

12 – 15 September 2006, Buenos Aires,
Argentina

Origin: Inmarsat

Agenda item: 3.4.1.3

Inmarsat C EGC SafetyNET Status Report

This paper is to give an overall view of the Inmarsat C system, Inmarsat C and mini-C mobile terminals and some statistical information on the number and size of EGC SafetyNET messages broadcast through the system.

1. Inmarsat C system and services

Inmarsat C is a Store and Forward communication system with global coverage between 76° North and 76° South that was launched in 1991 and provides services via mobile earth stations (MESs) with an omnidirectional antenna. Maritime MESs are of small size and weight, as shown on figure 1, and can be easily installed on any type of vessel. Inmarsat C is the main part of the GMDSS equipment and performs 6 (out of 9) communications functions required by SOLAS Convention. There are more than 74,000 Inmarsat C MESs fitted on vessels.

Inmarsat mini-C is a family of new compact models with lower transmit power and power consumption as shown on figure 2. Mini-C MESs from various manufacturers support all Inmarsat C communication functions and some models are GMDSS compliant with Distress Alerting and EGC SafetyNET functions. There are more than 21,000 Inmarsat mini-C MESs fitted on vessels.

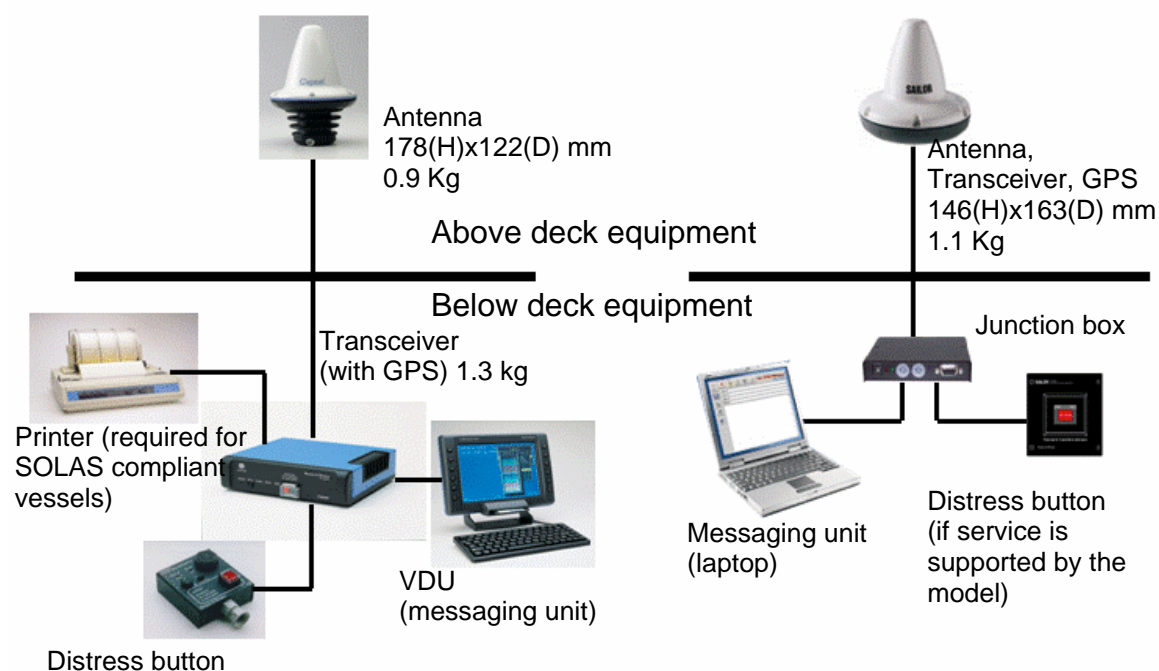


Figure 1- Inmarsat C mobile terminal
(with distress capability)

Figure 2 – Inmarsat mini-C terminal
(with distress capability)

Inmarsat C and mini-C maritime mobile terminals support the following communication functions:

- Store and Forward data and messaging to telex, fax (text, ship-to-shore direction only), e-mail, data network (PSDN), another mobile and short (or special) access code (SAC) for addressing ship-to-shore maritime safety information to shore-based authorities, e.g. request for medical advice, sending meteorological report to Met centres, navigational hazards and warnings, etc.
- Distress Calling (automatic routing to an associated Maritime Rescue Coordination Centre (MRCC):
 - distress alerting (single data packet that contains information on ship's identity (Inmarsat mobile number), position (lat/long from integrated GPS receiver), course, speed, nature of distress, time of last position update and date/time of the alert). The distress alert is transmitted by using the dedicated distress button and requires two independent actions. An average time between sending a distress alert and its delivery to the associated MRCC is within one minute;
 - distress priority messaging (detailed message with more information on the distress event) that is automatically routed to the associated MRCC.
- Enhanced Group Calling (EGC):
 - EGC SafetyNET (promulgation of Maritime Safety Information as required by SOLAS Convention);
 - EGC FleetNET (broadcast of commercial information, e.g. news, market situation to the predetermined group of vessels of the same flag, same shipowner, etc.
- Data reporting and polling (position reporting, monitoring, supervisory control, ship security alerting service (SSAS), long range identification and tracking (LRIT)).
- Supports 6 out of 9 GMDSS communication functions as required by SOLAS Convention, Regulation 4:
 - transmitting ship-to-shore distress alerting;
 - receiving shore-to-ship distress alerting;
 - transmitting and receiving search and rescue co-ordinating communications;
 - transmitting and receiving on-scene communications;
 - transmitting and receiving maritime safety information (*via the EGC SafetyNET system*); and
 - transmitting and receiving general communications

Note: some Inmarsat mini-C models are not designed to support distress calling and/or EGC functions.

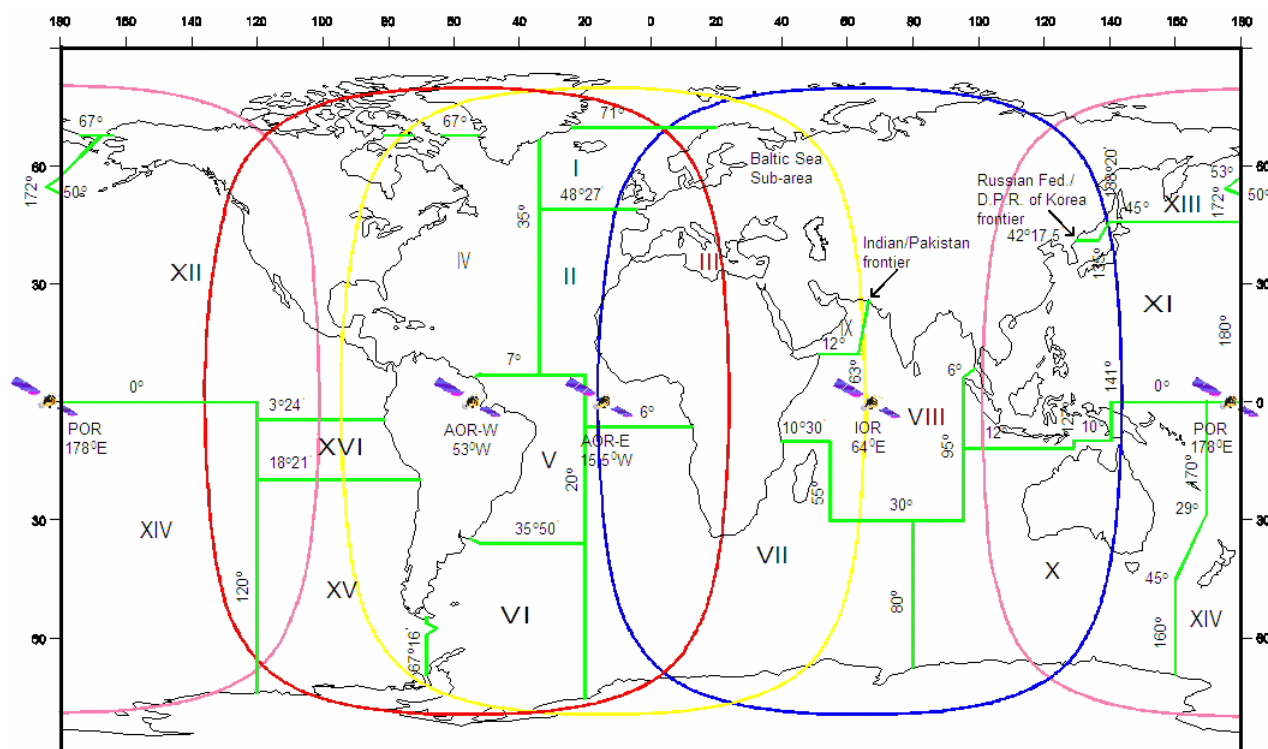


Figure 3 - Geographical areas for co-ordinating and promulgating radio-navigational warnings

2. EGC SafetyNET statistics

The table below shows the total number of EGC SafetyNET messages and size per ocean region in all ocean regions per month in the last 12 months (size of messages is shown in number of units of 32 bytes/characters):

Month	AOR-E		AOR-W		IOR		POR		Total SafetyNET	
	Number	Size	Number	Size	Number	Size	Number	Size	Number	Size
Jul'05	3644	136460	2466	149068	8256	120254	6715	194536	21081	600318
Aug'05	4244	161096	2846	174346	8353	121506	6850	210978	22293	667926
Sep'05	4068	206452	3094	184948	9225	134673	6032	211234	22419	737307
Oct'05	4350	155906	2735	176725	9248	138044	6070	201229	22403	671904
Nov'05	4484	127993	2027	141988	9125	142087	5403	179212	21039	591280
Dec'05	4586	159862	2331	162533	10422	164637	5425	187965	22764	674997
Jan'06	4118	114913	1975	153884	11106	161288	4960	191467	22159	621552
Feb'06	4463	133069	1778	131345	8263	120390	4036	150941	18540	535745
Mar'06	3922	111412	2129	158109	11636	162687	4942	176727	22629	608935
Apr'06	3637	106338	2242	145060	8795	130211	5337	181427	20011	563036
May'06	3978	114430	2437	161581	8076	116098	5901	179407	20392	571516
Jun'06	3914	103142	2795	140390	7846	117591	6785	184888	21340	546011
Jul'06										

On average 600-730 EGC SafetyNET messages of all service types are broadcast in all ocean regions per day, including repeated messages, of which:

- AOR-E 120 – 170 messages per day;
- AOR-W 60 – 95 messages per day;
- IOR 250 – 370 messages per day; and
- POR 130 – 220 messages per day.

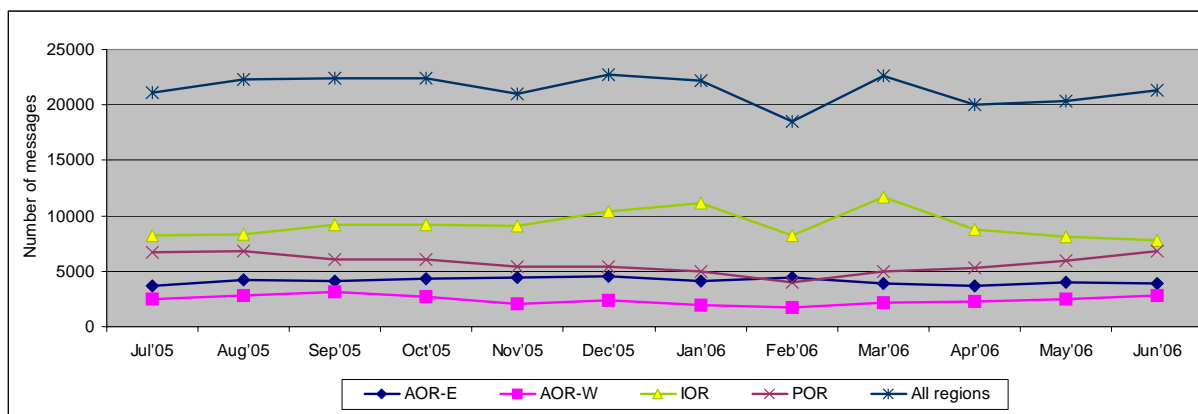


Figure 4 – Number of EGC SafetyNET messages of all service types per month

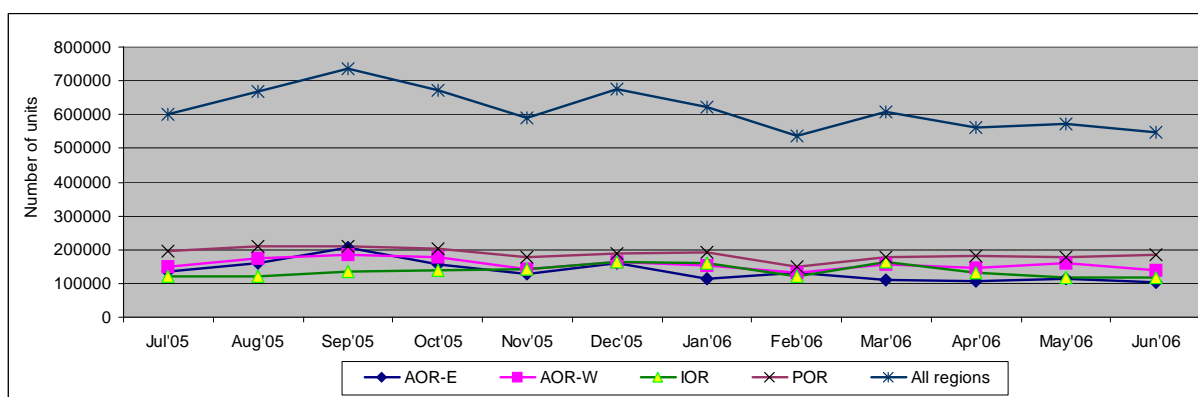


Figure 5 – Size of EGC SafetyNET messages (in number of units of 32 bytes/characters) of all service types per month

IMO SafetyNET Manual, Annex 4, defines the following services and service types (C2 code) of maritime safety information:

1. Navigational warning services:
 - a. C2 = 13 - Coastal warnings;
 - b. C2 = 31 - NAVAREA warnings.
1. Meteorological services:
 - a. C2 = 13 - Met warnings or forecasts to coastal area;
 - b. C2 = 24 - Met warnings to circular area;
 - c. C2 = 31 - Met warnings or forecasts to METAREA.
1. SAR services:
 - a. C2 = 00 – General (all ships) call;
 - b. C2 = 14 – Shore-to-ship distress alerts to circular area;
 - c. C2 = 31 - Urgency and Safety traffic;
 - d. C2 = 34 – SAR coordination to rectangular area;
 - e. C2 = 44 – SAR coordination to circular area.
1. Piracy countermeasures broadcast messages:

a. C2 = 04 – Nav warnings to rectangular area

Note 1: Service code C2 = 24 is defined in the SafetyNET Manual for Meteorological service only as Met warnings to circular area.

Note 2: Since some service codes are defined and used for both navigational and meteorological information, it is not possible for Inmarsat to provide accurate information on separate numbers and sizes of navigational and meteorological messages. This needs to be done by individuals MSI providers.

The tables below show the number of SafetyNET messages of each service type per month and per ocean region for the last 12 months:

2.1 Atlantic Ocean Region East

Service type	Coastal wng	Shore-to-Ship DA	NAVAREA METAREA	SAR to Circ	SAR to Rect	Met wng to Circ	Nav wng to Rect	Total ALL
C2 code	C2=13	C2=14	C2=31	C2=44	C2=34	C2=24	C2=04	
Jul'05	0	276	3245	112	2	9	0	3644
Aug'05	0	185	3908	135	5	11	0	4244
Sep'05	0	223	3753	64	0	28	0	4068
Oct'05	0	290	3953	99	0	8	0	4350
Nov'05	0	240	4056	178	5	5	0	4484
Dec'05	0	386	4073	99	10	18	0	4586
Jan'06	0	169	3843	59	36	11	0	4118
Feb'06	0	228	4023	166	33	13	0	4463
Mar'06	0	183	3633	65	30	11	0	3922
Apr'06	0	191	3281	97	61	7	0	3637
May'06	0	163	3717	67	23	6	2	3978
Jun'06	4	217	3624	40	22	7	0	3914
Jul'06								
Aver. %	0	5.6%	91.3%	2.4%	0.5	0.3	0	100.0%

The table shows that number of C2 =13 Coastal warning messages in the AOR-E is zero and 4 messages in June are Inmarsat test messages to check how the system handles the service. Test messages were sent and received successfully.

The majority messages are transmitted as NAVAREA/METAREA warnings and forecasts and the percentage is 87-96% out of the total number of messages.

2.2 Atlantic Ocean Region West

Service type	Coastal wng	Shore-to-Ship DA	NAVAREA METAREA	SAR to Circ	SAR to Rect	Met wng to Circ	Nav wng to Rect	Total ALL
C2 code	C2=13	C2=14	C2=31	C2=44	C2=34	C2=24	C2=04	
Jul'05	17	476	1874	67	7	9	16	2466
Aug'05	40	438	2257	71	10	9	21	2846
Sep'05	64	196	2557	66	5	191	15	3094
Oct'05	47	379	2153	130	4	6	16	2735
Nov'05	19	247	1555	181	1	9	15	2027
Dec'05	3	499	1524	277	8	7	13	2331
Jan'06	0	279	1544	113	2	22	15	1975
Feb'06	2	280	1317	93	38	31	17	1778
Mar'06	1	541	1376	74	93	29	15	2129
Apr'06	0	338	1696	82	35	24	67	2242

May'06	7	232	1916	131	6	26	119	2437
Jun'06	7	325	2180	84	4	21	174	2795
Jul'06								
Aver. %	0.7%	14.7%	76.1%	4.7%	0.7%	1.3%	1.7%	100%

The situation in the AOR-W is similar to the AOR-E but with some Coastal warnings, more shore-to-ship distress alerts and navigational warnings to rectangular areas.

2.3 Indian Ocean Region

Service type	Coastal wng	Shore-to-Ship DA	NAVAREA METAREA	SAR to Circ	SAR to Rect	Met wng to Circ	Nav wng to Rect	Total ALL
C2 code	C2=13	C2=14	C2=31	C2=44	C2=34	C2=24	C2=04	
Jul'05	4004	22	1928	1293	3	965	41	8256
Aug'05	4085	105	1986	1325	8	787	57	8353
Sep'05	4696	40	2190	1286	9	886	118	9225
Oct'05	5012	60	1785	1231	10	1042	108	9248
Nov'05	5081	74	2068	1087	3	722	90	9125
Dec'05	5730	25	2351	1404	0	812	100	10422
Jan'06	6777	27	2087	1345	0	768	102	11106
Feb'06	4671	18	1960	1107	0	417	90	8263
Mar'06	7206	16	2395	1177	0	739	103	11636
Apr'06	4783	33	2127	1210	0	556	86	8795
May'06	4340	14	1920	1261	2	437	102	8076
Jun'06	4055	27	1759	1309	0	599	97	7846
Jul'06								
Aver. %	54.8%	0.4%	22.3%	13.6%	0	7.9%	1.0%	100%

The table shows that the majority of SafetyNET messages in the IOR are transmitted as C2 = 13 Coastal warnings, both navigational and meteorological. The percentage of coastal warnings is 50-60% out of the total number of messages.

2.4 Pacific Ocean Region

Service type	Coastal wng	Shore-to-Ship DA	NAVAREA METAREA	SAR to Circ	SAR to Rect	Met wng to Circ	Nav wng to Rect	Total ALL
C2 code	C2=13	C2=14	C2=31	C2=44	C2=34	C2=24	C2=04	
Jul'05	1553	244	2337	78	4	2131	368	6715
Aug'05	1055	364	2575	74	17	2217	548	6850
Sep'05	867	195	2479	112	0	1927	452	6032
Oct'05	1281	194	2105	125	0	1887	478	6070
Nov'05	1518	285	1890	71	4	1437	198	5403
Dec'05	1327	314	1712	154	8	1739	171	5425
Jan'06	1329	375	1758	69	3	1238	188	4960
Feb'06	966	141	1772	83	5	916	153	4036
Mar'06	1212	349	1886	77	0	1290	128	4942
Apr'06	1214	392	2018	89	4	1509	111	5337
May'06	1637	286	2270	94	6	1475	133	5901
Jun'06	1680	633	2679	104	4	1485	200	6785
Jul'06								
Aver. %	22.8%	5.5%	37.2%	1.7%	0.1%	28.1%	4.6%	100%

The situation in the POR is similar to the IOR but with less Coastal warnings and more NAVAREA/METAREA warnings/forecasts and number of met/nav warnings to circular and rectangular areas.

3. Quality of Maritime Safety Information

As it was reported at the previous CPRNW meetings, the Inmarsat Maritime Safety Services department periodically monitors the quality of MSI in the AOR-E, AOR-W and IOR. MSI samples from the POR are kindly provided by AMSA. Received messages are analysed and recommendations are given to MSI providers if quality related problems are detected.

MSI monitoring shows that the main problems are with improper use of C1 priority code, C2 service code and C3 repetition code contrary to the requirements of the SafetyNET manual.

As reported last year, the MSI provider for area XIII is still using the service code C2 = 04 – “Nav warnings to rectangular area” to address three types of MSI: NAVAREA warnings, coastal warnings and meteorological information.

Improper use of “C” codes does not affect reception of MSI but it may result in reception of multi-repeated messages and inconsistency between the header of the message and its content.

Inmarsat did not receive any major complaints in the last 12 month from maritime customers on the quality of MSI except some complaints about reception of multi-repeated or unwanted messages. However, reception of unwanted messages may be due to improper EGC set up on mobile terminals.

4. IMO International SafetyNET Manual changes

Inmarsat proposed its corrections to the Manual and these were submitted to the SafetyNET Panel. This paragraph covers only substantive changes to the Manual and does not cover editorials:

- New figure 1 – “The International SafetyNET Service System”. Amended as from CPRNW draft to IMO Resolution A.705(15).
- New figure 2 – “Basic concept of the Inmarsat EGC system”. New EGC SafetyNET and FleetNET information providers are added.
- Figure 3 – “NAVAREAs/METAREAs with Inmarsat global coverage”. Amended with the new locations for AOR-W and IOR satellites. New position for the AOR-W satellite is 53° degrees W and for the IOR 64° E.
- Paragraph 2 “Definitions”. New terms are added and put in alphabetical and logical order. Information on Inmarsat mini-C is also added.
- Annex 1 – “International SafetyNET Co-ordinating Panel”. It is proposed to include Inmarsat to the list of observers on the Panel.
- Annex 2 – “Annex to IMO Assembly Resolution A.664(16)”. The resolution was adopted on the 19 October 1989 before the Inmarsat C service started. It is proposed that the revision of the resolution should be considered.

- Annex 4 – “Operational guidelines”. Service code C2 = 24 - Met warnings to a circular area is defined for meteorological services only. It is proposed that the code should be used for navigational services too.
- Annex 4 – “Operational guidelines”. Section F “Weather graphical services” is added saying the weather graphical data may be broadcast via SafetyNET in the future and the service is under evaluation.
- Annex 6 – “EGC receiver specifications”. New relevant documents on EGC SafetyNET are added to the existing list of documents. Some information is deleted since it does not have any relevance for users.
- Annex 7 – “IMO requirements for the availability of the EGC receive facility”. It is proposed to delete the annex because:
 1. *it is not a requirement, it is only recommendation adopted by IMO in January 1988 before the Inmarsat C service was launched in January 1991 and without practical knowledge of the system performance;*
 2. *practice shows that vital Safety NET messages (warnings) are repeated more than 2 times (using category (b) presentation codes, some messages are broadcast more 10-15 times, and the chance to miss them is very low;*
 3. *time table of the EGC scheduled broadcast is available on ships and the crews are aware of the time when required messages will be transmitted and MESs should not be used to transmit messages.*
- Annex 8 – “Authorization and registration of information providers”. Paragraph 4.2 says that Inmarsat will maintain the master list of all registered information providers and circulate the list to IMO, IHO, WMO and all Inmarsat C LES operators. Since Inmarsat is a private company and does not maintain the list, the CPRNW should decide who will maintain the list. (IMO?)
- Annex 8 - “Sample certificate”. Must be changed.

Vladimir Maksimov
 Manager, Maritime Safety Operations
 Maritime Safety Services Department
 Inmarsat
 99 City Road, London EC1Y 1AX, UK
 Tel: +44 20 77281095
 E-mail: vladimir_maksimov@inmarsat.com