmarsat's contingency arrangements, the four primary I-3 satellites used by Inmarsat for providing recognized GMDSS services are supported by one I-3 and two I-4 satellites to ensure full restoration of the services in case of a contingency. The other two I-4 satellites could also be used to provide GMDSS services, if needed, but their configuration may take longer as operational procedures would need to be created.

Contingency exercises

24 In accordance with section 3.6.2 of IMO Assembly resolution A.1001(25), IMSO and Inmarsat conduct contingency exercises to prove the efficiency and effectiveness of the arrangements in place in case of a prime satellite failure. These exercises are performed in every three or four months according to written procedures for each of the four prime satellites providing GMDSS services. During the exercises, Inmarsat aims to restore the recognized maritime distress and safety services within one hour after a confirmed prime satellite failure as required by IMO Assembly resolution A.1001(25).

25 Exercises are usually performed at Inmarsat Network Operational Centre (NOC) in London with the active participation of staff from the Inmarsat Satellite Control Centre (SCC), Network Operations Centre (NOC), company management as well as operators from the relevant Land Earth Stations. Some exercises are performed at Inmarsat's Operations Backup Centre (OBC), at Burum in the Netherlands, in order to exercise the staff, communications and decision making process at that facility. Inmarsat keeps operating procedures for the contingency exercises under review and updates them when necessary.

26 IMSO participates actively in the planning, execution and review of all satellite failure contingency exercises and works with Inmarsat to broaden the scope of these events. During this reporting period, two contingency exercises were successfully carried out and one could not be conducted due to overwhelming workload of the IMSO Directorate during and after the changeover of the post of the Director General in April 2015. Instead, a real contingency operation took place during the lunar eclipse event on 18 and 19 April 2015, which is explained further in paragraphs 29 to 31.

27 On 23 June 2015, a failure of the I-3 F3 satellite in POR was simulated at Inmarsat NOC in London. The exercise demonstrated the ability of Inmarsat to successfully transfer GMDSS services on the adjacent I-4 F1 (APAC) and I-4 F3 (AMER) satellites within one-hour time.

28 The second exercise was held at OBC at Burum in the Netherlands on 10 November 2015 for I-3 F4 satellite in AOR-W, which was successfully backed up by I-4 F3 (AMER) satellite.

"Lunar eclipse" contingency operations

29 I-3 F3 (POR) satellite had experienced a service outage due to the thermal effects resulting from an unusually long lunar eclipse (3 hours 26 minutes) preceded by a solar eclipse (1 hour 11 minutes) in September 2014. In order to maintain the recognized services, and as a precaution, Inmarsat transferred the services on I-3 F3 (POR) satellite to the contingency satellites I-4 F1 (APAC) and I-4 F3 (AMER) prior to a similar lunar eclipse event on 18 and 19 April 2015,

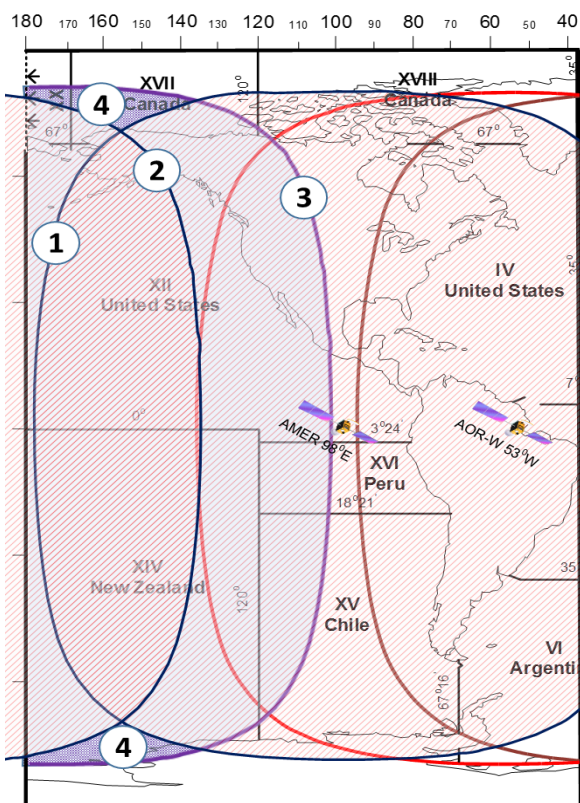


Figure 4: (1) I-4 F3 coverage (2) I-4 F1 coverage
(3) I-3 F3 coverage (4) Service gaps

30 Inmarsat first, conducted a contingency exercise on Tuesday 14 April with all the LESs affected in order to make sure the procedure goes smoothly on the 18 April. Inmarsat notified all affected LESs as well as IMSO and broadcasted an EGC message to all ships via Inmarsat C system explaining the situation and instructing ships which changes and additional set-up needed to be done on certain Inmarsat-C and mini-C models to comply with the new network configuration.

31 The procedure started on 18 April at 22:00 UTC and was completed successfully well within one-hour time as required by resolution A.1001(25). All services were restored on the primary POR I-3 F3 satellite after the eclipse had finished. Figure 4 illustrates the contingency arrangements during the eclipse in POR.

Satellite anomaly in POR on 20 September 2015

32 An anomaly with the frequency generation system of the I-3 F3 (POR prime satellite) payload occurred on 20 September 2015 at 12:37 UTC and affected all communication services including Inmarsat C maritime distress and safety services with the exception of the EGC SafetyNET message transmission with all priorities. The affected area under POR satellite coverage is shown in figure 5.

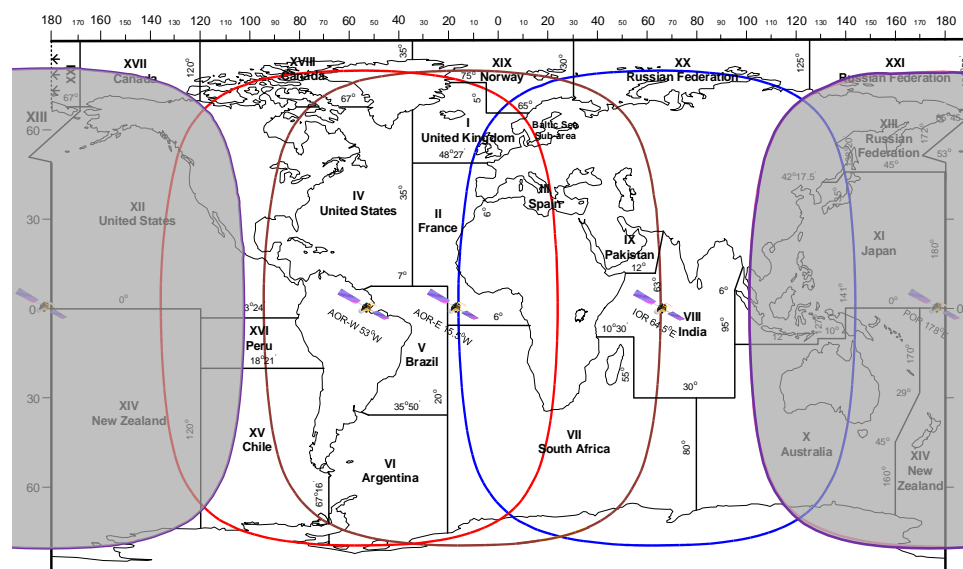


Figure 5: I-3 F3 coverage area affected during the anomaly shown as shaded

33 According to the contingency arrangements for I-3 F3 (POR) satellite, the transfer of the maritime distress and safety services to I-4 F1 (APAC) and I-4 F3 (AMER) satellites were initiated immediately by Inmarsat. The transfer to I-4 F1 (APAC) was completed at 14:31 UTC thus restoring the service in large parts of the prime satellite's coverage area. However, technical problems with the Eik LES hindered the transfer of safety services to I-4 F3 satellite. Payload functionality on the prime I-3 F3 satellite was recovered and all services over POR were restored to satisfaction at 17:03 UTC, 3 hours and 26 minutes after the start of the failure.

34 Inmarsat informed IMSO that the technical problems at Eik LES were discussed with the local team and new procedures were put in place after the incident. Inmarsat added that those problems were due to issues encountered with the required reconfiguration of the Inmarsat C equipment in order to operate over the contingency satellite.

35 In accordance with provision of section 3.5.3 of resolution A.1001(25), the IMSO Director General was informed, as soon as practicably possible after the failure had been confirmed, by Inmarsat and was later contacted again after the recognized services had been restored.

36 The resulting impact of this incident on the distress and safety services provided over the POR is illustrated in figure 6 below.

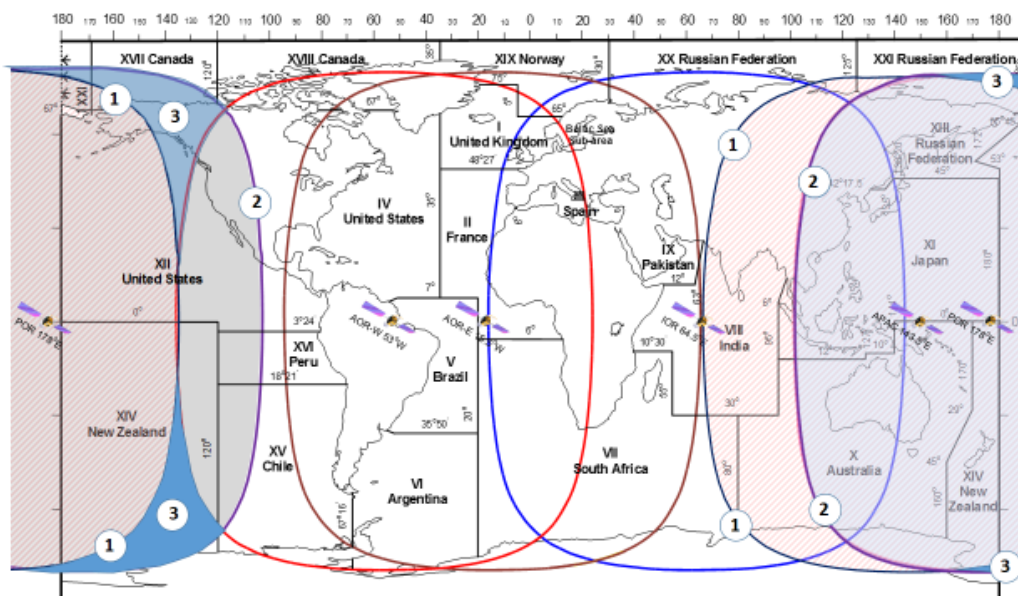


Figure 6: (1) I-4 F1 coverage (2) I-3 F3 coverage (3) Service gaps

Number of Distress Priority Calls/Alerts through the Inmarsat systems

37 Inmarsat uses the Distress Alert Quality Control System (DAQCS) to provide quantitative data on the number of Inmarsat C distress alerts and Inmarsat F77 priority calls processed. According to this, all distress alerts and calls through the Inmarsat C/B/F77 systems during the period between 1 November 2014 and 31 October 2015 were handled correctly and delivered promptly to the associated MRCCs. There was no ship-to-shore Inmarsat B distress alert/call in this period and it reflects the diminishing use of this legacy system, which is due for closure in December 2016.

38 An Inmarsat C distress alert is a pre-formatted data packet transmitted from the shipborne terminal and it contains information about date and time of distress alert, ID of the addressed LES, ship's identity (9-digit Inmarsat C mobile number), ship's position (latitude and longitude), time of last position update, ship's course and speed, nature of alert and indication that course and speed were updated. A distress alert is activated by pressing and holding a dedicated distress (SOS) button on the shipborne terminal. Number of ship-to-shore Inmarsat C distress alerts received during the aforementioned period is tabulated below.

	AOR-E	AOR-W	IOR	POR	Total (previous year)
Nov 14 - Oct 15	144	125	213	119	601 (777)

Table 5: Number of Inmarsat C distress alerts per ocean region

39 The numbers of ship-to-shore Inmarsat Fleet F77 priority voice calls in the same period was as follows:

	Priority	AOR-E	AOR-W	IOR	POR	Total (previous year)
Nov 14- Oct 15	Safety	9	7	24	26	66 (81)
	Urgency	35	14	39	22	110 (194)
	Distress	20	8	42	101	171 (93)

Table 6: Number of Inmarsat F77 voice priority calls per ocean region

40 In general, the use of Inmarsat C and F77 systems for ship-to-shore distress alerting and priority calling in all ocean regions was not significantly different from that of the previous years with the exception of distress priority calling on Inmarsat F77 particularly in IOR and POR. Inmarsat provides maritime distress and safety services, including distress alert/calls at no cost to the ships at sea in accordance with the provisions of resolution A.707(17) on *Charges for distress, urgency and safety messages through the Inmarsat system*.

False alerts

41 Each Inmarsat C distress alert is considered as a real situation by Inmarsat unless it is proven otherwise by the MRCC that receives it. When notified by an MRCC of a ship transmitting multiple false distress alerts, Inmarsat tries to contact the ship concerned to find the reasons behind the multiple alerts and offers assistance if required. Unfortunately, not all the ships respond to these contacts and cooperate with Inmarsat at the expected level. Where ships respond to such contacts, the reasons given for initiating false distress alerts invariably are attributed to human error, equipment test (use a real distress alerting service to test the terminal instead of built-in testing function) or equipment fault.

42 IMSO works very closely with Inmarsat on this matter and the Director General has agreed, at the request of Inmarsat, to contact the flag State of any vessel that does not respond to the approach by Inmarsat after they have initiated apparent multiple false distress alerts. There have been no such cases during the reporting period.

EGC SafetyNET Service

43 SafetyNET is an international service for the broadcasting and automatic reception of MSI and search and rescue related messages via Inmarsat C Enhanced Group Call (EGC) system. SafetyNET receiving capability is part of the shipborne equipment which is required to be carried by certain ships in accordance with the provisions of chapter IV of SOLAS Convention 1974, as amended.

44 SafetyNET messages are originated by authorized information providers, which include, but are not limited to NAVAREA Coordinators, METAREA Issuing Services and Rescue Coordination Centres. Information providers are charged with a special reduced rate for promulgation of MSI messages. The standards against which most of these broadcasts are issued and coordinated have been established by the International Hydrographic Organization (IHO) and the World Meteorological Organization (WMO).

45 SafetyNET messages include navigational and meteorological warnings, meteorological forecasts, shore-to-ship distress alerts, SAR information and other urgent information in accordance with the requirements of SOLAS Convention 1974, as amended. SafetyNET messages can be broadcast to a fixed area, such as in the case of a NAVAREA/METAREA, or to a user defined circular or rectangular area.

46 The number of SafetyNET messages worldwide fluctuates according to the season and is also driven by different events but was generally stable in this period compared to the previous reporting period. On average there were about 30,000 EGC messages per month including repeated messages, or about 1,000 messages per day. Table 7 below provides more details on the number of SafetyNET messages in this reporting period.

	AOR-E	AOR-W	IOR	POR	Total
Nov'14	7,589	6,658	6,280	9,115	29,642
Dec'14	6,629	5,204	5,751	7,577	25,161
Jan'15	6,646	5,082	7,192	8,721	27,641
Feb'15	7,453	5,742	7,008	8,553	28,756
Mar'15	8,689	5,491	8,357	9,351	31,888
Apr'15	9,965	5,113	8,393	9,052	32,523
May'15	8,811	4,627	7,281	8,509	29,228
Jun'15	7,965	5,145	7,634	8,721	29,465
Jul'15	7,581	5,800	8,257	8,976	30,614
Aug'15	7,030	6,641	7,697	10,081	31,449
Sep'15	7,906	7,239	7,762	9,301	32,208
Oct'15	6,511	7,131	7,485	8,422	29,549

Table 7: Number of EGC SafetyNET messages per month in all ocean areas

Evolution of the Inmarsat maritime mobile satellite services

47 IMSO had provided information to IMO relating to the intention by Inmarsat Global Ltd to seek future recognition and approval for Inmarsat FleetBroadband FB500 terminal to be used in GMDSS ship installations (MSC 88/8/3). FleetBroadband FB500 terminal operates on the I-4 satellite constellation and can be used to initiate non-GMDSS free-of-charge distress voice calls. When activated with the press of a "red button", the service sets up a priority call to the associated MRCC and at the same time, sends an email to the MRCC and network controllers to alert them and to provide them with additional data such as ship's name, identification, position and other relevant information. The FB500 terminal and the service is able to meet the requirements set out in resolution A.1001(25) apart from section 3.6.1 regarding a timing issue on restoration and spare satellites. Inmarsat reiterated to IMSO of its intention to seek approval for Inmarsat FleetBroadband FB500 terminal to be used in the GMDSS.

48 Inmarsat is also working on development and implementation of a new generation of safety data service using a broadband platform similar to Inmarsat C EGC SafetyNET services but improved and enhanced. The new services will use the I-4 satellite constellation and will include promulgation of MSI and SAR-related information with unique service code for each type of MSI, additional addressing, message repetition and cancellation facility, distress chat originated by RCCs for SAR purposes, optional acknowledgement mechanism for RCCs, "pull" of MSI from ships, etc.

Conclusions

49 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 Global 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 the PSA.

Action requested of the Sub-Committee

50 The Sub-Committee is invited to note the information provided in this document and in particular:

- .1 the closure of Inmarsat-B services by 30 December 2016 (paragraphs 6 and 7);
 - .2 status of Inmarsat's space segment, ground segment, maritime mobile terminals and network (paragraphs 8 to 18);
 - .3 availability of the GMDSS systems provided by Inmarsat between 1 November 2014 and 31 October 2015 (paragraphs 19 to 21);
 - .4 arrangements by Inmarsat for restoration of service and spare satellites (paragraph 23);
 - .5 ongoing programme of satellite contingency exercises, including the lunar eclipse contingency operations (paragraphs 24 to 31);
 - .6 the satellite anomaly occurred in POR on 20 September 2015 (paragraphs 32 to 36);
 - .7 number of distress priority alerts/calls made through the Inmarsat systems (paragraphs 37 to 40);
 - .8 ongoing efforts to reduce false alerts (paragraphs 41 and 42);
 - .9 use of EGC SafetyNET service (paragraphs 43 to 46); and
 - .10 the IMSO's overall assessment that Inmarsat Global Ltd continued to provide a sufficient quality of service during the period from 1 November 2014 and 31 October 2015 to meet its obligations under the GMDSS, the current Public Services Agreement between Inmarsat and IMSO (paragraph 49).
-