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ANALYSIS OF MARITIME SAFETY INFORMATION PROMULGATED VIA THE EGC SAFETYNET SYSTEM AND RECOMMENDATIONS ON IMPROVING ITS QUALITY

1 The Sub-Committee on Radiocommunications and Search and Rescue (COMSAR), at its eleventh session (19 to 23 February 2007) noted that the IHO Commission on the Promulgation of Radio Navigational Warnings (CPRNW) had received reports that there were occurrences of 'C' codes being used incorrectly, i.e., not in accordance with the International SafetyNET Manual. In particular $C_2 = 14$ (shore-to-ship distress alert relay) had been used with "Urgency" priority rather than the obligatory "Distress" priority; SAR messages had been transmitted using $C_2 = 24$ (Met warnings to a circular area), although $C_2 = 34$ and $C_2 = 44$ have been allocated for Search and Rescue Co-ordination traffic; and C_4 repetition code being used incorrectly resulting in messages, especially some long weather messages, being received unnecessarily on more than one occasion.

2 Accordingly, COMSAR 11 analysed the Maritime Safety Information promulgated via the EGC SafetyNET system and recommended measures to improve its quality as set out in the annex.

3 The Maritime Safety Committee, at its eighty-third session (3 to 12 October 2007), endorsed the recommendations of COMSAR 11.

4 Member Governments are invited to bring this analysis and recommendation to the attention of all concerned for information purposes and in particular, to ensure that 'C' codes are used correctly.

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ANNEX

ANALYSIS OF MARITIME SAFETY INFORMATION PROMULGATED VIA THE EGC SAFETYNET SYSTEM AND RECOMMENDATIONS ON IMPROVING ITS QUALITY[1]

This annex gives an analysis of misuse of various 'C' codes by Maritime Safety Information (MSI) providers and recommends operational guidance for them on promulgating meteorological, navigational and search and rescue (SAR) information as required by the International SafetyNET Manual, 2003 edition, Annex 4. Recommendations given in this annex are in accordance with the SafetyNET Manual.

1 EGC SafetyNET Services

The International SafetyNET Manual defines the following services, service codes (types) and message priorities for promulgating Maritime Safety Information (MSI) given in the table:

	EGC SafetyNET service	Service code (type)	Message priority
1	Navigational Warning services	C_2 = 13 – Coastal warnings C_2 = 31 – NAVAREA warnings	C_1 = 1 (Safety) – normally C_1 = 2 (Urgency) – exceptionally at discretion of MSI provider
2	Meteorological services	C_2 = 13 – Met warnings or forecasts to coastal area C_2 = 24 – Met warnings to circular area C_2 = 31 – Met warnings or forecasts to METAREA	C_1 = 1 (Safety) – always for forecasts and warnings) C_1 = 2 (Urgency) – always for urgent tropical cyclone warnings only
3	SAR services: a) shore-to-ship distress alert	C_2 = 14 – Shore-to-ship DA to circular area	C_1 = 3 (Distress) – always
	b) SAR co-ordination traffic	C_2 = 34 – SAR co-ordination to rectangular area C_2 = 44 – SAR co-ordination to circular area	C_1 = 1 (Safety) – determined by the phase of emergency C_1 = 2 (Urgency) – determined by the phase of emergency C_1 = 3 (Distress) – determined by the phase of emergency
	c) shore-to-ship urgency and safety traffic	C_2 = 31 – Urgency and Safety traffic	C_1 = 1 (Safety) C_1 = 2 (Urgency)
	d) general (all ships call within the Inmarsat ocean region)	C_2 = 00	C_1= 2 (Urgency) C_1 = 3 (Distress)
4	Piracy countermeasures broadcast messages	C_2 = 04 – Nav warning to rectangular area	C_1 = 1 (Safety)
5	*Weather graphical service*	*C_2 = 21 – Service not yet developed*	*TBC*
6	*Chart correction service for fixed areas*	*C_2 = 73 – Service not yet developed*	*TBC*

Figure 1. Allocation of service and priority codes for EGC SafetyNET services

[1] The circular (annex) should be read in conjunction with COMSAR/Circ.36, annex 1 "Steps to be taken for the promulgation of tsunami warning and other natural disaster warnings using the international SafetyNET service".

The figure shows that each type of the SafetyNET service is allocated with a certain priority code C_1 and service code C_2, which should be used by all MSI providers.

2 EGC SafetyNET broadcast parameters

To broadcast a SafetyNET message an MSI provider should submit C codes with the message, usually five or six codes, which are known as broadcast parameters and included in the message header. Each C code controls an individual broadcast parameter and is assigned a numerical value in accordance with the International SafetyNET Manual.

The EGC SafetyNET broadcast command syntax is as follows:

EGC C_0, C_1, C_2, C_3, C_4, C_5

Where the word EGC is the start command and:

C_0 – Ocean Region – to identify the ocean region if the addressed Inmarsat C Land Earth Station (LES) operates in more than one ocean region (optional code);

C_1 – Message Priority

C_1 = 1 – Safety priority;
C_1 = 2 – Urgency priority; and
C_1 = 3 – Distress priority

C_2 – Service code – see Figure 1.

C_3 – Address code – consists of 2, 4, 10 or 12 numerical or alpha-numerical characters which define a geographical address for the message. An address may be a fixed area defined by IMO as NAVAREA/METAREA, an MSI provider-defined circular or rectangular area or a coastal area.

C_4 – Repetition code – allows a message to be repeated a finite number of times or at specific intervals until cancelled by the information provider, for example:

C_4 = 01 – transmit once on receipt;
C_4 = 11 – transmit on receipt followed by repeat 6 minutes later; and
C_4 = 19 – transmit broadcast every 24 hours with an echo (repetition) 6 minutes after each broadcast.

More repetition codes are defined in the SafetyNET Manual, Annex 4.

C_5 – Presentation code

C_5 = 0 (or 00) – for the SafetyNET services, the presentation code is always 0 (or 00, subject to the registered LES access procedure).

3 EGC SafetyNET Log

All Inmarsat C Mobile Earth Stations (MESs), capable of receiving MSI, have an EGC Log, which contains information on all SafetyNET messages received by the terminal.

Disk Filename	Modem Filename	LES	Service	Priority	Bits	Date & Time	Size	Ref.No.	Routing
07012405.egc	**EGC.915**	**321**	**MET/NAV Warning/Forecast**	**Safety**	**7 Bit IA5**	**07-01-24 04:31**	**2159**	**1409**	**Prn+Mem**
07012403.egc	EGC.913	321	SAR Coordination	Safety	7 Bit IA5	07-01-24 04:03	1561	1408	Prn+Mem
07012211.egc	EGC.854	304	Distress Alert Relay	Distress	7 Bit IA5	07-01-23 01:14	732	9153	Prn+Mem
07012210.egc	EGC.829	322	Coastal Warning/Forecast	Safety	7 Bit IA5	07-01-22 22:04	232	739	Prn+Mem
07012207.egc	EGC.826	317	NAV Warning	Safety	7 Bit IA5	07-01-22 21:03	2260	681	Prn+Mem
07012206.egc	EGC.825	322	MET Warning	Safety	7 Bit IA5	07-01-22 20:46	614	3570	Prn+Mem

Figure 2. Example of the EGC Log

This information includes:

- Disk/Modem File name of the received message (given by the MSI);
- LES ID – retrieved from the received message;
- Service type – how MES's software translates C_2 service code and it is retrieved from the message address;
- Priority (Safety, Urgency or Distress) – how MES's software translates priority code C_1 and it is retrieved from the message address;
- Presentation code (7-bit ASCII code) – how MES's software translates presentation code C_5 and it is retrieved from the message address;
- Message size – usually in number of bits or characters;
- Date/time when the message was received;
- Message reference number – unique number given by the addressed LES; and
- Message routeing (memory or memory and printer) – set up by the MES operator or a mandatory routeing for Urgency and Distress priority messages.

***Note**: Messages shown in **bold** are unread. Messages displayed in red colour are SafetyNET messages broadcast with Urgency (P_2) and Distress (P_3) priorities.*

Each C_2 service code has a unique "decoding" by Inmarsat C software, which is presented in the EGC log and message header when it is displayed on the screen or printed.

- C_2 = 00 – General Call
- C_2 = 04 – Nav Warning
- C_2 = 13 – Coastal Warning/Forecast
- C_2 = 14 – Distress Alert Relay
- C_2 = 24 – Met Warning *(see note below)*
- C_2 = 31 – MET/NAV Warning/Forecast
- C_2 = 34 – SAR Co-ordination
- C_2 = 44 – SAR Co-ordination

***Note**: These "translations" of service codes may vary between different manufactures of MESs. Service code C_2=24 may be decoded as "Met/Nav Warning" in the header of received messages.*

4 Monitoring of MSI and misuse of C-codes

Monitoring of MSI broadcast in the Atlantic Ocean Region – East (AOR-E), Atlantic Ocean Region – West (AOR-W), Indian Ocean Region (IOR) and Pacific Ocean Region (POR) shows that some MSI providers do not follow IMO requirements (recommendations) and misuse C_1 (priority), C_2 (address) and C_4 (repetition) codes. This results in misunderstanding of MSI service/type, multiple reception of unwanted messages, delay in reacting to vital information and its reception on ships, etc.

4.1 Improper use of C_1 priority codes

This refers mainly to C_2=14 "Ship-to-Shore distress alerts" which require using C_1=3 **Distress** priority code only. When a message is received on a ship, the header of the message is displayed and printed as:

- LES xxx - MSG 1210 – **Distress Urgent** Call to Area: 14N 66W 300 – PosOK, where:

  – LES xxx – ID of the LES;
  – MSG 1210 – Reference number of the message;
  – **Distress** Call to Area – decoding of C_2=14 code;
  – **Urgent** – decoding of C_2=2 code;
  – 14N 66W 300 – circular position the message was sent to, where 14N 66W – centre of the circle and 300 is radius of the circle in nautical miles; and
  – PosOK – indicator that the MES's position status is valid or the position was updated within the last 12 hours.

The message header contains reference to two different priorities – Distress and Urgent (the same refers to the EGC log, see Figure 1), which misleads mariners about the message importance and its content. It is an important issue, particularly for non-SOLAS users, where an EGC message with Urgency and Distress priority may NOT be printed out automatically and there might be some delays in reacting to the vital information.

If a message is submitted with P_2 (Urgency) priority and another message is sent with P_3 (Distress) priority afterwards, the P_2 priority message will be aborted and the P_3 priority message will be handled first. It means that a message with the distress priority content but sent with the urgency priority may be delayed in reaching its destination.

4.2 Improper use of C_2 service codes

There are cases when MSI providers submit EGC SafetyNET message using improper C_2 service codes and a sample is given below:

> LES xxx – MSG 5213 – **Met/NavWarn Urgent Call** to Area: 35N 23E 300 – PosOK
> FROM: MRCC xxx
> TO: ALL SHIPS IN SOUTHEAST MEDITERRANEAN SEA
>
> **SAR SITREP NO: 02**
>
> FISHING BOAT 'xxx' WITH THREE PERSONS ON BOARD DEPARTED FROM xxx ISLAND ON xxx AT NOONTIME AND SINCE THEN NO INFORMATION ABOUT HER.

PARTICULARS … SHIPS SAILING IN VICINITY ARE KINDLY REQUESTED TO KEEP A SHARP LOOK OUT INFORMING MRCC
REGARDS
DUTY OFFICER

The message was sent using service code C_2 = 24 "Met/Nav warning to circular area" as shown in the message header but the message content is a Search and rescue co-ordination message as shown in the message. It may delay delivery of the vital SAR information and jeopardize safety of life at sea.

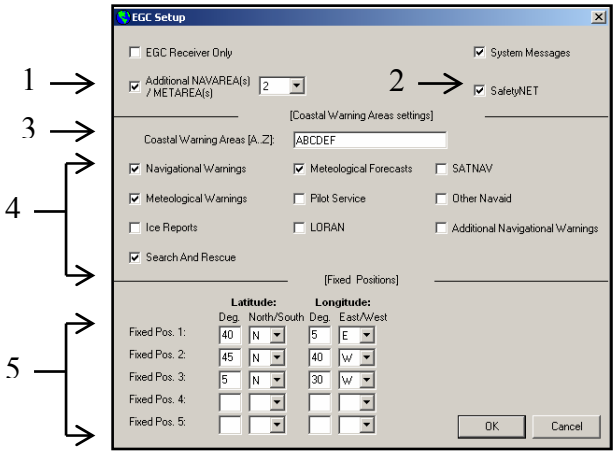
Some MSI providers use improper service codes when compiling their information and many ships therefore receive unwanted information for the areas where these ships **may never navigate**.

Another example is using rectangular addressing, e.g., service code C_2 = 04, for coastal warnings whereby the addressed rectangular area covers areas far beyond coastal areas.

Reception of EGC SafetyNET Coastal Warnings is an option and to receive these messages, MESs should be programmed or set up accordingly, otherwise Coastal warnings will not be received, regardless of the ship's position. If a coastal warning-type message is addressed to a rectangular area, **ALL** ships, whose position is inside the addressed rectangle, will receive the message. The main problem here is not only misusing service codes, which are specified by the International SafetyNET Manual, but reception (and printing) of multiple unwanted messages which ships may never require.

***Note**: Coastal Warnings broadcast via the EGC SafetyNET service is not available in all NAVAREAs/METAREAs and its availability should be checked with local MSI providers, Chairman of the SafetyNET Co-ordinating Panel of through national or International Lists of Radio Signals.*

It is important to remind SafetyNET users how to set up a ship's terminal to receive MSI which is required during the voyage.



Legend:

1. Setting additional (secondary) NAVAREA/ METAREA to receive MSI to an additional area. It may be more than one area on some MES models and software versions.
2. EGC SafetyNET service selection and it is always active on SOLAS compliant MESs.
3. Coastal Warning Areas B_1 codes, value A-Z and available in the International Lists of Radio Signals.
4. Coastal Warning message type B_2 codes, A – nav warnings, B – met warnings, C – ice reports, D – SAR info, E- met forecasts, F – pilot service, H – LORAN service, H – SATNAV messages, K – other navaid messages, L – additional nav warnings.
5. Up to 5 fixed positions to receive additional MSI for areas beyond the current position given by MES.

Figure 3. EGC Setup screen (may vary between different MES models)

***Note**: All MSI, which is addressed to NAVAREA/METAREA, rectangular or circular area, will be received by ships if the ship's position is INSIDE the addressed area. Geographical boundaries of all NAVAREA/METAREA are coded into MESs' firmware and all ships' "know" which area the ship is in, so these messages will be received automatically.*

4.3 Improper use of C_4 repetition codes

The International SafetyNET Manual defines various repetition codes which are used by MSI providers to "instruct" the Inmarsat C system to repeat a International SafetyNET message a finite number of times or at specific intervals until cancelled by the information provider.

MSI is submitted for broadcast with repetitions, either 6 minutes later (or with 6 minutes "echo") after initial broadcast or every 1, 2, 3, 4,…48,… or 120 hours until cancelled by the MSI provider. Each message, when submitted for broadcast, is given a reference number (see paragraph 3). When the message is received by the MES, the reference number is "recorded" by the mobile terminal and stored in the memory. When the same message is re-broadcast later, using any C_4 repetition codes, MESs receive it and "recognize" the reference number by cross-checking the list of numbers of already received messages. In this case, the message will not be printed out for a second time.

***Note**: An EGC message, which requires a multiple broadcast, should be addressed with the proper repetition code and requires only a single submission to the LES. The process of repeated broadcast will be controlled by the repetition code.*

When the same SafetyNET message is submitted for broadcast for a second (or third or more) time, the addressed LES will give the message another reference number and mobile terminals will not be able to "recognize" it as the same message. In this case each subsequent message submitted to the LES for repetition will be received by MESs and printed out.

The SafetyNET monitoring shows that some MSI providers do not use the recommended repetition code and in this case MESs receive and print unwanted numbers of messages, which will fill up the MES's memory rather quickly and waste printing paper.

***Note**: Some MSI is broadcast only once on receipt using repetition code $C_4 = 01$.*

Below is an example of the same weather forecast submitted for broadcast twice and having two different reference numbers:

> LES xxx – MSG 1032 – MetWarn/Fore Safety Call to Area: xx – PosOK
> xxx CSAT 23423440010402 xx-NOV-2006 09:55:41 103000
> SECURITE
> HIGH SEAS BULLETIN FOR METAREA xx ISSUED AT 0800 ON xx NOV 2006 BY THE MET OFFICE …
>
> LES xxx – MSG 1033 – MetWarn/Fore Safety Call to Area: xx – PosOK
> xxx CSAT 23423440010402 xx-APR-2006 10:10:13 103453
> SECURITE
> HIGH SEAS BULLETIN FOR METAREA xx ISSUED AT 0800 ON xx NOV 2006 BY THE MET OFFICE

The message (size about 4,800 characters) was received and printed twice since it was submitted to the LES for broadcast twice and was given two separate reference numbers – 103000 and 103453.

If the message had been submitted once with, for example C_4=11 (transmit on receipt followed by repeat 6 minutes later), it would have been given one reference number and received and printed only once.

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