COSPAS-SARSAT
DATA DISTRIBUTION PLAN

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COSPAS SARSAT

COSPAS-SARSAT DATA DISTRIBUTION PLAN

History

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LIST OF PAGES

Page #	Date of latest revision	Page #	Date of latest revision	Page #	Date of latest revision	Page #	Date of latest revision
cover	Oct 11	II / B-1	Oct 10	II / B-KO-2	Oct 11	III / A-2	Oct 11
i	Oct 11	II / B-2	Oct 10	II / B-NI-1	Oct 10	III / A-3	Oct 11
ii	Oct 11	II / B-AE-1	Oct 10	II / B-NI-2	Oct 10	III / A-4	Oct 11
iii	Oct 10	II / B-AE-2	Oct 10	II / B-NO-1	Oct 10	III / A-5	Oct 11
iv	Oct 10	II / B-AL-1	Oct 10	II / B-NO-2	Oct 10	III / A-6	Oct 11
v	Oct 10	II / B-AL-2	Oct 10	II / B-PA-1	Oct 10	III / A-7	Oct 11
vi	Oct 10	II / B-AR-1	Oct 10	II / B-PA-2	Oct 10	III / A-8	Oct 11
		II / B-AR-2	Oct 10	II / B-PE-1	Oct 10	III / A-9	Oct 11
1-1	Oct 10	II / B-AR-3	Oct 10	II / B-PE-2	Oct 10	III / A-10	Oct 11
1-2	Oct 10	II / B-AR-4	Oct 10	II / B-SA-1	Oct 10	III / A-11	Oct 11
		II / B-AS-1	Oct 10	II / B-SA-2	Oct 10	III / A-12	Oct 11
2-1	Oct 10	II / B-AS-2	Oct 10	II / B-SI-1	Oct 10		
2-2	Oct 10	II / B-AU-1	Oct 10	II / B-SI-2	Oct 10	III / B-1	Oct 11
2-3	Oct 10	II / B-AU-2	Oct 10	II / B-SP-1	Oct 10	III / B-2	Oct 11
2-4	Oct 10	II / B-AU-3	Oct 10	II / B-SP-2	Oct 10	III / B-3	Oct 11
		II / B-AU-4	Oct 10	II / B-SP-3	Oct 10	III / B-4	Oct 11
3-1	Oct 10	II / B-BR-1	Oct 10	II / B-SP-4	Oct 10	III / B-5	Oct 11
3-2	Oct 10	II / B-BR-2	Oct 10	II / B-TA-1	Oct 10	III / B-6	Oct 11
3-3	Oct 10	II / B-BR-3	Oct 10	II / B-TA-2	Oct 10	III / B-7	Oct 11
3-4	Oct 10	II / B-BR-4	Oct 10	II / B-TH-1	Oct 10	III / B-8	Oct 11
3-5	Oct 10	II / B-CA-1	Oct 10	II / B-TH-2	Oct 10	III / B-9	Oct 11
3-6	Oct 10	II / B-CA-2	Oct 10	II / B-TR-1	Oct 10	III / B-10	Oct 11
3-7	Oct 10	II / B-CH-1	Oct 10	II / B-TR-2	Oct 10	III / B-11	Oct 11
3-8	Oct 10	II / B-CH-2	Oct 10	II / B-TR-3	Oct 10	III / B-12	Oct 11
3-9	Oct 10	II / B-CN-1	Oct 10	II / B-TR-4	Oct 10	III / B-13	Oct 11
3-10	Oct 10	II / B-CN-2	Oct 10	II / B-UK-1	Oct 10	III / B-14	Oct 11
3-11	Oct 10	II / B-CO-1	Oct 10	II / B-UK-2	Oct 10	III / B-15	Oct 11
3-12	Oct 10	II / B-CO-2	Oct 10	II / B-US-1	Oct 11	III / B-16	Oct 11
3-13	Oct 10	II / B-FR-1	Oct 11	II / B-US-2	Oct 11	III / B-17	Oct 11
3-14	Oct 10	II / B-FR-2	Oct 11	II / B-US-3	Oct 11	III / B-18	Oct 11
3-15	Oct 10	II / B-FR-3	Oct 11	II / B-US-4	Oct 11	III / B-19	Oct 11
3-16	Oct 10	II / B-FR-4	Oct 11	II / B-VN-1	Oct 10	III / B-20	Oct 11
3-17	Oct 10	II / B-GR-1	Oct 11	II / B-VN-2	Oct 10	III / B-21	Oct 11
3-18	Oct 10	II / B-GR-2	Oct 11	II / B-VZ-1	Oct 10	III / B-22	Oct 11
		II / B-GR-3	Oct 11	II / B-VZ-2	Oct 10	III / B-23	Oct 11
I / A-1	Oct 11	II / B-GR-4	Oct 11			III / B-24	Oct 11
I / A-2	Oct 11	II / B-HK-1	Oct 11	II / C-1	Oct 11	III / B-25	Oct 11
		II / B-HK-2	Oct 11	II / C-2	Oct 11	III / B-26	Oct 11
I / B-1	Oct 10	II / B-ID-1	Oct 11			III / B-27	Oct 11
I / B-2	Oct 10	II / B-ID-2	Oct 11	II / D-1	Oct 11	III / B-28	Oct 11
		II / B-IN-1	Oct 10	II / D-2	Oct 11		
II / A-1	Oct 11	II / B-IN-2	Oct 10	II / D-3	Oct 11	III / C-1	Oct 10
II / A-2	Oct 11	II / B-IT-1	Oct 10	II / D-4	Oct 11	III / C-2	Oct 10
II / A-3	Oct 11	II / B-IT-2	Oct 10	II / D-5	Oct 11		
II / A-4	Oct 11	II / B-JA-1	Oct 10	II / D-6	Oct 11	III / D-1	Oct 10
		II / B-JA-2	Oct 10			III / D-2	Oct 10
		II / B-KO-1	Oct 11	III / A-1	Oct 11		

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

LIST OF TABLES

LIST OF FIGURES

TABLE OF CONTENTS (Cont.)

LIST OF ANNEXES

PART I : Reference Information

PART II : Cospas-Sarsat Space and Ground Segment Description

TABLE OF CONTENTS (Cont.)

1. INTRODUCTION

1.1 Overview

The purpose of the Cospas-Sarsat System is the provision of distress alert and location data for search and rescue (SAR), using spacecraft and ground facilities to detect and locate the signals of Cospas-Sarsat distress radiobeacons operating on 406 MHz. The position of the distress and other related information is transmitted to appropriate SAR authorities by the responsible Cospas-Sarsat Mission Control Centre (MCC).

1.2 Document Objective

The Cospas-Sarsat System is operated in accordance with the 1988 International Cospas-Sarsat Programme Agreement (ICSPA) and related documents. The purpose of this document is to:

- establish basic data distribution principles; and
- define the corresponding procedures to be implemented by Cospas-Sarsat MCCs for distributing Cospas-Sarsat alert data and System information.

1.3 Document Organization

The Cospas-Sarsat policy with regards to MCC operations is contained in the text of this Cospas-Sarsat Data Distribution Plan (DDP).

A brief description of the Cospas-Sarsat operational concept is given in section 2. Section 3 describes the basic approach for exchanging System information between MCCs and distributing to Rescue Coordination Centres (RCCs) or other SAR points of contact (SPOCs) alert data and notification of country of beacon registration (NOCR) messages.

The Annexes to this DDP provide:

a) pertinent information needed by MCCs to support daily operational activities (Part I);

b) a description of the Cospas-Sarsat Space and Ground Segments (Part II); and

c) a detailed description of the operational procedures to be applied by MCCs (Part III).

Except for the operational procedures (Part III) which cannot be changed without appropriate coordination with all MCC Operators, other operational information in the Annexes to the Data Distribution Plan (Parts I and II) is subject to change and needs to be kept current between scheduled Cospas-Sarsat Council (CSC) sessions.

1.4 Document Amendments and Updates

Amendments to the main text of the DDP and the operational procedures in Part III of the DDP Annexes shall be approved by the CSC.

Each page of the document includes in its header an Issue number, a Revision number and the date of the revision. The last revision date of each page of the document is listed in a summary page updated with each new revision.

Users of this Cospas-Sarsat Data Distribution Plan should ensure that their copy of the document includes all the revisions issued by the Cospas-Sarsat Secretariat, as indicated in the History page (i) and the List of Pages (iii) which precede this section.

1.5 Reference Documents

a) C/S A.002 (SID) Cospas-Sarsat Mission Control Centres (MCC) Standard Interface Description.

b) C/S A.003 Cospas-Sarsat System Monitoring and Reporting.

c) C/S A.005 Cospas-Sarsat Mission Control Centre Performance Specification and Design Guidelines.

d) C/S G.004 Cospas-Sarsat Glossary.

e) C/S T.002 Cospas-Sarsat Local User Terminal Performance Specification and Design Guidelines.

f) C/S T.004 Cospas-Sarsat LEOSAR Space Segment Commissioning Standard.

g) C/S P.011 Cospas-Sarsat Programme Management Policy.

- END OF SECTION 1 -

2. GENERAL OPERATIONAL CONCEPT

2.1 General Alert Data Flow

The distribution of Cospas-Sarsat alert data throughout the world is summarized as follows:

- the LUTs receive the beacon signals relayed by the satellites; and
- the signals are processed and alert data is sent to the associated MCC for distribution.

Each MCC distributes alert data according to this Cospas-Sarsat Data Distribution Plan (DDP), and according to its own unique requirements and procedures, to any country within its service area which has agreed to accept such services. Alert data is provided to SPOCs, which are RCCs or other recognized national points of contact that will use the data to enable fast and effective rescue of persons in distress.

Any MCC receiving alert data relating to a distress beacon located outside its service area will relay that information to another MCC in accordance with the principles listed in section 2.2 and the agreed procedures detailed in this DDP.

2.2 Alert Data Distribution Principles

The exchange of alert data between MCCs in the Cospas-Sarsat System and its distribution to RCCs or SPOCs is based on the following principles:

Cospas-Sarsat alert data should be:

- validated at the MCC to ensure the reliability of distress information provided to RCCs and SPOCs;
- distributed in a timely manner to the appropriate RCC or SPOC, as determined by the geographical sorting of the distress location; and
- provided to SPOCs in accordance with the applicable Cospas-Sarsat procedures, or procedures agreed bilaterally between an MCC and the SPOCs in its service area.

In the case of maritime emergencies, any MCC not able to deliver the alert to the responsible SPOC should forward the alert to a RCC in the same country as the MCC.

In the case of aeronautical emergencies, any MCC not able to deliver the alert to the responsible SPOC should deliver the alert to an ARCC in the same country as the MCC, and could also consider contacting the control tower of an international airport in the country concerned.

In addition, MCCs should follow the Cospas-Sarsat agreed procedures to:

- filter out redundant alert messages;
- resolve the ambiguity of distress locations and notify all recipients of incorrect positions after ambiguity has been resolved; and
- ensure through appropriate backup arrangements, the uninterrupted distribution of alert data.

2.3 Service Area of Cospas-Sarsat MCC

An MCC's service area is that part of the world within which a Cospas-Sarsat alert data distribution service is provided by that MCC, in accordance with document C/S P.011 “Cospas-Sarsat Programme Management Policy”.

An MCC service area is defined by the list of SPOCs to which that MCC distributes Cospas-Sarsat alert data. The list of countries / regions included in the service area of each MCC is provided at Annex II / B of this DDP.

Nothing in this DDP or other Cospas-Sarsat System documents prevents the parties from adopting other arrangements more suitable for the distribution of Cospas-Sarsat alert data at some future date.

It is essential that MCCs establish appropriate arrangements with all the countries / SPOCs in their service area on communication links to be used for the distribution of alert data. If such arrangements have not been made for a particular country in the MCC service area, the MCC shall notify its own national SAR authorities of any Cospas-Sarsat alert in that country's SRR, for handling in accordance with national SAR procedures.

As new SPOCs are identified, either through agreements with Cospas-Sarsat or via other channels, they will be incorporated into existing MCC service areas by mutual consent of the SPOC national authority and the appropriate MCCs. All MCCs should be notified of new SPOCs.

2.4 Data Distribution Regions

A data distribution region (DDR) comprises two or more MCC service areas. Cospas-Sarsat alert data and System information are exchanged between DDRs through a single MCC which acts as the point of contact for that DDR. This MCC is identified as the nodal MCC of the DDR. However, bilateral arrangements can be implemented between adjacent MCC service areas included in different DDRs to facilitate the exchange of alert data in overlapping service areas or adjacent search and rescue regions.

The DDR structure of the Cospas-Sarsat data distribution network is defined at Annex III / A of the DDP, together with the specific arrangements for the exchange of alert data in each DDR.

2.5 General Flow of System Information

System information assists in the operation of the Cospas-Sarsat System. This information includes Cospas-Sarsat satellite ephemeris and time calibration data that affect location processing, messages used for commanding the satellite SAR instruments, and notification messages providing the status of System elements. The flow of System information through the Cospas-Sarsat System is detailed in section 3.5.

- END OF SECTION 2 -

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3. PROCEDURES

3.1 General Procedures for the Distribution of Cospas-Sarsat Alert Data

3.1.1 Introduction

Alert data is the generic term for Cospas-Sarsat alert and location data derived from 406 MHz distress beacon signal processing. Alert data derived from beacon signals may contain beacon position information and other coded information, including the beacon identification.

MCCs receive alert data from their LUTs or from other MCCs and distribute this alert data to the appropriate RCC or SPOC in their service area, or forward the alert data to another MCC. Alert data received from a single satellite pass or in a single MCC message shall be processed in TCA or detection time order. MCCs should transmit Cospas-Sarsat alert data in accordance with the principles for data distribution listed in section 2.2 of this Cospas-Sarsat Data Distribution Plan (DDP). The corresponding procedures are outlined in Figures 3.1 and 3.2, and in the following sections. These procedures are further detailed at Annex III / B of this DDP."

3.1.2 Geographical Sorting of Alert Data

Alert data are distributed according to the geographical sorting of the available position(s). The geographical distribution of alert data is organized as follows:

a) Beacon position is within an MCC's service area:

An MCC that receives alert data for a beacon position in its own service area forwards the alert data to the appropriate SPOC or national RCC, in accordance with the applicable Cospas-Sarsat or national procedures.

b) Beacon position is within another MCC's service area:

An MCC that receives alert data for a beacon position in another MCC's service area forwards the alert data to the appropriate MCC, in accordance with the applicable Cospas-Sarsat procedures as described in the Annexes III / A and III / B to this DDP.

c) Unlocated alerts:

There will be occasions when a LEOLUT is unable to calculate a location for a beacon or a beacon is detected by a GEOLUT, and the only information available is the beacon message. If this data does not contain an encoded position, the alert is unlocated. In these cases the only information available will be the digital identification contained in the beacon message which includes a country code

designating the country of registration of the beacon. MCCs will transmit this information to the country of registration according to the procedure described in section 3.2.8.

3.1.3 Message Formats

Alert messages are exchanged between MCCs using standard formats which permit automatic processing and retransmission of all data. These message formats are referenced in the Cospas-Sarsat Mission Control Centres Standard Interface Description (C/S A.002). A list of message formats that are implemented at each MCC is provided at Annex II / C of this DDP.

3.1.4 Beacon Identification

MCCs when transmitting narrative messages and making reference to beacon identification should take particular care in providing the identification as 15 contiguous hexadecimal characters comprising bits 26 to 85 of the beacon message. If a location protocol beacon is involved, the coarse position fields must be set to the specified default values.

Figure 3.1: 406 MHz Alert Data Distribution Procedures (1/2)

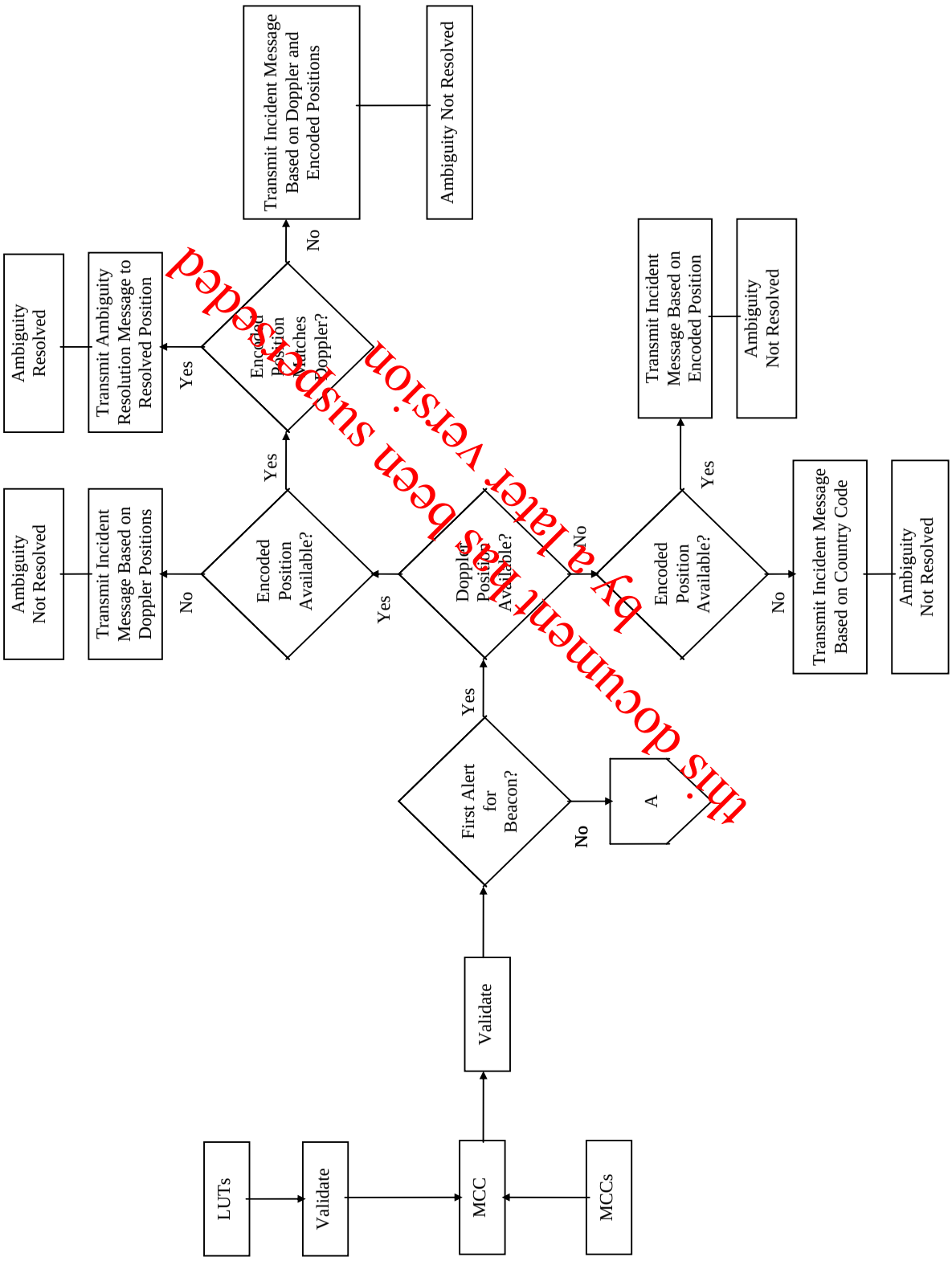
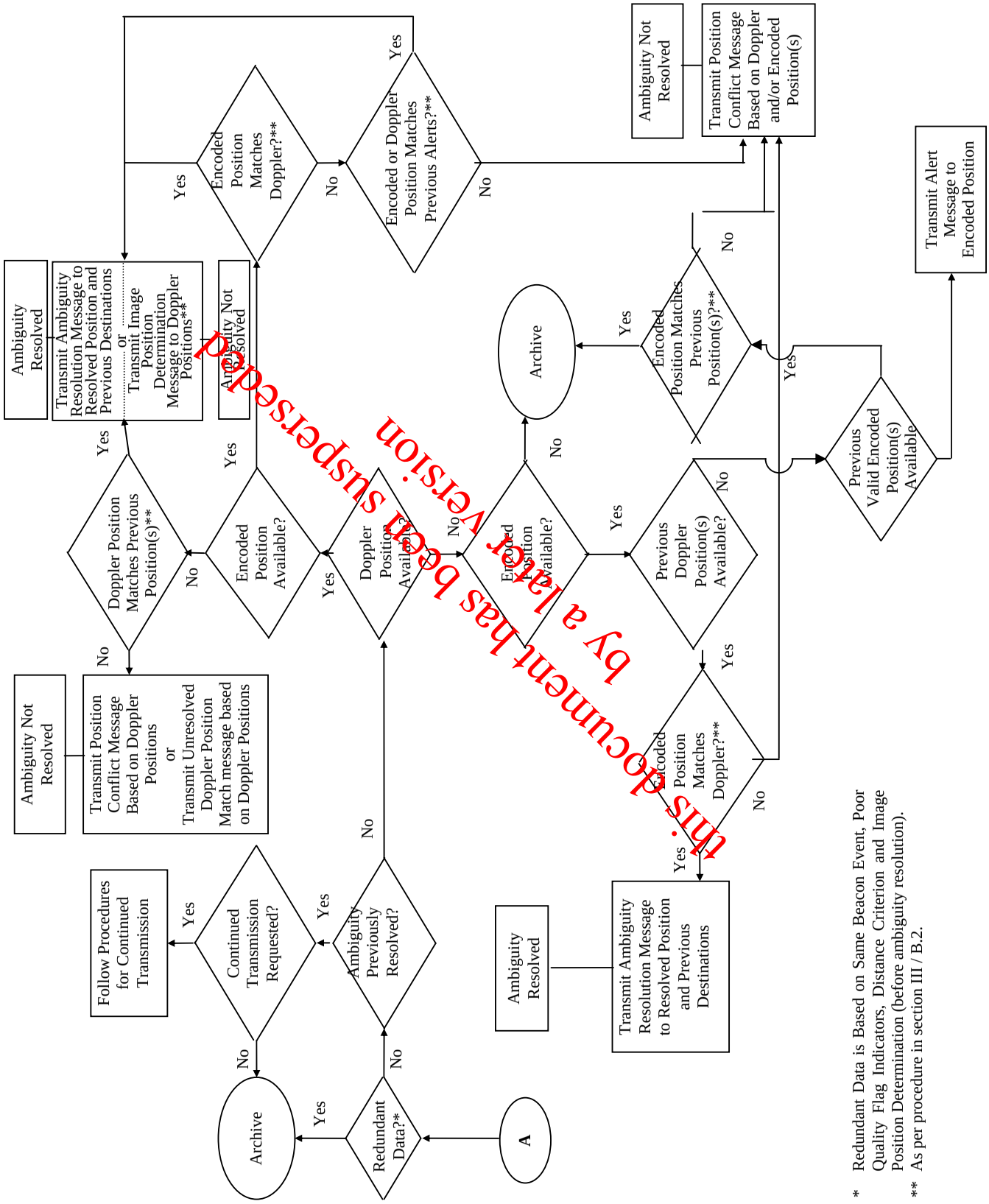


Figure 3.1: 406 MHz Alert Data Distribution Procedures (2/2)



3.2 406 MHz Alert Data Distribution Procedures

3.2.1 Doppler Locations and Encoded Positions

Position data provided by Doppler processing of 406 MHz signals relayed through Cospas-Sarsat satellites and position data encoded in beacon messages which are relayed through Cospas-Sarsat low earth orbit (LEO) satellites or Cospas-Sarsat geostationary earth orbiting (GEO) satellites, constitute independent sources of beacon position information. Both types of position data are used by MCCs in the filtering and geographical sorting process, and distributed with alerts to RCCs and / or SPOCs, in accordance with the procedures described hereunder.

Location data provided by LEOLUT Doppler processing shall not be removed or altered by a distributing MCC, unless the Doppler location fails Doppler footprint validation.

3.2.2 Validation of Beacon Message Data

Under various circumstances such as interference, weak beacon signals or high noise levels, the LUT processing can produce erroneous alert data (i.e. processing anomalies) which may cause false alerts.

The alert data produced by the LUTs must be validated in accordance with the requirements of document C/S T.002. In addition, to avoid propagating invalid alerts through the Cospas-Sarsat Ground Segment, the procedure for validating alert data described at Annex III / B of this DDP should be implemented at the MCC level to satisfy the requirements of document C/S A.005.

3.2.3 Filtering of Redundant Data

After validation, alert data received by an MCC must be compared to previous information concerning the same beacon identification which has already been processed by that MCC. Alert data produced by LEOLUTs for the same beacon event (i.e. same beacon identification, same spacecraft and same time of closest approach (TCA) $\pm$ 20 minutes) is deemed to be redundant if, using the distance criterion defined at Annex III / B of this DDP, either:

a) the new alert message does not include Doppler position data and the encoded position matches encoded position information received earlier by the MCC; or

b) the new alert message includes Doppler position data, each Doppler position in the new alert matches a Doppler position in an alert received previously for the same beacon event and, either:

- the new alert message does not include encoded position data, or
- the encoded position data in the new alert message matches encoded position information received earlier by the MCC; or

c) an alert with the same beacon ID has already been processed for the same beacon event and the new alert message does not include Doppler position data or encoded position data.

Before ambiguity resolution, data for the same beacon event should not be considered redundant if it contains information on image position determination not previously received (see document C/S A.002, Appendix B.2 to Annex B).

Alert data produced by GEOLUTs for the same beacon identification is deemed to be redundant if:

a) the new alert message does not include encoded position data; or

b) the encoded position data in the new alert message matches encoded position data received in an earlier message, using the distance matching criterion defined at Annex III / B of this DDP.

To minimize redundant message traffic in the Ground Segment, MCCs must not distribute alert data which have been determined as redundant in accordance with the procedure described at Annex III / B of this DDP.

The matching test for new encoded position data shall be performed with all encoded position data previously received and forwarded (i.e. not deemed redundant) for the same ID, without respect to whether the new position is coarse (i.e. without usable encoded position in the second protected field of the beacon message) or refined (i.e. with usable encoded position in the second protected field of the beacon message). However, the matching test for a coarse encoded position shall also be performed with the position derived from the first protected field of previous non-redundant messages: a coarse encoded position will be deemed redundant if it matches the position encoded in the first protected field of a previous beacon message.

Data deemed to be redundant shall not be used to determine whether subsequent data is redundant.

3.2.4 Ambiguity Resolution of 406 MHz Positions

The objective of the ambiguity resolution process is to confirm the position of a beacon on the basis of information provided by two independent sources.

A Doppler location always includes two sets of position data, the ‘true’ and the ‘image’ solutions which are symmetrical relative to the trace of the orbit. Each solution is associated with a probability which is generally sufficient to resolve the Doppler ambiguity. However, the actual characteristics of the 406 MHz transmission are not known by the receiving LUT and reliable ambiguity resolution of the Doppler solutions can only be achieved with a set of Doppler positions from two different beacon events, or using an external source of data such as position data encoded in the beacon message.

A beacon message with encoded position data provides a unique position which may be very accurate in most circumstances. However, since the source of that position data is not under the control of Cospas-Sarsat, errors could remain undetected and confirmation of the encoded position via an independent source is also desirable. As several alert messages from the same beacon received through different satellites and/or different LUTs can all originate from the same beacon transmission and, therefore, from the same navigational data, confirmation of encoded position data can only be provided by a Doppler solution matching the encoded position.

Therefore, independent position information will consist of either a:

a) Doppler positions obtained from two different beacon events; or

b) Doppler position and encoded position data.

The beacon position ambiguity is resolved only if two independent sets of position data match the distance criterion specified at Annex III / B of this DDP.

Alert data for beacons located outside an MCC's service area will be forwarded until ambiguity is resolved. Once ambiguity is resolved, an ambiguity resolution message shall be transmitted to each MCC and/or SPOC that has the resolved position or a previous image position in its MCC service area, or its SAR Region(s), respectively.

3.2.5 Continued Transmission after Ambiguity Resolution

If necessary, continued transmission of alert data after ambiguity resolution may be requested by an MCC.

Alert data transmitted after ambiguity resolution should not be geographically sorted according to the received position, but sent to the same MCC, SPOC or RCC which received the alert for the confirmed beacon position or requested the continued transmission.

In satisfying a request for continued transmission of alert data for a specified beacon identification, the same method of filtering redundant data used before ambiguity resolution should also be used after ambiguity resolution.

3.2.6 Exchange of Ship Security Alerts

Ship security alerts are initiated and transmitted by vessels whose security is threatened and who need to notify a competent authority designated by the flag state. The transmission of ship security alerts is based on the country code contained in the beacon identification, which is then used to route the alert to the appropriate MCC or competent authority.

MCCs will exchange ship security alerts using the formats specified in the document C/S A.002 and according to the ship security alert distribution procedures described in Annex III / B of this DDP.

An MCC will transmit a ship security alert only to the MCC or competent authority associated with the country code. An MCC will not transmit a ship security alert to the RCC or SPOC associated with the location of the alert.

3.2.7 Requesting Transmission of Alerts

MCCs, SPOCs or RCCs may request transmission of alerts by geographical area or 15 hexadecimal beacon identifier.

If the request is by geographical area, then the request should specify the area for which new alerts would be provided, either as a radius in nautical miles around a position or as a rectangle defined by two opposing corner positions.

The request should indicate the MCCs that would receive alerts for that area in real time. A nodal MCC that receives a request for transmission should forward the request to the appropriate MCCs, to ensure that the requested alerts are sent.

The requesting agency should indicate when transmissions are to be discontinued.

3.2.8 Exchange of Unlocated Alerts

When a LEOLUT is unable to calculate a location for a beacon, or a beacon message is detected by a GEOLUT, the only information available is the beacon message. If this data does not contain an encoded position, the alert is unlocated. An unlocated alert shall be distributed using the country code in the beacon identification for routing to the appropriate MCC or SPOC. Unlocated alerts shall be validated at LUT and MCC level in accordance with the applicable procedure.

MCCs will exchange unlocated alert messages using the format specified in the document C/S A.002 and according to the alert distribution procedures described in Annex III / A of this DDP.

An MCC will transmit an unlocated alert message only if no position information has been received previously for the same beacon identification. To increase the probability of Image Position Determination (as defined in C/S A.002, Appendix B.2 to Annex B), multiple unlocated alert messages may be transmitted for a beacon, provided that:

a) only one unlocated alert message is sent per GEO satellite, and

b) only one unlocated alert message is sent per LEO satellite beacon event.

3.2.9 Combined LEO/GEO Processing

For the purposes of alert data distribution procedures, solutions derived from combined LEO/GEO processing shall be treated as LEOSAR alerts.

3.3 Notification of Country of Beacon Registration (NOCR) Service

The NOCR service provides notification to the SPOC of a country when an alert is located outside of that country's SRR for a beacon registered to the country. The NOCR service ensues that a country is notified whenever one of its beacons is activated. The NOCR service is especially beneficial when a distress alert is located in an area of the world where suitable search and rescue resources are not available to perform the SAR mission. This service provides the parties responsible for the vessel, aircraft, or persons in distress an opportunity to assist the SAR services in their response to the emergency situation.

An NOCR message should not be interpreted as a request for information. If necessary, requests for information regarding the vehicle carrying a particular beacon should be made to the beacon registry.

The detailed procedure for the NOCR service is described in Annex III / B, section B.7.

3.4 Exchange of Beacon Registration Information

It is essential that every country using beacons maintain a register where SAR agencies can obtain vital information at any time. The maintenance of such a register is a national responsibility and the release of information is subject to national regulations.

Each country using beacons should make appropriate arrangements to ensure 24-hour access to their national register(s) by SAR services and inform Cospas-Sarsat of their point of contact. Cospas-Sarsat Participants should also make appropriate arrangements with the associated MCC listed in Annex I / D of this DDP, to ensure fast and easy access to its national register via the associated MCC.

IMO Assembly Resolution A.887(21) concerning registration databases of satellite EPIRBs requires the EPIRB identification code to be included in the database amongst other SAR related information. It is possible that the only means to query a database would be through the beacon ID and thus it is imperative that the correct beacon ID usage be applied. The beacon ID, as described in the Cospas-Sarsat Glossary (C/S G.004), should be used whenever requests for beacon registration information are made or provided.

3.5 System Information

System information messages include: ephemeris or orbit vector messages, time and frequency calibration messages, spacecraft telemetry and commands, Ground Segment elements and spacecraft operational status, and narrative messages. Figure III / A.8 shows the network structure for System information distribution and indicates the senders and receivers of each type of System information. Orbitography beacons also provide System information. MCCs shall send orbitography and reference beacon data to the associated nodal MCC to satisfy the Cospas-Sarsat Quality Management System (QMS) continuous monitoring and objective assessment process described in section 2 of document C/S A.003. Information on orbitography beacons can be found on the Cospas-Sarsat website at www.cospas-sarsat.org.

The CMC and the USMCC distribute orbit ephemeris data for the Cospas and Sarsat spacecraft daily. They automatically receive, process, confirm by their own calculations and transmit the ephemeris data to the other MCCs and their own LUTs.

SARR frequency calibration offset data for a given LEO satellite is used by those LEOLUTs which perform combined LEO/GEO processing to adjust the SARR frequency measurements obtained from that LEO satellite. SARR frequency calibration offset information is computed at the CMCC using a reference beacon. The CMCC automatically sends SARR frequency calibration offset messages to other MCCs once per week. SARR frequency calibration offset will be computed and distributed by the CMCC for all satellites which have an operational SARR channel.

Time calibration data is used to convert the Sarsat Search and Rescue Processor (SARP) time code to universal time (UTC). Time information provided for each 406 MHz data point must be corrected for computing the beacon location. Time and frequency calibration information for the Sarsat SARP is computed at the FMCC using signals from a time calibration platform relayed through Sarsat spacecraft. The FMCC automatically sends time calibration messages to other MCCs once per week. Time calibration is not required for processing SAR incident data from Cospas spacecraft and only Sarsat time calibration is distributed.

Sarsat payload commands requested by the CMCC (for the Search and Rescue Repeater (SARR)), the FMCC (for the SARP), or the USMCC are co-ordinated, validated and then automatically forwarded by the USMCC to the NOAA Satellite Operations Control Center (SOCC) for transmission to the NOAA spacecraft. Verification of command execution is sent from the NOAA SOCC to the USMCC for transmission to the FMCC or CMCC. The Cospas payload commands are generated by the CMC.

Narrative and coordination messages are exchanged between the MCCs. Requests for retransmissions of messages will be addressed to the appropriate MCC. System information will be archived until it is updated, and retrieved and transmitted when requested.

3.6 System Status Changes

System status changes are the result of System element and System function failures, scheduled maintenance, integration or testing of new System elements, and the commissioning of new equipment or new capabilities of existing equipment. These changes will impact the operation of the Cospas-Sarsat System and should be notified to appropriate MCCs.

Space Segment Providers will initiate System status messages to all MCCs whenever Space Segment out-of-limit conditions or changes occur, and when changes in the satellite SAR equipment are scheduled. Ground Segment Operators will initiate System status messages for changes of Ground Segment status. All changes of System status will be notified by MCCs in accordance with this section and Annex III / A of this DDP.

3.6.1 Space Segment Status

Space Segment Providers will provide notice to all Ground Segment Operators on the operational status of the spacecraft payloads in accordance with document C/S T.004. Payload status will be declared with a System Status Message as described in Annex II / D. Distribution of satellite ephemeris and SARP time calibration data, which may precede declaration of Initial Operational Capability (IOC) status, shall not itself be understood as a declaration of IOC status.

A satellite that is in IOC status shall be treated as though it were operational except that Ground Segment Operators may at their option elect to not acquire data from it via their LUTs. All Ground Segment Operators must, however, process alerts generated by other MCCs from this satellite data in their MCCs. It is recommended that satellites in IOC status be given lower priority in LUT scheduling.

3.6.2 Changes of Operational Capabilities

Changes of operational capabilities resulting from new equipment or new processing which impact the operation of the Cospas-Sarsat System, should be notified by the responsible MCC in accordance with Table 3.1 and Figure III / A.8.

Changes of System status resulting from the decommissioning of System equipment should be notified by the responsible MCC to all MCCs in accordance with Figure III / A.8.

Failure or Outage	Notification Level
Space Segment	- All MCCs should be notified
MCC	- All MCCs should be notified
LUT	- All MCCs should be notified
Communication Networks	- Only affected MCCs should be notified
Orbitography beacons	- All MCCs should be notified

Table 3.1 : Notification Level for Failure or Outage

3.6.3 System Failures

System status changes resulting from either a failure or outage of a System element or a System function should be reported to the appropriate MCC in accordance with Table 3.1 and the System Information Flow Diagram of Figure III / A.8. In addition, nodal MCCs shall update System element status in the appropriate section of the Cospas-Sarsat System website in accordance with the Cospas-Sarsat Quality Management System (QMS) continuous monitoring and assessment process, as described in section 2 of document C/S A.003.

3.6.4 Scheduled Outages

System status changes for any System element or function which result from scheduled outages for maintenance, integration or testing, should be notified by the responsible MCC to all MCC(s) in accordance with Table 3.1 and Figure III / A.8. The responsible MCC should provide advance notification as early as possible before interrupting operations, including a description of the planned back-up arrangements (see section 3.7 and Annex II / B). Additionally, the responsible MCC should repeat the notification 24 hours prior to the scheduled activity.

3.6.5 Scheduled Satellite Manoeuvres

Some LEOSAR satellites are subject to scheduled manoeuvres periodically, in order to maintain their sun synchronous orbit and thus to increase their useful life. The "Comments" section in Table II / D.2 indicates which satellites are subject to scheduled manoeuvres and whether SAR instruments remain active during the manoeuvre.

A satellite may be manoeuvred in two ways, in-plane or out-of-plane. An in-plane manoeuvre is issued to counteract the effect of drag on the semi-major axis. An in-plane manoeuvre changes satellite position by an amount that increases with each subsequent orbit. An out-of-plane manoeuvre is issued to counteract the effects of Luni-solar pull on inclination. An out-of-plane manoeuvre changes satellite position by an amount that does not increase with subsequent orbits.

A satellite manoeuvre may induce significant Doppler location errors, due to the possible application of incorrect orbit vectors by LEOLUTs. In order to mitigate the impact of planned satellite manoeuvres on Doppler location accuracy, MCCs shall implement the following procedures.

For each satellite that is subject to scheduled manoeuvres, one MCC shall be responsible for notification about its manoeuvres and is designated the responsible MCC. The USMCC is the responsible MCC for the manoeuvres of all satellites with Sarsat payloads.

The responsible MCC shall provide notification to all MCCs of the scheduled satellite manoeuvre. The responsible MCC shall provide notification 5 to 7 days in advance of a scheduled satellite manoeuvre, to allow Ground Segment Providers adequate preparation time. The responsible MCC shall repeat the notification 24 hours prior to the scheduled manoeuvre. The responsible MCC shall provide notification of the execution of the satellite manoeuvre as soon as possible after the manoeuvre is complete. If the maximum expected change in satellite position is more than 2 km in the 24 hours following completion of the manoeuvre, then the responsible MCC shall provide new orbit vectors for the satellite as soon as possible after the manoeuvre is complete. Orbit vectors associated with a satellite manoeuvre shall be provided in a SIT 216 message.

Notification of a satellite manoeuvre shall be provided in a System Status Message as described in Annex II / D, Figure N° D.2 and in accordance with Figure III / A.9. The responsible MCC shall provide information on the magnitude and duration of the expected change in satellite position. The magnitude should be provided for the 24 hour period after the manoeuvre, when possible, since the impact of the change should be negligible after 24 hours.

Based on notification of a satellite manoeuvre, MCCs shall:

a) Treat orbit ephemeris data received in a SIT 216 message within 24 hours after the end of the manoeuvre as valid, if they are within the maximum tolerance specified for the satellite in the associated System Status Message;

b) Use the validated SIT 216 orbit ephemeris data to immediately initialise orbit vectors at the MCC and its associated LUTs; and

c) Notify its RCCs and SPOCs, if the maximum expected error in Doppler location exceeds 10 kilometres within 24 hours of the manoeuvre.

MCC responsibilities for scheduled satellite manoeuvres are outlined in Figure 3.2.

3.6.6 Reactivation of the SARP Instrument

On occasion, the SARP instrument on a satellite with a Sarsat payload is deactivated, due to an unexpected or a scheduled outage. Since accurate SARP time calibration (TCAL) data is required to compute accurate Doppler locations from SARP data, it is necessary that LEOLUTs be updated with new SARP TCAL data after the SARP instrument is reactivated, prior to computing Doppler solutions from SARP data. In order to mitigate the impact of SARP reactivation on Doppler location accuracy, MCCs shall implement the following procedures.

As the MCC responsible for the SARP instrument on satellites with a Sarsat payload, the FMCC provides notification about the reactivation of the SARP instrument. The FMCC shall provide notification that new SARP TCAL data will be distributed, as far in advance as possible, in order to allow adequate preparation time for each Ground Segment Provider. The notification shall be provided in a System Status message, and should include the time it is expected that new SARP TCAL data will be sent to other MCCs, as available.

The FMCC shall provide new SARP TCAL data (in a SIT 415 or 417 message) as soon as reliable SARP TCAL data is available.

When notification about new SARP TCAL data is received by the MCC, each Ground Segment Provider shall:

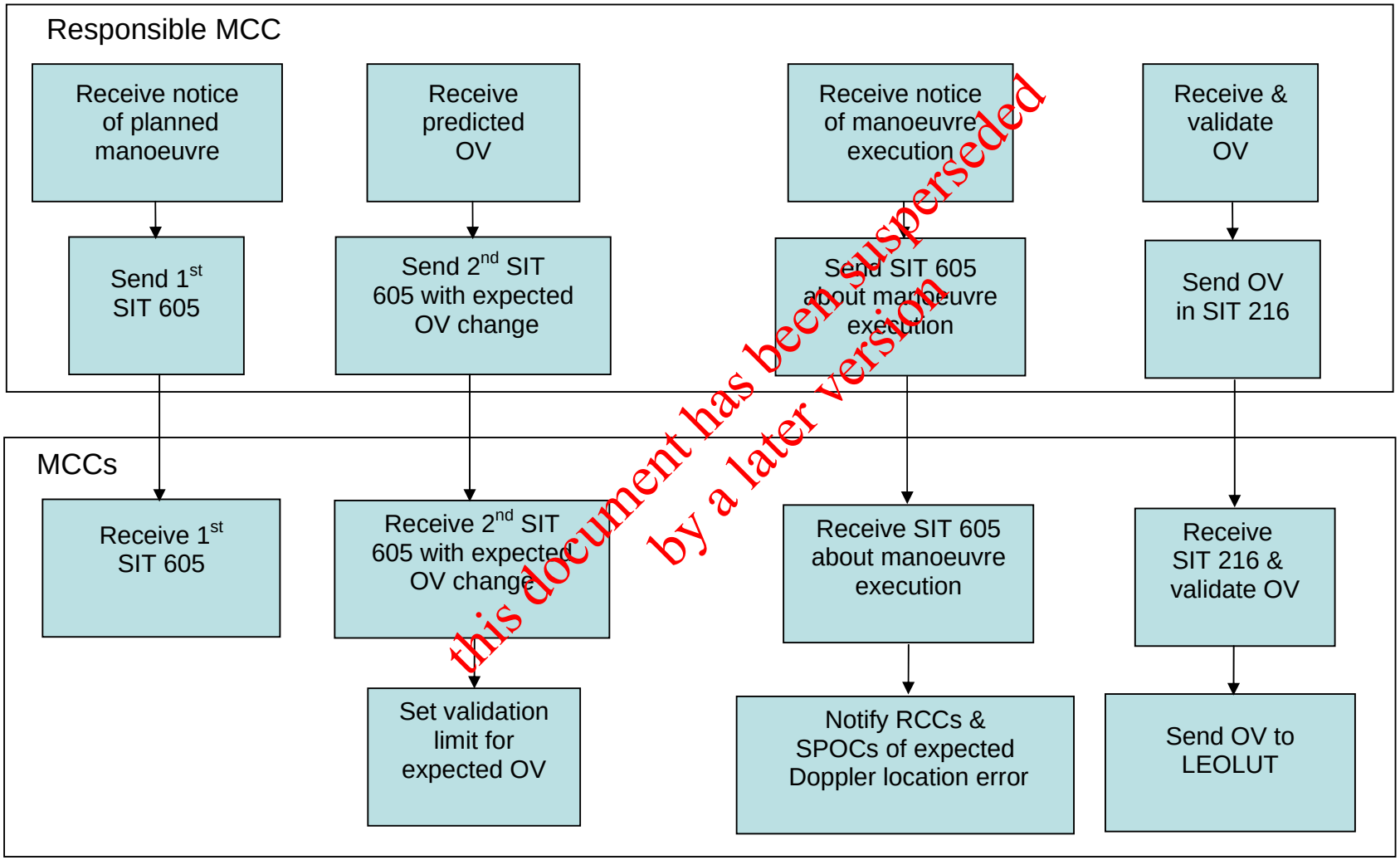
a) Ensure that the calibration time (ref. document C/S A.002, message field 37) in the new SARP TCAL data is treated as valid in its MCC, without regard to previous SARP TCAL data. The USO frequency (C/S A.002, message field 38) shall be validated per normal procedures.

b) Ensure that the new SARP TCAL data (validated as noted above) is used to initialise the SARP TCAL data in its LEOLUTs, without regard to previous SARP TCAL data.

c) Ensure that all Doppler solutions generated by its LEOLUT(s) that contain SARP data for the associated satellite are filtered, until new SARP TCAL data is loaded into the associated LEOLUT.

Once new SARP TCAL data is processed by MCCs and LUTs, each Ground Segment Provider shall resume normal validation of SARP TCAL data for the satellite, unless contrary notification is received from the FMCC.

Figure 3.2: MCC Processing for Scheduled Satellite Manoeuvres



3.7 Contingency Procedures

In general, each LUT and MCC tests itself and notifies the operator of an improper condition. Should a failure occur, the responsible MCC will notify other MCCs as described in section 3.6 by the best means available. Alternative MCCs and communication links could be designated for routing message traffic and assuming some of the functions of the failed MCC, in accordance with predetermined back-up procedures described in Annex II / B or following direct coordination with other relevant MCCs.

The MCC serving as the back-up facility may support the RCCs/SPOCs of the failed MCC directly, or by routing message traffic to a SAR authority nominated by the failed MCC. Failed MCCs should recognize the additional workload placed on the back-up MCC and provide all possible support when operating in the contingency scenario.

Back-up procedures for the distribution of System information and alert data should be described for each MCC in the relevant section of Annex II / B. Any MCC may also communicate directly with any other MCC and an MCC will respond to direct requests for information.

During back-up conditions MCCs may redirect message traffic to the back-up MCC without effecting any change to the SIT destination, MF#5. Each MCC is to specify their redirection capability in their back-up procedures. MCCs shall not transmit QMS data to the back-up nodal MCC.

Annually, each MCC should arrange to test its back-up procedures. This test should include the exercise of each specific action listed in the back-up procedures and agreements section described in Annex II / B to this DDP. Each MCC should review the results of the testing, and document problems for corrective action. To ensure that the back-up testing does not impact operational activity within a DDR, each nodal MCC should co-ordinate back-up testing within their DDR. Each MCC should also report the back-up test results to the Cospas-Sarsat Secretariat as part of their annual report on System Status and Operations (C/S A.003). In addition, each MCC should perform a quarterly test of all back-up communication methods. Each MCC should review the results of the tests and document problems for corrective action.

The annual back-up test will not be required if the back-up procedure has been operationally exercised during the year prior to the planned annual test, taking care to ensure that no more than one year passes between the tests. The back-up test will take place for at least the minimum time required to ensure the Cospas-Sarsat Quality Management System objectives of providing timely and accurate alert data are met. A specific mention of this operational back-up shall be noted in the annual status report.

The quarterly communication test shall also be considered to be accomplished when the back-up procedure has been exercised during the quarter for a time period which meets the needs of the specific MCC operator.

3.8 Exchange of Test and Exercise Data

3.8.1 Coordination of Beacon Tests

Beacons coded with operational protocols shall not be used for tests, except on rare occasions when required by and under control of a national administration, or for international exercises co-ordinated by the Cospas-Sarsat Joint Committee. All MCCs shall be notified of tests using beacons coded with operational protocols, in accordance with the procedure of Annex III / C of the DDP. Tests using beacons coded with the Test User Protocol, may be performed by anyone having co-ordinated the test with, and received approval from the responsible MCC. Coordination with affected MCCs should be performed by the responsible MCC in accordance with the procedure of Annex III / C of the DDP.

3.8.2 Exchange of Test Messages

Test data obtained for beacons coded with operational protocols or test protocols shall be exchanged between MCCs only upon request. Such requests shall contain the 15 hexadecimal characters of the Beacon Identification (bits 26 to 85 of the beacon message include, as appropriate, the default values of position data in location protocols).

3.9 Archived Information

Each LUT and MCC will archive alert data and other messages transmitted. This information will be provided upon request to another MCC, SPOC or RCC, for a specific period of time and for activities in their area of responsibility. It may be also provided to the Cospas-Sarsat Secretariat for the analysis of particular beacon events when such analysis has been requested in accordance with the procedure approved by the Cospas-Sarsat Council.

3.10 Communication Networks

Each MCC transfers alert data to other MCCs and SPOCs within its service area as described in Annex II / B.

- END OF SECTION 3 -

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ANNEXES TO THE COSPAS-SARSAT DATA DISTRIBUTION PLAN

PART I: **REFERENCE INFORMATION**

PART II: **COSPAS-SARSAT SPACE AND GROUND SEGMENT DESCRIPTION**

PART III: **OPERATIONAL PROCEDURES FOR COSPAS-SARSAT MCCs**

C/S A.001 ANNEXES

PART I:

REFERENCE INFORMATION

ANNEX I / A

LIST OF ACRONYMS USED IN C/S A.001

ACC	area control centre
AFTN	Aeronautical Fixed Telecommunications Network
BIH	Bureau International de l'Heure
Cospas	Cosmicheskaya Sistyema Poiska Avariynich Sudov (space system for the search of vessels in distress)
CSC	Cospas-Sarsat Council
DDP	Cospas-Sarsat Data Distribution Plan (C/S A.001)
DDR	data distribution region
FIC	flight information centre
FOC	full operational capability
GEOLUT	local user terminal in the Cospas-Sarsat GEOSAR system
GEOSAR	Geostationary satellite system for SAR
GMDSS	Global Maritime Distress and Safety System
G-SARP	ground SARP
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
IOC	initial operational capability
ITU	International Telecommunication Union
JC	Cospas-Sarsat Joint Committee
km	kilometre
LEOLUT	local user terminal in the Cospas-Sarsat LEOSAR system
LEOSAR	Low Earth Orbit satellite system for SAR
LUT	local user terminal
MCC	mission control centre
AEMCC	United Arab Emirates MCC
ALMCC	Algerian MCC
ARMCC	Argentine MCC
ASMCC	South African MCC
AUMCC	Australian MCC
BRMCC	Brazilian MCC
CHMCC	Chilean MCC
CMC	Cospas Mission Centre
CMCC	Canadian MCC
CNMCC	Chinese MCC
FMCC	French MCC
GRMCC	Greek MCC

HKMCC	Hong Kong MCC
IDMCC	Indonesia MCC
INMCC	Indian MCC
ITMCC	Italian MCC
JAMCC	Japan MCC
KOMCC	Korea MCC
NIMCC	Nigeria MCC
NMCC	Norwegian MCC
PAMCC	Pakistan MCC
PEMCC	Peruvian MCC
SAMCC	Saudi Arabian MCC
SIMCC	Singapore MCC
SPMCC	Spanish MCC
TAMCC	ITDC / Taipei MCC
THMCC	Thailand MCC
TRMCC	Turkey MCC
UKMCC	United Kingdom MCC
USMCC	United States MCC
VNMCC	Vietnam MCC

MID	maritime identification digits
MHz	megahertz
MRCC	maritime RCC
NOCR	notification of country of beacon registration
RCC	rescue co-ordination centre
RSC	rescue subcentre
SAIS	secondary air information station
SAR	search and rescue
SARP	SAR processor
SARR	SAR repeater
Sarsat	Search and Rescue Satellite-Aided Tracking
SID	Cospas-Sarsat Mission Control Centres Standard Interface Description (C/S A.002)
SIT	subject indicator type
SOLAS	Safety of Life at Sea (Convention)
SPOC	SAR point of contact
SRR	search and rescue region
SSAS	ship security alert system
TCA	time of closest approach
UTC	coordinated universal time

- END OF ANNEX I / A -

ANNEX I / B

OTHER INTERNATIONAL REFERENCE MATERIAL

This section includes references to other international agreements which impact on Cospas-Sarsat operations. When new or updated information is received, MCCs shall be notified in accordance with section 1.4.

I / B.1 INTERNATIONAL MARITIME ORGANIZATION

- IMO Assembly Resolution A.662(16): Performance Standards for Float-Free Release and Activation Arrangements for Emergency Radio Equipment.
- IMO Assembly Resolution A.694(17): General Requirements for Shipborne Radio Equipment Forming Part of the Global Maritime Distress and Safety System (GMDSS) and for Electronic Navigational Aids.
- IMO Assembly Resolution A.696(17): Type Approval of Satellite Emergency Position-Indicating Radio Beacons (EPIRBs) Operating in the Cospas-Sarsat System.
- IMO Assembly Resolution A.810(19): Performance Standards for Float-Free Satellite Emergency Position-Indicating Radio Beacons (EPIRBs) Operating on 406 MHz, as amended by Resolutions MSC.56(66) and MSC.120(74).
- IMO Assembly Resolution A.814(19): Guidelines for the Avoidance of False Distress Alerts.
- IMO Assembly Resolution A.887(21): Establishment, Updating and Retrieval of the Information Contained in the Registration Databases of the Global Maritime Distress and Safety System (GMDSS).
- MSC/Circ. 861: Measures to Reduce the Number of False Distress Alerts.
- MSC/Circ. 863: Recommendation on Prevention of Harmful Interference to 406 MHz EPIRBs Operating with Cospas-Sarsat System.
- MSC/Circ.1039: Guidelines for Shore-Based Maintenance of Satellite EPIRBs.
- MSC/Circ.1040: Guidelines on Annual Testing of 406 MHz Satellite EPIRBs.
- COMSAR/Circ.29: Guidelines for the voluntary use of standardized questionnaire and formats for reporting false alerts in collecting data on false alerts.
- International Convention for the Safety of Life at Sea, 1974, as amended.

- Resolution MSC.147(77): Adoption of the Revised Performance Standards for a Ship Security Alert System.

I / B.2 INTERNATIONAL CIVIL AVIATION ORGANIZATION

- Annexes to the Convention on International Civil Aviation:
  - Annex 6: Operation of Aircraft.
  - Annex 10: Aeronautical Telecommunications.
  - Annex 12: Search and Rescue.

- International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual.

- Regional Air Navigation Plans.

I / B.3 INTERNATIONAL TELECOMMUNICATION UNION

- Recommendation ITU-R M.633-3: Transmission Characteristics of a Satellite Emergency Position-Indicating Radio Beacon (Satellite EPIRB) System Operating through a Satellite System in the 406 MHz Band.

- END OF ANNEX I / B -

C/S A.001 ANNEXES

PART II:

COSPAS-SARSAT SPACE AND GROUND SEGMENT DESCRIPTION

ANNEX II / A

STATUS OF GROUND SEGMENT - LEOLUTs AND GEOLUTs

This annex provides the current status of Cospas-Sarsat LEOLUTs and GEOLUTs.

Table II / A.1 contains details and status of LEOLUTs.

Table II / A.2 contains details and status of GEOLUTs.

Table II / A.1 : Details and Status of LEOLUTs

as at: 27 October 2011

Ground Segment Operator	LEOLUT Name	Code	Associated MCC	Location		LEOLUT Commis. Report	G-SARP Commis. Report	LEO/GEO Commis. Report	Status	Comments
				Latitude	Longitude					
Algeria	Ouargla	6051	ALMCC	31° 52.80' N	005° 29.40' E	JC-10	JC-10		FOC	
	Algiers	6052		36° 45.20' N	003° 22.86' E	JC-19	JC-19		N	
Argentina	Rio Grande	7012	ARMCC	53° 46.75' S	067° 42.32' W	JC-23	JC-23	JC-23	FOC	
	El Palomar	7014		34° 36.00' S	058° 36.00' W	JC-23	JC-23	JC-23	FOC	
Australia	Bundaberg	5032	AUMCC	24° 45.50' S	152° 24.77' E	JC-18	JC-18		FOC	
	Albany	5033		35° 07.20' S	117° 53.94' E	JC-19	JC-19		FOC	
Brazil	Brasilia	7101	BRMCC	15° 51.43' S	047° 54.16' W	JC-18	JC-18	JC-19	FOC	
	Recife	7102		08° 08.30' S	034° 55.50' W	JC-18	JC-18	JC-20	FOC	
	Manaus	7103		03° 01.39' S	060° 03.24' W	JC-21	JC-21		FOC	
Canada	Goose Bay	3161	CMCC	53° 18.76' N	060° 27.96' W	JC-18	JC-18	JC-23	FOC	
	Churchill	3162		58° 45.54' N	093° 59.64' W	JC-18	JC-18	JC-23	FOC	
	Edmonton	3163		53° 40.69' N	113° 18.97' W	JC-18	JC-18	JC-23	FOC	
	Ottawa	3168		45° 19.72' N	075° 40.47' W	JC-19	JC-19	JC-23	FOC	Test / back-up facility
Chile	Santiago	7251	CHMCC	33° 29.34' S	070° 42.00' W	JC-22	JC-22		FOC	
	Punta Arenas	7252		53° 00.36' S	070° 50.82' W	JC-22	JC-22		FOC	
	Easter Island	7254		27° 09.01' S	109° 26.23' W	JC-15	JC-15		FOC	
China (P.R.of)	Beijing (1)	4121	CNMCC	39° 54.48' N	116° 25.20' E	JC-24	JC-24		FOC	
	Beijing (2)	4122		39° 54.48' N	116° 25.20' E	JC-24	JC-24		FOC	
France	Toulouse (1)	2271	FMCC	43° 33.64' N	001° 28.85' E	JC-18	JC-18		FOC	
	Toulouse (2)	2272		43° 33.65' N	001° 28.85' E	JC-18	JC-18		FOC	
Greece	Penteli	2401	GRMCC	38° 04.85' N	023° 52.98' E	JC-21	JC-21	JC-22	FOC	
Hong Kong, China	Hong Kong (1)	4771	HKMCC	22° 16.55' N	114° 08.67' E	JC-22	JC-22		FOC	
	Hong Kong (2)	4772		22° 16.55' N	114° 08.67' E	JC-22	JC-22		FOC	
India	Bangalore	4191	INMCC	13° 02.09' N	077° 30.70' E	JC-17	JC-17		FOC	
	Lucknow	4192		26° 54.80' N	080° 57.44' E	JC-20	JC-20		FOC	
Indonesia	Jakarta	5251	IDMCC	06° 07.57' S	106° 39.36' E	JC-23	JC-23		FOC	
	Makassar	5252		05° 04.00' S	119° 33.00' E	TBD	TBD		UD	
Italy	Bari	2471	ITMCC	41° 08.26' N	016° 50.86' E	JC-14	JC-14		FOC	
ITDC	Keelung (1)	4161	TAMCC	25° 08.12' N	121° 45.44' E	JC-24	JC-24		FOC	
	Keelung (2)	4162		25° 08.12' N	121° 45.44' E	JC-23	JC-23	JC-23	FOC	
Japan	Gunma	4313	JAMCC	36° 25.56' N	138° 57.30' E	JC-21	JC-21		FOC	
Korea	Incheon	4403	KOMCC	37° 23.58' N	126° 38.94' E	JC-20	JC-20		FOC	
New Zealand	Wellington	5121	AUMCC	41° 09.12' S	175° 30.27' E	JC-19	JC-19		FOC	
Nigeria	Abuja	6571	NIMCC	09° 04.56' N	007° 29.58' E	JC-18	JC-18		FOC	

Ground Segment Operator	LEOLUT Name	Code	Associated MCC	Location		LEOLUT Commis. Report	G-SARP Commis . Report	LEO/GEO Commis. Report	Status	Comments
				Latitude	Longitude					
Norway	Tromsoe	2571	NMCC	69° 39.74' N	018° 56.42' E	JC-7	JC-10		FOC	
	Spitsbergen	2573		78° 13.74' N	015° 23.76' E	JC-17	JC-17		FOC	
Pakistan	Karachi	4631	PAMCC	24° 56.76' N	067° 08.16' E	JC-24	JC-24		FOC	
Peru	Callao	7601	PEMCC	12° 01.84' S	077° 07.79' W	JC-20	JC-20		FOC	
Russia	Moscow	2731	CMC	55° 44.60' N	037° 43.36' E	TBD	TBD		UD	2012
	Nakhodka	2733		42° 51.52' N	132° 47.44' E	JC-20	JC-20		FOC	
Saudi Arabia	Jeddah (1)	4031	SAMCC	21° 39.29' N	039° 08.56' E	JC-21	JC-21		FOC	
	Jeddah (2)	4032		21° 39.29' N	039° 08.56' E	JC-21	JC-21		FOC	
Singapore	Singapore	5631	SIMCC	01° 21.12' N	103° 59.28' E	JC-19	JC-19		FOC	
South Africa	Cape Town	6011	ASMCC	33° 52.80' S	018° 30.00' E	JC-13	JC-13		FOC	
Spain	Maspalomas	2241	SPMCC	27° 45.84' N	015° 38.04' W	JC-7	JC-10		FOC	
Thailand	Bangkok (1)	5671	THMCC	13° 43.03' N	100° 32.60' E	JC-23	JC-23	JC-23	FOC	
	Bangkok (2)	5672		13° 43.03' N	100° 32.59' E	JC-23	JC-23	JC-23	FOC	
Turkey	Ankara (1)	2711	TRMCC	40° 08.45' N	032° 59.38' E	JC-19	JC-19	JC-20	FOC	
	Ankara (2)	2712		40° 08.44' N	032° 59.38' E	JC-19	JC-19	JC-20	FOC	
UAE	Abu Dhabi	4701	AEMCC	24° 25.89' N	054° 26.87' E	JC-22	JC-22	JC-22	FOC	
UK	Combe Martin	2321	UKMCC	51° 10.20' N	004° 03.06' W	JC-18	JC-18	JC-20	FOC	
USA	Alaska 1 (AK1)	3031	USMCC	64° 58.42' N	147° 31.04' W	JC-18	JC-18		FOC	
	Alaska 2 (AK2)	3032		64° 58.41' N	147° 31.03' W	JC-18	JC-18		FOC	
	Hawaii 1 (HI1)	3381		21° 31.24' N	157° 59.78' W	JC-18	JC-18		FOC	
	Hawaii 2 (HI2)	3382		21° 31.24' N	157° 59.78' W	JC-18	JC-18		FOC	
	Guam 1 (GU1)	3383		13° 34.70' N	144° 56.34' E	JC-18	JC-18		FOC	
	Guam 2 (GU2)	3384		13° 34.70' N	144° 56.35' E	JC-18	JC-18		FOC	
	Florida 1 (FL1)	3663		25° 36.96' N	080° 23.03' W	JC-18	JC-18		FOC	
	Florida 2 (FL2)	3664		25° 36.98' N	080° 23.03' W	JC-18	JC-18		FOC	
	California 1 (CA1)	3667		34° 39.75' N	120° 33.09' W	JC-19	JC-19		FOC	
	California 2 (CA2)	3668		34° 39.74' N	120° 33.10' W	JC-19	JC-19		FOC	
	LSE	3673		38° 51.02' N	076° 55.80' W	JC-18	JC-18		FOC	Test / back-up facility
Vietnam	Haiphong	5741	VNMCC	20° 48.07' N	106° 42.60' E	JC-18	JC-18		FOC	

Notes:
- N Not operational.
- TBD To be determined.
- UD Under development (could change their status to operational before the next revision of this document).
- FOC Full Operational Capability.
- IOC Initial Operational Capability.
- LSE LEOSAR Support Equipment.

Table II / A.2 : Details and Status of GEOLUTs

as at: 27 October 2011

Ground Segment Operator	GEOLUT Name	Code	Associated MCC	Location		Operational Satellite	GEOLUT Commisssioning Report	Status	Comments
				Latitude	Longitude				
Algeria	Algiers	6053	ALMCC	36° 45.20'N	003° 22.86' E	MSG-2	JC-19	FOC	
Argentina	El Palomar	7011	ARMCC	34° 36.00' S	058° 36.00' W	GOES-13	JC-16	FOC	
Brazil	Brasilia	7104	BRMCC	15° 51.43' S	047° 54.16' W	GOES-13	JC-16	FOC	
	Recife	7105		08° 08.30' S	034° 55.50' W	GOES-13	JC-17	FOC	
Canada	Edmonton	3166	CMCC	53° 40.69' N	113° 18.97' W	GOES-11	JC-18	FOC	
	Ottawa (1)	3167		45° 19.74' N	075° 40.44' W	GOES-13 / GOES-11	JC-21	FOC	Test / back-up facility
	Ottawa (2)	3169		45° 20.63' N	075° 40.46' W	GOES-13	JC-21	FOC	
Chile	Santiago	7253	CHMCC	33° 29.34' S	070° 42.00' W	GOES-13	JC-22	FOC	
France	Toulouse	2273	FMCC	43° 33.52' N	001° 28.85' E	MSG-2	JC-18	FOC	
Greece	Penteli	2402	GRMCC	38° 04.85' N	023° 52.98' E	MSG-2	JC-21	FOC	
India	Bangalore	4193	INMCC	13° 02.09' N	077° 30.70' E	INSAT-3A	CSC-43	FOC	
Italy	Bari	2472	ITMCC	41° 08.22' N	016° 50.82' E	MSG-2	JC-21	FOC	
New Zealand	Wellington (1)	5122	AUMCC	41° 09.12' S	175° 30.27' E	GOES-11	JC-20	FOC	
	Wellington (2)	5123		41° 09.12' S	175° 30.27' E	GOES-11	JC-18	FOC	
Norway	Fauske	2572	NMCC	67° 14.22' N	015° 18.12' E	MSG-1	JC-19	FOC	
Russia	Moscow	2735	CMC	55° 44.60' N	037° 43.36' E	Electro-L	TBD	UD	2011
	TBD	2736		TBD	TBD	TBD	TBD	UD	2013
Spain	Maspalomas (1)	2242	SPMCC	27° 45.84' N	015° 38.04' W	GOES-13	JC-16	FOC	
	Maspalomas (2)	2243		27° 45.84' N	015° 38.04' W	MSG-2	JC-19	FOC	
Turkey	Ankara	2713	TRMCC	40° 08.42' N	032° 59.40' E	MSG-1	JC-19	FOC	
UAE	Abu Dhabi	4702	AEMCC	24° 25.89' N	054° 26.87' E	MSG-2	JC-22	FOC	
UK	Combe Martin	2322	UKMCC	51° 10.00' N	004° 02.83' W	MSG-2	JC-19	FOC	GOES-13 is used as operational satellite when needed (commissioning report agreed at JC-14)
USA	Maryland (1)	3674	USMCC	38° 51.02' N	076° 55.80' W	GOES-13	JC-19	FOC	
	GSE	3675		38° 51.02' N	076° 55.80' W	GOES-11 / GOES-13	JC-19	FOC	Test / back-up facility
	Maryland (2)	3676		38° 51.02' N	076° 55.80' W	GOES-11	JC-19	FOC	

Notes:
FOC Full Operational Capability.
GSE GEOSAR Support Equipment.
TBD To be determined.
UD Under development.

- END OF ANNEX II / A -

ANNEX II / B

DESCRIPTION OF COSPAS-SARSAT MCCs

II / B.1 GENERAL

The purpose of this Annex is to describe the Cospas-Sarsat MCCs and their interfaces, types of messages originated, normal routing of these messages, and any back-up arrangements with other MCCs and a list of supported SPOCs. Any general information, such as 406 MHz beacon register queries, may be included in this section.

Any changes which are unique to the MCC may be amended by that MCC. If bilateral changes are involved, both MCCs shall draft appropriate amendments to their sections once the new interface has been successfully tested. These changes will be released in accordance with section 1.4.

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II / B.AE AEMCC - UNITED ARAB EMIRATES MISSION CONTROL CENTRE

1. GENERAL

The UAE Mission Control Centre is manned and operates 24/7. AEMCC operates two Operational Control Consoles. The primary (AEMCC) is located in Abu Dhabi, the secondary (AEMCC2) is a back-up to the primary and it is co-located with Abu Dhabi SAR Coordination Centre in Abu Dhabi.

AEMCC controls one LEOLUT and one GEOLUT located in Albateen Airbase (Abu Dhabi, UAE) at the following locations:

	Latitude	Longitude
LEOLUT	24° 25.89' N	054° 26.87' E
GEOLUT	24° 25.89' N	054° 26.87' E

2. SPOCs SUPPORTED

United Arab Emirates (to be updated after FOC)

3. SYSTEM INFORMATION MESSAGES

The following System information messages are received/originated at AEMCC:

Orbit vectors:	receive from SPMCC;
SARP calibration:	receive from SPMCC;
System status:	originate to and receive from SPMCC;
Narrative:	received and originated as required.

4. BACK-UP PROCEDURES AND AGREEMENTS

In the case of complete failure of the AEMCC, the SPMCC will assume the duties of the AEMCC. SPMCC will send validated Cospas-Sarsat alert data within the AEMCC service area to Abu Dhabi SAR Coordination Center for further distribution to AEMCC designated SPOCs or RCCs.

5. OTHER INFORMATION

Beacon Registration

Beacon registration is maintained by AEMCC.

- END OF THIS SECTION -

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II / B.AL ALMCC - ALGERIAN MISSION CONTROL CENTRE

1. GENERAL

The Algerian Mission Control Centre is located at Algiers. The ALMCC controls two LEOLUTs at Ouargla and Algiers (see location at Annex II / A, Table II / A.1) and one GEOLUT at Algiers (see Table II / A.2 of Annex II / A).

The Ouargla and Algiers LEOLUTs coverage overlaps with French, Italian, Spanish and UK LEOLUTs on Western Africa and Europe and extends southward to the Guinea Gulf up to Gabon and Congo and eastward up to the Red Sea.

The two LEOLUTs can localise transmitters and distress beacons in local mode and global mode. Interferers in the 406.0 to 406.1 MHz band are localised in the local mode and this information is provided to the Algerian Telecommunication for action through the ITU.

The GEOLUT is co-located with the LEOLUT at Algiers and it operates with MSG-2 satellite.

The SAR Administration is the head agency in Algeria for the Cospas-Sarsat Programme.

2. SPOCs SUPPORTED

ALMCC provides alert data to SPOCs in the ALMCC service area including:

Algeria	Libya
Burkina Faso	Niger
Egypt	

It also routes alert messages to SPMCC, and can receive these messages from this source.

Alert messages in other DDR service areas are routed to the SPMCC.

A communication summary for these interfaces is shown below:

Algerian RCC:	AFTN, Telex, Fax, Voice
SPMCC:	FTP-VPN, AFTN, X.25, Fax, Voice

3. SYSTEM INFORMATION MESSAGES

The following System information messages are received/originated at ALMCC:

Orbit vectors:	received from SPMCC;
SARP calibration:	received from SPMCC;
System status:	received and originated as required;
Narrative:	received and originated as required.

4. BACK-UP PROCEDURES AND AGREEMENTS

The Ouargla LEOLUT has overlapping local mode coverage areas to a greater or lesser extent with the following LEOLUTs: Abuja, Bari, Combe Martin, Maspalomas and Toulouse. It is therefore feasible for one to back up the other in the case of a failure or planned maintenance downtime.

LUT operators will forward written notice of intention to perform maintenance routines involving deactivation of the LUT well in advance. The MCC will inform all other MCCs as soon as a decision has been taken and will confirm the times a minimum of two weeks prior to deactivation.

In the case of a complete failure of the ALMCC, the SPMCC will assume the duties of the ALMCC. SPMCC will send validated Cospas-Sarsat alert data within the ALMCC service area to designated SPOCs or RCCs. In the Algerian SRR this will be Algiers RCC (this AFTN address is DAALZSZX).

5. OTHER INFORMATION

To be determined.

- END OF THIS SECTION -

II / B.AR ARMCC - ARGENTINE MISSION CONTROL CENTRE

1. GENERAL

The Argentine Mission Control Centre (ARMCC) is located in El Palomar, Buenos Aires. The ARMCC controls two LEOLUTs and one GEOLUT at the following locations:

	Latitude	Longitude
El Palomar GEOLUT	34 º 36.00' S	058 º 36.00' W
Rio Grande LEOLUT	53 º 46.75' S	067 º 42.32' W
El Palomar LEOLUT	34 º 36.00' S	058 º 36.00' W

The Argentine LEOLUTs provide full processing of 406 MHz frequency alert data, including G-SARP processing of the transponded SARR data and combined LEO/GEO processing, according to the relevant Cospas-Sarsat specifications. The local coverage area of the Argentine LEOLUTs includes Argentina, South of Brazil and Peru, Bolivia, Paraguay, Uruguay, Chile, part of Antarctica, the Southwestern Atlantic Ocean and Southeastern Pacific Ocean.

The Argentine GEOLUT receives data from the GOES-12 satellite and provides it to the ARMCC for distribution and to the LEOLUTs for combined LEO/GEO processing.

The communication interfaces available at the ARMCC are AFTN, FTP-PNV, Telephone and Fax. These communication means are used as follows:

ARMCC-USMCC:	FTP-VPN	AFTN
ARMCC-RCCs:	AFTN	
ARMCC-Malvinas/Falkland Islands:	Telephone	Facsimile
ARMCC-CHMCC:	AFTN	

The entire ground segment is maintained and operated twenty-four hours a day, seven days a week by SASS (Servicio de Alerta y Socorro Satelital), a joint Argentine Navy/Air Force office.

2. SPOCs SUPPORTED

The ARMCC supports the RCCs in Argentina and Falkland Islands / Malvinas SRR.

3. SYSTEM INFORMATION MESSAGES

The ARMCC receives and process the following System information messages:

Orbit vectors
SARP calibration data
SARR calibration data
System status
Narrative

The ARMCC is capable of originating the following System information messages:

System status
Narrative

These messages are normally received from, or sent to the USMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The back-up procedure described herein is available for the whole Argentine Mission Control Centre (ARMCC) service area in such a way that the coverage in local mode provided by the LEOLUT stations of the Chilean Mission Control Centre (CHMCC) overlaps the LEOLUT coverage of the ARMCC.

The procedure whereby the back-up service is implemented in case of an unexpected failure or scheduled interruption of the ARMCC service may occur and is expected to last more than four (4) hours is as follows:

The CHMCC sends Cospas Sarsat alerts data to the ARMCC over AFTN.

During scheduled or unscheduled ARMCC outages, incoming AFTN data is re-routed to appropriate RCCs using the SIT 185 format as defined in the C/S A.002 document.

When this procedure is implemented, the ARMCC's duty personnel will contact the National RCCs (maritime and aerial) and advice them that CHMCC provide the Cospas Sarsat alert distress distribution.

The ARMCC will attempt to pass them to its service area RCCs/SPOCs by manually geosorting them and using the AFTN link communication, facsimile and/or other alternative links.

The back-up procedures for the ARMCC consist of the following steps:

a. Whenever back-up service is required, the ARMCC notifies CHMCC and USMCC, requesting them to provide the back-up service. The requirement is voice-transmitted to the USMCC and CHMCC by the ARMCC and optionally confirmed by means of Email or Fax.

b. The CHMCC notifies USMCC and ARMCC when the back-up service is being provided.

c. The USMCC notifies CHMCC and ARMCC when the back-up service is being provided. During the back-up service provision, the USMCC sends to CHMCC the messages for and to be forwarded to ARMCC. The USMCC will hold the messages intended for ARMCC for re-transmission upon request.

d. The USMCC notifies all MCCs of the start of the back-up service by means of a SIT 605 message (as established in C/S A.001, section 3.6).

e. The ARMCC sends a SIT 605 message when the ARMCC normal service is restored.

f. The USMCC sends a SIT 915 message to ARMCC and CHMCC notifying them that data distribution to/from ARMCC is back to normal.

g. The CHMCC sends a SIT 915 message to ARMCC and USMCC notifying them that data distribution to/from ARMCC is back to normal.

5. OTHER INFORMATION

The beacon database is maintained by the ARMCC.

- END OF THIS SECTION -

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II / B.AS ASMCC - SOUTH AFRICAN MISSION CONTROL CENTRE

1. GENERAL

The South African Mission Control Centre is located in Milnerton (Cape Town). The ASMCC controls one LEOLUT with G-SARP. This LEOLUT is located at:

Latitude	Longitude
33 ^{o} 52.80' S	018 ^{o} 30.00' E

The South African MCC and LEOLUT operate 24 hours a day throughout the year.

The Maritime division of Telkom SA is responsible for the operation of the South African MCC and LEOLUT.

2. SPOCs SUPPORTED

Angola	Lesotho	South Africa	Zimbabwe
Botswana	Malawi	St. Helena	
Burundi	Mozambique	Swaziland	
Democratic	Namibia	Uganda	
Republic of Congo	Rwanda	Zambia	

The communication interfaces used by the ASMCC are:

AFTN FTP-VPN X.25 Telex

3. SYSTEM INFORMATION MESSAGES

The ASMCC originates and receives the following System information:

Orbit vectors: receive from AUMCC;
SARP calibration: receive from AUMCC;
System status: originate and receive from AUMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

In the event the ASMCC becomes unserviceable, the AUMCC will provide back-up support to the ASMCC. All alerts for the ASMCC service area will be transmitted on SIT 185 format and faxed to a number nominated by the ASMCC. The ASMCC will ensure distribution to the RCCs it supports.

5. OTHER INFORMATION

To be determined.

- END OF THIS SECTION -

II / B.AU AUMCC - AUSTRALIAN MISSION CONTROL CENTRE

1. GENERAL

The Australian Mission Control Centre is co-located with the RCC Australia in Canberra. The AUMCC controls two advanced technology LEOLUTs (ATLUT -500) with G-SARP. These two LEOLUTs are located in lighthouses on the coast at:

	Latitude	Longitude	
Albany, Western Australia	35 ^{o} 07.20' S	117 ^{o} 53.94' E	(Cave Point Lighthouse)
Bundaberg, Queensland	24 ^{o} 45.50' S	152 ^{o} 24.77' E	(South Head Lighthouse)

These two LEOLUTs are known nationally as AULUTW (AULUT West - ID: 5033) and AULUTE (AULUT East - ID: 5032) and provide local mode coverage of the continental land mass and extending to seaward into the Indian and South Pacific Oceans and Coral and Tasman Seas.

Both LEOLUTs were registered with ITU in October 1999 (ID numbers: 96.944556 and 96.944558 - for Albany LEOLUT, 96.944552 and 96.944554 - for Bundaberg LEOLUT).

The AUMCC receives alert data from the Wellington LEOLUT (NZLUT - ID: 5121) and Wellington GEOLUTs (NZGEO1 - ID: 5122 and NZGEO2 - ID: 5123) and distributes them in accordance with document C/S A.001.

The AUMCC and LEOLUTs operate 24 hours a day throughout the year providing alert data through the co-located RCC in accordance with this document.

The AUMCC also assumes the nodal responsibilities for the Southwest Pacific DDR as defined at Annex III / A of this document.

The Australian Maritime Safety Authority (AMSA) is responsible for the management and operation of the Australian Cospas-Sarsat ground segment.

2. SPOCs SUPPORTED

American Samoa, Nauru , Samoa, Vanuatu, Australia, New Caledonia, Solomon Islands, Fiji, New Zealand, Tonga, Kiribati, Papua New Guinea, and Tuvalu.

American Samoa, Tonga, and Samoa are within the New Zealand SRR. Kiribati, Tuvalu, and Vanuatu are within the Fiji SRR. Nauru is within the Solomon Islands SRR.

The AUMCC, in supporting its service area, passes alerts to the following SRRs: Australia, New Zealand, Papua New Guinea, Solomon Islands and Fiji.

Alerts in vicinity of New Caledonia are passed to the SAR authority in Noumea.

3. SYSTEM INFORMATION MESSAGES

The AUMCC originates, receives and forwards System Information messages as follows:

Orbit vectors: receive from CMC and USMCC and forward to ASMCC, IDMCC, SIMCC and THMCC;

SARP calibration: receive from FMCC and forward to ASMCC, IDMCC, SIMCC and THMCC;

System status: originate, receive and forward from/to ASMCC, CMC, FMCC, IDMCC, JAMCC, SIMCC, SPMCC, THMCC and USMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The Australian and New Zealand LEOLUTs provide partial back-up for each other as there is some overlapping local mode coverage.

An agreement is in place with the USMCC to provide back-up of the AUMCC nodal responsibility. The following procedure has been agreed to:

In the event of a failure of the nodal AUMCC, the duty personnel will:

a. contact the USMCC and advise them to assume AUMCC nodal responsibilities;
b. request the USMCC to transmit AUMCC service area alerts in SIT 185 format. The AUMCC will attempt to pass them to its service area RCCs/SPOCs by manually geosorting them and using the RCC communication modes available; and
c. advise the USMCC that alerts from the local Australian or New Zealand LEOLUTs will be passed by the RCC in some form on a 'best effort' basis.

It should be noted that the RCC/AUMCC has a disaster recovery plan and if conditions are such that the primary site has to be abandoned then personnel will be transferred to an alternative site. This alternate site is already set up to support most of the RCC functions and some AUMCC functions.

5. OTHER INFORMATION

The AUMCC is responsible for the allocation of serial numbers for all serialized coded beacons and the maintenance of the Australian beacon database register and can be contacted at any time to obtain database information. Purchasers of beacons are required to complete a registration form (http://beacons.amsa.gov.au) giving details of craft, emergency contact numbers and beacon 15 HEX ID.

If national serial numbers, as provided by Australia's national authority, AusSAR (Email: ausbeacon@amsa.gov.au), are to be used, the Cospas-Sarsat type approval number (TAC) should **NOT** be inserted and bit 43 should be set to "0". If the TAC No is to be inserted, bit 43 should be set to "1" and the manufacturer's serial number of the beacon used.

EPIRBs and PLBs for sale in Australia should meet the requirements of the Australian Standard 4280. The 121.5 MHz homing transmitter referred to in Standard 4280 must be approved by the Australian Communications Authority or by a laboratory providing an equivalent service. Beacons being sold to the general public in Australia should have compliance folders that demonstrate the beacon meets the operational and environmental requirements of the Australian Standard.

EPIRBs carried by vessels under the Australian Navigation Act must comply with the relevant Parts of Marine Orders.

ELTs for sale in Australia are required to comply with Aviation Regulation 252.

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II / B.BR BRMCC - BRAZILIAN MISSION CONTROL CENTRE

1. GENERAL

The Brazilian Mission Control Centre (BRMCC) operates two Operational Control Consoles (OCCs). The first one as primary OCC located in Brasilia, the second one as secondary OCC being a back-up facility co-located with RCC-RE in Recife. Three LEOLUTs are located at Brasilia, Manaus and Recife; the BRMCC also operates two GEOLUTs at Brasilia and Recife with the following co-ordinates:

LEOLUTs:

	Latitude	Longitude
Brasilia	15° 51.43' S	047° 54.16' W
Manaus	03° 01.39' S	060° 03.24' W
Recife	08° 08.30' S	034° 55.50' W

GEOLUTs:

Brasilia	15° 51.43' S	047° 54.16' W
Recife	08° 08.30' S	034° 55.50' W

All Brazilian LEOLUTs can localise 406 MHz distress beacons in local and global coverage mode also Brazilian LEOLUTs can process 406 MHz interference data in local coverage mode.

The local mode coverage of the Brazilian LEOLUTs includes the central part of South America and western area of South Atlantic Ocean.

The BRMCC, GEOLUTs and LEOLUTs operate 24 hours a day throughout the year.
The communication interfaces used by BRMCC are:

AFTN FTP-VPN Voice Facsimile

2. SPOCs SUPPORTED

The BRMCC provides primary support to the Brazilian RCCs and Ascension Island and routes alert and notification (NOCR) messages to other countries and can receive these messages from them.

3. SYSTEM INFORMATION MESSAGES

The BRMCC originates and receives the following System information:

Orbit vectors: receive from USMCC;
SARP calibration: receive from USMCC;

System status:	originate to and receive from USMCC;
406 MHz SARR frequency calibration:	receive from USMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

Brasilia, Manaus and Recife LUTs have overlapping local mode coverage areas to a greater or lesser extent with the following LEOLUTs: Parana, Callao, Florida and Santiago. It is therefore feasible for the Brazilian area to be partly covered in the case of failure or planned maintenance downtime.

The BRMCC operates two Operational Control Consoles (OCCs). The first one as primary OCC located in Brasilia, the second one as secondary OCC being a back-up facility co-located with RCC-RE in Recife.

In the event of failure of primary OCC, Brazil has back-up agreements and procedures in place with the USA. The following procedures have been agreed to:

a) the BRMCC (from Brasilia) notifies the USMCC whenever the back-up service is required by means of Fax, Phone or Email;

b) the USMCC notifies the BRMCC (Brasilia) when the back-up service commences by fax, phone or email. In case of failure of these contacts, USMCC shall notify the BRMCC (Recife), as contact list bellow;

c) the USMCC sends a SIT 605 message notifying the other MCCs of the BRMCC failure, and that the USMCC is performing back-up service according to section 3.7, document C/S A.001;

d) the USMCC transmits alert messages or status messages, as appropriate, for the Brazilian service area to RCC-RE using the BRMCC OCC-2 AFTN address **SBRFZSZX** (primary communication link) or via FTP-VPN link;

e) in the event that the USMCC is unable to communicate with the BRMCC (OCC-2 Recife) as described in “d” above, the USMCC shall transmit alerts for the Brazilian service area in SIT 185 format to the Brasilia RCC (RCC-BS) AFTN address (primary communication link) or via Fax. In this case, the USMCC will advise the RCC-BS of their inability to communicate with the BRMCC (OCC-2 Recife). Other Brazilian RCCs as well as BRMCC (Brasilia) will be advised by RCC-BS;

f) the BRMCC (from Recife) advises the Brazilian RCCs about the BRMCC failure and about the back-up procedures;

g) the BRMCC (from Brasilia or Recife) will notify the USMCC as soon as the problem is solved, and will advise the time when the BRMCC (Brasilia) plans to restore normal operations;

h) when the BRMCC (Brasilia) returns to normal operations it will send a SIT 605 message notifying the USMCC and other MCCs that the BRMCC (Brasilia) has resumed normal operations;

i) the USMCC will send all requested missing messages to the BRMCC (Brasilia).

CONTACT LIST	
BRMCC in Brasilia	Phone: (55) 61 3364 8395 / (55)61 33652964 Fax: (55) 61 3365 2964 / (55) 61 3365 1212 Email: brmcc@cindactal.aer.mil.br
BRMCC in Recife	Phone/Fax: (55) 81 21298102 or (55) 81 34624927 AFTN RCC-RF: SBREYCYX Email: salvaero.re@gmail.com
RCC Brasilia	Phone: (55) 61 3364 8394 Fax: (55) 61 3365 2964 / (55) 61 3365 1212 AFTN RCC-BS: SBBSYCYX Email: rccbs@cindacta1.aer.mil.br

5. OTHER INFORMATION

To be determined.

- END OF SECTION -

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II / B.CA CMCC - CANADIAN MISSION CONTROL CENTRE

1. GENERAL

The Canadian Mission Control Centre is located in Trenton, Ontario and controls four LEOLUTs:

Churchill, Manitoba
Edmonton, Alberta
Goose Bay, Labrador
Ottawa, Ontario (test / back-up facility)

And three GEOLUTs at the following locations:

Edmonton, Alberta
Ottawa (1), Ontario (test / back-up facility)
Ottawa (2), Ontario

Locations are provided at Annex II / A.

The LEOLUTs provide full coverage of Canadian SRRs from mid-Atlantic to the Gulf of Alaska and from the North Pole south to approximately 30 degrees north latitude. Operations are 24 hours per day, 7 days per week.

The communication interfaces used by the CMCC are:

Canadian RCCs:	FTPS (File Transfer Protocol Secure), PSTN (Public Switched Telephone Network), Voice, Fax
LUTs to CMCC:	FTPS, PSTN
USMCC:	FTP-VPN, AFTN, Voice, Fax
UKMCC:	AFTN, FTP-VPN, Voice, Fax
Other MCCs as required:	FTP-VPN, AFTN, Voice, Fax

2. SPOC'S SUPPORTED

The CMCC has no SPOCs in its SRR. However, the CMCC provides primary support to three Canadian Joint Rescue Coordination Centres (JRCCs Victoria, Trenton and Halifax) and two Canadian Maritime Rescue Sub-Centres (MRSCs Quebec City and St John's), and through JRCC Halifax, to Saint Pierre and Miquelon (French Islands off the south coast of Newfoundland). It also routes alerts and NOCR messages to the USMCC, and the UKMCC, and can receive these messages from these sources.

Alert and NOCR messages for other service areas are routed through the USMCC.
The CMCC also co-operates with the UKMCC to help resolve ambiguity on 406 MHz signals in the North Atlantic.

3. SYSTEM INFORMATION MESSAGES

Canada originates and receives the following System information messages:

SARR command:	originate to USMCC;
SARR command verification:	receive from USMCC;
System Status:	originate and receive, as required;
Narrative:	originate and receive, as required;
Orbit Vectors:	receive via USMCC;
SARP calibration:	receive via USMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The LUTs operated by the CMCC and USMCC provide overlapping coverage of each other's areas of responsibility.

In the event of a complete CMCC failure, Canada has a back-up agreement and procedure in place with the USMCC. The USMCC would route alert data directly to appropriate Canadian RCC or MRSC.

In the event of a USMCC failure, the USMCC has a back-up agreement and procedure in place with CMCC and AUMCC. CMCC would assume USMCC national Sarsat responsibility and send alerts directly to the appropriate US RCCs. For alerts outside the USMCC SRR, CMCC will send alerts via FTP/VPN or AFTN to AUMCC, as AUMCC assumes nodal responsibilities for USMCC. The USMCC provides CMCC with the current Geosort data for its national RCCs and SPOCs.

In the event of problems with the two communications links established with the UKMCC, data will be forwarded via the USMCC.

Canada has installed a completely functional back-up system for CMCC at Belleville. Ontario. In the unlikely event of the need to transition to this alternate location, CMCC would inform the USMCC as soon as possible. Once all communication links have been reconfigured, operation of the back-up site would be transparent to external MCCs/agencies.

CMCC retains all data received on-line for approximately 35 days, after which it is archived.

5. OTHER INFORMATION

Registration of Beacons

A register for Canadian beacons is maintained by the Canadian Beacon Registry, located at CMCC in Trenton, Canada.

- END OF THIS SECTION -

II / B.CH CHMCC - CHILEAN MISSION CONTROL CENTRE

1. GENERAL

The Chilean Mission Control Centre is co-located with the Santiago RCC and controls three LEOLUTs at the following locations:

	Latitude	Longitude
Punta Arenas	53° 00.36' S	070° 50.82' W
Santiago	33° 29.70' S	070° 42.24' W
Easter Island	27° 09.01' S	109° 26.22' W

These LEOLUTs can localise transmitters and distress beacons in local mode as well as global mode.

The local mode coverage of the Chilean LEOLUTs covers the areas of Argentina, Bolivia, Chile, Paraguay, Uruguay, part of Brazil, Peru, Pacific Ocean and Antarctica.

The CHMCC also controls one GEOLUT located in Santiago.

The CHMCC, LEOLUTs and GEOLUT operate 24 hours a day throughout the year.

The Chilean Air Force (FACH) is responsible for the operation of the Chilean MCC, LEOLUTs and GEOLUT.

2. SPOCs SUPPORTED

Bolivia
Chile
Paraguay
Uruguay

3. SYSTEM INFORMATION MESSAGES

The following System information messages are received/originated at CHMCC:

Orbit vectors: received from USMCC;
SARP calibration: received from USMCC;
System status: received and originated as required;
Narrative: received and originated as required.

4. BACK-UP PROCEDURES AND AGREEMENTS

In the unlikely event of a CHMCC failure, Chile has back-up agreements and the following procedures in place with the USA:

a. The CHMCC notifies the USMCC when the back service is required by phone or optionally by Email.

b. The USMCC notifies the CHMCC when back-up service commences by Phone, Fax or Email.

c. The USMCC sends a SIT 605 message notifying the other MCCs of the failure of the CHMCC and that the USMCC is performing back-up service according to section 3.7 of document C/S A.001. The USMCC also notifies the CHMCC's SPOCs of the same by SIT 915 message.

d. Once the failure is overcome, the CHMCC sends a SIT 605 message notifying the USMCC and other MCCs that the CHMCC has resumed normal operations. The CHMCC notifies its SPOCs by SIT 915 message that it has resumed normal operations.

e. As requested by the CHMCC, the USMCC retransmits SIT 183 messages previously sent to the CHMCC, to the CHMCC as MCC to MCC SIT formatted messages.

5. OTHER INFORMATION

Beacon Registration

406 MHz EPIRBs have been approved for carriage on Chilean vessels. A beacon register for Chilean beacons is maintained at the CHMCC.

- END OF THIS SECTION -

II / B.CN CNMCC - CHINESE MISSION CONTROL CENTRE

1. GENERAL

The Chinese Mission Control Centre is co-located with the China Maritime Search and Rescue Centre and controls two LEOLUTs installed at the Ministry of Communications at the following location:

Latitude	Longitude
39° 54.30' N	116° 25 00.05' N

The local mode of the Chinese LEOLUTs covers the main land of China, the East China Sea, the Yellow Sea and the part of the South China Sea.

Both LEOLUTs can locate transmitters and distress beacons in local mode as well as global mode. The Beijing (1) LEOLUT includes a Ground Search and Rescue Processor (G-SARP) to process the repeater band. The Beijing (2) LEOLUT is used as a back-up of Beijing (1).

The CNMCC and LEOLUTs operate 24 hours a day throughout the year and provide alert data to Chinese RCCs and to SPOCs within the CNMCC service area in accordance with document C/S A.001 and national procedures.

2. SPOCs SUPPORTED

The CNMCC provides primary support to Chinese RCCs.

The communication interfaces used by the CNMCC are:

AFTN FTP-PNV Voice Facsimile

3. SYSTEM INFORMATION MESSAGES

The following System information is received/originated at CNMCC:

Orbit vectors: received from JAMCC;
SARP calibration: received from JAMCC;
System status: originated to and received from JAMCC.

4. BACK-UP PROCEDURE AND AGREEMENTS

The LEOLUTs at Beijing, Daejeon, Nakhodka, among others, have overlapping local mode coverage areas. It is therefore feasible for one to back-up the other in case of failure or planned maintenance downtime. Co-operation in the coverage of individual satellites passes may also be feasible in the future.

In the unlikely event of a CNMCC failure, China has back-up agreements with Hong Kong.

5. OTHER INFORMATION

A register of maritime EPIRBs is maintained at China Transport Telecommunications Centre. The CNMCC is able to get access to the register.

- END OF THIS SECTION -

II / B.CO CMC - COSPAS MISSION CENTRE

1. GENERAL

The Cospas Mission Centre (i.e. the Russian Mission Control Centre) is located in Moscow and controls three national LUTs at the following locations (see Annex II / A):

	Latitude	Longitude
LEOLUT Moscow *	55° 44.60' N	037° 43.36' E
LEOLUT Nakhodka	42° 51.52' N	132° 47.44' E
GEOLUT Moscow *	55° 44.60' N	037° 43.36' E

Note: * Under development.

LEOLUTs can localise transmitters and distress beacons in local mode and global mode.

The local mode coverage of the Russian LEOLUTs includes Europe, northern and central parts of Asia, western part of North Pacific, north-eastern part of Africa.

The Russian MCC and LEOLUTs operate 24 hours per day throughout the year.

The CMC also assumes the nodal responsibilities for the Eastern DDR as defined at Annex III / A of this document.

The Agency Morsviazsputnik is responsible for operation of the Russian MCC and LEOLUTs.

2. SPOCs SUPPORTED

The CMC service area includes the territory of Armenia, Azerbaijan, Belarus, Bulgaria, Czech Republic, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Moldova, Mongolia, Poland, Romania, Russia, Slovakia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

The CMC routes alert data to RCCs of the Russian Federation and to other States in its service area and to the AUMCC, FMCC, INMCC, JAMCC, PAMCC, SPMCC and USMCC in accordance with the document C/S A.001 (DDP).

The following communication lines are used by the CMC:

Russian RCCs:	PSTN (Public Switched Telephone Network) communications, Fax
Russian LUTs:	FTP, PSTN communications
AUMCC:	FTP-VPN, AFTN
FMCC:	FTP-VPN, AFTN
INMCC:	FTP-VPN, AFTN (TBD)
JAMCC:	FTP-VPN, AFTN
PAMCC:	FTP-VPN, AFTN
SPMCC:	FTP-VPN, AFTN
USMCC:	FTP-VPN, AFTN

3. SYSTEM INFORMATION MESSAGES

The CMC originates and receives the following System information messages:

Orbit vectors:	originate to AUMCC, FMCC, INMCC, JAMCC, PAMCC, SPMCC and USMCC and receive from USMCC;
SARP calibration:	receive from FMCC, forward to INMCC and PAMCC;
System status:	originate to and receive from AUMCC, FMCC, INMCC, JAMCC, PAMCC, SPMCC and USMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The Russian LEOLUTs in Moscow and Arkhangelsk have largely overlapping local mode coverage areas, which is taken into account in planning satellite pass processing so that one LEOLUT backs up the other in the case of failure or planned maintenance downtime. In the event of CMC equipment failure, alert messages may be received or transmitted by Telephone. If the CMC is inoperative, Russian LEOLUTs forward their alert data to national RCCs.

All alert information obtained at CMC is archived for up to 90 days.

In the case of complete failure of the CMC, the FMCC will assume the duties of the CMC. FMCC will send validated Cospas-Sarsat alert data within the CMC service area to designated SPOCs or RCCs.

5. OTHER INFORMATION

Beacon Registration

A register on national units equipped with beacons is maintained at the CMC.

- END OF THIS SECTION -

II / B.FR FMCC - FRENCH MISSION CONTROL CENTRE

1. GENERAL

The French Mission Control Centre is co-located with dual LEOLUTs in Centre National d'Études Spatiales (CNES) technical centre in Toulouse (see Annex II / A). The LEOLUTs are equipped with dedicated antennas which makes possible tracking of all Cospas-Sarsat satellites passing over Toulouse, unless two satellites are in conflict (i.e. pass at the same time).

The dual LEOLUTs can localise transmitters and distress beacons in both the global and local modes. Interferers in the 406.0 MHz to 406.1 MHz frequency band are localised in the local mode and this information is provided to the French Telecommunication Administration for action through ITU. The Toulouse LEOLUTs provide local mode coverage of Europe, eastern half of North Atlantic and Africa to latitude 20 degrees North. Operations are 24 hours per day throughout the year. The French Administration (Civil Aviation and Maritime Affairs) is responsible for validation and transmission of alert data to MCCs and SPOCs, in accordance with C/S A.001 and national procedures.

The FMCC uses AFTN to forward alert data, as well as FTP-VPN.

The FMCC also assumes the nodal responsibilities for the Central DDR as defined at Annex III / A of this document.

2. SPOCs SUPPORTED

The French Mission Control Centre receives alert data from the Toulouse dual LEOLUT and GEOLUT and from other Cospas-Sarsat MCCs in accordance with the document C/S A.001.

It provides Cospas-Sarsat alert data to the following countries:

EUROPE:		AFRICA:	INDIAN OCEAN:	SOUTH AMERICAN REGION:
Andorra	Liechtenstein	Chad	Kerguelen Islands	
Austria	(via Switzerland SPOC)	Djibouti	Madagascar	Surinam
Belgium	Luxemburg	Morocco	Mauritius	
France	Monaco	Tunisia	Reunion	
Germany	Netherlands			
Gibraltar	Portugal			
	Switzerland			

CARIBBEAN:	ATLANTIC OCEAN:
Martinique	Azores
Saba	Madeira
Statia	
St. Maarten	

FMCC provides alert data by a French overseas SPOC to the following countries:

INDIAN OCEAN REGION: Comoros

SOUTH AMERICA REGION: Antigua, Saint Lucia, Saint Kitts and Nevis, Dominica

and the British overseas territories: Anguilla and Montserrat

PACIFIC REGION: Pitcairn

and to French overseas territories: Reunion Islands and Mayotte (Indian ocean), French West Indies, French Guiana (South American Region), French Polynesia (Pacific Region).

The listed countries are part of the FMCC service area, unless they indicate that they wish to receive the alert data from another MCC or start operation of their own LEOLUT/MCC.

Cospas-Sarsat alerts localised inside the FMCC service area are forwarded to the responsible SPOC or RCC. For alerts localised inside the FMCC service area in a country which has not designated a SPOC, the FMCC forwards alert data to the CROSS Gris Nez for handling in accordance with agreed international SAR regulation.

AFTN and FTP-VPN are used for communication with other MCCs. AFTN and Fax are used for communication with the supported SPOCs.

3. SYSTEM INFORMATION MESSAGES

The following System information messages are received/originated at FMCC:

SARP command:	originate to USMCC;
SARP command verification:	receive from USMCC;
System status:	originate and receive as required;
Narrative:	as required;
Orbit vectors:	receive from CMC and USMCC and forward to TRMCC, NMCC, and UKMCC;
SARP calibration:	originate to AUMCC, CMC, ITMCC, JAMCC, NMCC, SPMCC, UKMCC and USMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The Toulouse dual LEOLUTs have overlapping local mode coverage areas to a greater or lesser extent with the following LUTs: Bari, Combe Martin, Maspalomas, Ouargla and Tromsoe. It is therefore feasible for one to back up the other in the case of failure or planned maintenance downtime.

LUT/MCC operators will forward written notice of intention to perform maintenance routines involving deactivation of the LUT/MCC well in advance. The MCC will inform all other MCCs as soon as a decision has been taken, and confirm the times a minimum of two weeks prior to deactivation.

The LUT/MCC operator will inform the associated MCC by the quickest possible means, followed by a written confirmation when an estimate of the duration of the downtime is available. The MCC will immediately inform the other MCCs.

In the case of complete failure of the FMCC or in case of circumstances outside one's control, the SPMCC will assume the duties of the FMCC. SPMCC will send validated Cospas-Sarsat alert data, within the FMCC service area and/or within other areas to designated SPOCS or RCCs.

In the case of complete failure or unavailability of the ITMCC, the FMCC will assume the duties of the ITMCC. The FMCC will send validated Cospas-Sarsat alert data within the ITMCC service area and/or within other areas to designated RCCs or SPOCs.

In the case of a complete failure of the SPMCC, the FMCC will assume the duties of the SPMCC. FMCC will send validated Cospas-Sarsat alert data within the SPMCC service area and within other areas to designated SPOCs or RCCs. In the Spanish SRR this will be RCC Madrid and CNCS (MRCC). It was agreed to periodically exchange test messages between FMCC and the Spanish RCCs (RCC Madrid and CNCS) to check the communication links. All validated Cospas-Sarsat alert data within the South Central DDR service area will be directly transmitted to the South Central DDR destination MCCs.

In the case of complete failure of the CMC, the FMCC will assume the duties of the CMC. FMCC will send validated Cospas-Sarsat alert data within the CMC service area to designated SPOCs or RCCs.

5. OTHER INFORMATION

Nil.

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II / B.GR GRMCC - GREEK MISSION CONTROL CENTRE

1. GENERAL

The Greek Mission Control Centre is located at Piraeus, Greece. The GRMCC controls a LEOLUT and a GEOLUT located at Penteli Mountain (see location at Annex II /A).

The LUTs are located at the following co-ordinates:

	Latitude	Longitude
LEOLUT	38° 04.85′ N	023° 52.98′ E
GEOLUT	38° 04.85′ N	023° 52.98′ E

The LEOLUT can localise transmitters and distress beacons in local mode and global mode.

The GRMCC and LUTs operate 24 hours a day throughout the year.

The communication interfaces used by GRMCC are as follows:

FTP-VPN AFTN Facsimile Voice

2. SPOCs SUPPORTED

The GRMCC provides primary support to the Greek JRCC and routes alert and notification (NOCR) messages to other countries and can receive these messages from them.

3. SYSTEM INFORMATION MESSAGES

The following System Information messages are received/originated at GRMCC:

Orbit vectors:	receive from FMCC;
SARP calibration:	receive from FMCC;
System status:	originate to and receive from FMCC;
Narrative:	received and originated as required.

4. BACK-UP PROCEDURES AND AGREEMENTS

The GRMCC operates two Operational Control Consoles (OCC), one of them being a back-up. In the event of GRMCC becomes unserviceable, Greece has back-up agreements and procedures in place with Italy. The following procedures have been agreed:

a) The GRMCC notifies the ITMCC whenever the back-up service is required by means of Fax, Phone or Email. GRMCC notices ITMCC about the alert events which were handling before the failure.

b) The ITMCC notifies the GRMCC when the back-up service commences by Fax/Phone or Email.

c) The ITMCC sends a SIT 605 message notifying the other MCCs of the GRMCC failure, and that the ITMCC is performing back-up service according to section 3.7, document C/S A.001.

d) The ITMCC transmits alerts for the Greek service area in SIT 185 format to Greek JRCC using the Greek JRCC Telex (primary communication link) or via Fax.

e) In the event that the ITMCC is unable to communicate with the JRCC as described above, the ITMCC shall ÷ transmit alerts for the GRMCC service area in SIT 185 format to the GRMCC via Fax. In that case, the ITMCC will advise the GRMCC of their inability to communicate with the Greek JRCC.

f) The GRMCC advises the Greek JRCC about the GRMCC failure and about the back-up procedures.

g) The GRMCC will notify the ITMCC as soon as the problem is solved, and will advise the time when the GRMCC plans to restore normal operations.

h) When the GRMCC returns to normal operations it will send a SIT 605 message notifying the ITMCC and other MCCs that the GRMCC has resumed normal operations. The GRMCC also notifies Greek JRCC that it has resumed normal operations.

i) The ITMCC will send all requested missing messages to the GRMCC and will notice it about the events handled during the back-up.

j) The ITMCC shall contact with GRMCC by means of:

Phone: +30 210 4082690
Fax: + 30 210 4082870
Email: grmcc@yen.gr
AFTN : LGGGYCYC

k) The ITMCC shall contact with JRCC Piraeus by means of:

Phone: +30 210 4112500 Maritime section
+30 210 4191599 Aviation section
AFTN: LGGGYCYX
Fax: +30 210 4132398
Telex: 601 211588 RCC GR
Email: jrccpgr@yen.gr
eksedat@gmail.com

l) The GRMCC shall contact with ITMCC by means of:

Phone: +39 080 5341053 – 5341571 - 5344033
Fax: +39 080 5342145
Email: itmccoperator@cospas-sarsat-italy.it

5. OTHER INFORMATION

Beacon Registration

a) A database of the Greek register for MMSIs (maritime beacons are coded only with MMSI) is maintained by the Merchant Ships Inspectorate / Radio Communication Department of Ministry of Development, Competitiveness and Shipping, with a copy at the GRMCC.

b) A database of the Greek register for aviation Cospas-Sarsat beacons is maintained by the Directorate General of Air Navigation / Communication Division of Civil Aviation Authority, with a copy at the GRMCC.

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II / B.HK HKMCC - HONG KONG MISSION CONTROL CENTRE

1. GENERAL

The Hong Kong Mission Control Centre is located on Hong Kong Island in the MRCC controlling two advanced technology LEOSAR Local User Terminals (dual LEOLUT system) located on the Peak on Hong Kong Island at the following location:

Latitude	Longitude
22° 16.56' N	114° 08.76' E

Both LEOLUTs can locate transmitters and distress beacons in local mode as well as global mode.

The local mode coverage of the Hong Kong LEOLUT covers the area from Mongolia in the north to the south of Indonesia and from the eastern side of the Indian Ocean to the western part of the Pacific.

The HKMCC and LEOLUTs both operate 24 hours a day and provide alert data to countries within the HKMCC service area in accordance with document C/S A.001 and national procedures.

A second operator control console (OCC) is available as a back-up MCC and is located at the VTC in Macau Ferry Terminal.

The Marine Department of Hong Kong is responsible for the operation of the HKMCC and the HKLEOLUT.

2. SPOCs SUPPORTED

Democratic People's Republic of Korea (prior to 1 December 2011, a KOMCC supported SPOC)
Hong Kong, China
Macau
Philippines

The communications interfaces used by the HKMCC are:

FTP-VPN AFTN Facsimile Voice

3. SYSTEM INFORMATION MESSAGES

The following System information is received/originated at HKMCC:

Orbit vectors: receive from JAMCC;
SARP calibration: receive from JAMCC;

System status: originate to and receive from JAMCC.

4. BACK-UP PROCEDURE AND AGREEMENTS

The HKMCC established a mutual back-up procedure with the TAMCC for system outage on either side.

In the case of complete failure of the CNMCC, the HKMCC will assume the duties of the CNMCC.

In the case of complete failure of the VNMCC, the HKMCC will assume the duties of the VNMCC.

The LUTs at Hong Kong, Singapore and Japan have overlapping local mode coverage areas to a greater or lesser extent. It is therefore feasible for the Hong Kong area to be fully covered in the case of failure or planned maintenance downtime.

5. OTHER INFORMATION

Beacon Registration

A register of beacons is maintained at the HKMCC.

- END OF THIS SECTION -

II / B.ID IDMCC - INDONESIA MISSION CONTROL CENTRE

1. GENERAL

The Indonesia Mission Control Centre is collocated with one Local User Terminal in Jakarta. The IDMCC controls two advanced technology Local User Terminals (ATLUT System) located in Jakarta and Makassar at the following locations:

	Latitude	Longitude
Makassar	05°04.00' S	119°33.00' E
Jakarta	06°07.53' S	106°39.47' E

These LUTs can locate transmitters and distress beacons in local mode as well as global mode.

The local mode coverage of the Indonesia LUTs is able to cover the area of Brunei, Malaysia, Singapore, Papua New Guinea, Thailand (ASEAN Area) as well as Laos, Myanmar, South of Philippines and North Australia.

The IDMCC and LUTs operate 24 hours a day (seven days a week) throughout the year.

The National SAR Agency (BASARNAS) is responsible for the operation of the IDMCC/LUTs.

2. SPOCs SUPPORTED

The IDMCC provides primary support to East Timor and twenty-four Indonesia RCCs and routes alert and notification (NOCR) messages to other countries and can receive these messages from them.

The communications interfaces used by IDMCC:

FTP-VPN AFTN Facsimile Voice

3. SYSTEM INFORMATION MESSAGES

The IDMCC originates and receives System information to/from the AUMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The LUTs in Indonesia, Singapore and Australia have overlapping local mode coverage to greater or less extent. It is therefore feasible for the Indonesia to be fully covered in the case of failure or planned maintenance downtime.

In the event the IDMCC becomes unserviceable, the SIMCC will provide back-up support to the IDMCC. All the alerts for the IDMCC service area will be transmitted in SIT 185 format to a fax number nominated by the IDMCC or via AFTN.

5. OTHER INFORMATION

Beacon Registration

A register of national ships equipped with beacons is maintained by the National SAR Agency.

- END OF THIS SECTION -

II / B.IN INMCC - INDIAN MISSION CONTROL CENTRE

1. GENERAL

The Indian Mission Control Centre is located at Bangalore and controls two national LEOLUTs at the following locations:

	Latitude	Longitude
Bangalore	13°02.09' N	077°30.70' E
Lucknow	26°54.80' N	080°57.44' E

These LEOLUTs can locate transmitters and distress beacons radiating in both local mode as well as global mode.

The local mode coverage of the Indian LEOLUTs includes the entire Indian sub-continent and the adjacent sea regions and islands.

The INMCC also controls one GEOLUT located in Bangalore.

The Indian MCC and LUTs operate 24 hours a day throughout the year.

The Indian Space Research Organization (ISRO) of the Department of Space, Government of India is responsible for the operation of the Indian MCC and LUTs.

2. SPOCs SUPPORTED

Bangladesh	Maldives	Sri Lanka
Bhutan	Nepal	Tanzania
India	Seychelles	

3. SYSTEM INFORMATION MESSAGES

The INMCC originates and receives the following System information:

Orbit vectors:	receive from CMC;
SARP calibration:	receive from CMC;
System status:	originate to and receive from CMC.

4. BACK-UP PROCEDURES

The Indian LEOLUTs at Bangalore and Lucknow have large local mode overlaps which are taken into account in planning satellite pass scheduling.

In the unlikely event of the INMCC failure, the INMCC has back-up agreements with the CMC.

5. OTHER INFORMATION

Beacon Registration

There is a plan to maintain a register of national units equipped with beacons at the INMCC.

- END OF THIS SECTION -

II / B.IT ITMCC - ITALIAN MISSION CONTROL CENTRE

1. GENERAL

The Italian Mission Control Centre is located in Bari, at the Italian Coast Guard Naval Base, together with one LEOLUT and one GEOLUT (see Annex II / A).

The LEOLUT is equipped with an antenna which tracks all Cospas-Sarsat satellites passing over Bari, unless two satellites are in conflict. The LEOLUT is able to localise transmitters and distress beacons in local mode and global mode. Interferers in the 406.0 MHz to 406.1 MHz frequency band are localised in the local mode and forwarded to the Italian Telecommunication Authority for subsequent action through the ITU.

The Bari LEOLUT provides local mode coverage in South-East and Central part of Europe, the Mediterranean Sea, part of Middle-East Asia and part of Central and East Africa, from latitude 71° N to 11° N.

The ITMCC works 24 hours per day throughout the year. A dedicated team is responsible for validation of alert data and transmission to MCCs and SPOCs throughout the world, in accordance with document C/S A.001 and national procedures. ITMCC is equipped with a back-up server which replaces the primary one in case of failure or scheduled downtime for maintenance. All the Cospas-Sarsat alert data are continuously replicated in the back-up server, hence, in case of primary unexpected outage the MCC operator could switch on the back-up server in a very short time.

Concerning communication links, the ITMCC uses FTP-VPN to exchange data with MCCs and when not available AFTN. To send Cospas-Sarsat alert data to SPOCs or RCCs the ITMCC uses AFTN and Fax. Telephone communications are also available with national and international SAR contacts.

2. SPOCs SUPPORTED

The Italian Mission Control Centre receives alert data from the Bari LEOLUT and GEOLUT and from other MCCs according to document C/S A.001. It provides alert data to the following countries:

AFRICA:

Eritrea	Somalia
Ethiopia	Sudan
Kenya	

ASIA:

Israel

EUROPE:

Albania	Malta	Slovenia
Bosnia and Herzegovina	Montenegro	The Former Yugoslav Rep. of Macedonia
Croatia	Palestine	Vatican City
Cyprus	San Marino	
Italy	Serbia	

3. SYSTEM INFORMATION MESSAGES

The following messages are received or originated at the Italian MCC:

System status:	originate and receive as required;
Narrative:	as required;
Orbit vectors:	receive via FMCC;
SARP calibration:	receive via FMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The Bari LEOLUT has overlapping local mode coverage areas with the following LEOLUTs in the Central Data Distribution Region: Combe Martin, Toulouse, Tromsoe, Penteli and Ankara. It is feasible for one to back-up the other in case of failure or planned maintenance downtime.

LUT operators will forward written advance notice of routine maintenance deactivation of the LUT. The MCC will advise all others MCCs as soon as decision has been taken and confirm the times a minimum of two weeks before deactivation. In case of failure, the LUT operators will inform the MCC which will notice the downtime to other MCCs in CDDR using the appropriate SIT message.

In the case of complete failure or unavailability of the ITMCC, the FMCC will assume the duties of the ITMCC sending the SIT 605 to all MCCs notifying the ITMCC failure. The FMCC will send validated Cospas-Sarsat alert data within the ITMCC service area to designated RCCs or SPOCs.

ITMCC provides back-up to GRMCC and TRMCC in case of their scheduled or not scheduled downtimes according to agreements established with these MCCs.

5. OTHER INFORMATION

Beacon Registration

The ITMCC provides registration of EPIRBs, ELTs and PLBs. The ITMCC maintains the beacon registry and provides information 24 hours per day throughout the year to SPOCs or RCCs.

- END OF THIS SECTION -

II / B.JA JAMCC - JAPAN MISSION CONTROL CENTRE

1. GENERAL

The Japan Mission Control Centre is located at the Japan Coast Guard Headquarters in Tokyo. The JAMCC controls one LEOLUT at Gunma at the following location:

Latitude	Longitude
36°25.56' N	138°57.30' E

The Japan LEOLUT can localise transmitters and distress beacons in local mode as well as global mode.

The local mode coverage of the Japan LEOLUT covers the area from Russia in the north to the western part of the Pacific and from China in the west to the central part of the Pacific.

The JAMCC and LUT operate 24 hours a day and send alert data to national RCCs within the JAMCC service area in accordance with document C/S A.001 and national procedures.

The JAMCC also assumes the nodal responsibilities for the Northwest Pacific DDR as defined at Annex III / A of this document.

The Japan Coast Guard (JCG) is responsible for the management and operation of the Japan Cospas-Sarsat ground segment.

2. SPOCs SUPPORTED

Japan

3. SYSTEM INFORMATION MESSAGES

The following System information is received/originated at JAMCC:

Orbit vectors:	receive from CMC, USMCC and forward to CNMCC, HKMCC, KOMCC, TAMCC and VNMCC;
SARP calibration:	receive from FMCC and forward to CNMCC, HKMCC, KOMCC, TAMCC and VNMCC;
System status:	originate, receive and forward from/to AUMCC, CMC, FMCC, USMCC, CNMCC, HKMCC, KOMCC, SPMCC, TAMCC and VNMCC.

4. BACK-UP PROCEDURE AND AGREEMENTS

In the event of a failure of the nodal JAMCC, the duty personnel will:

a. contact and advise the USMCC to assume JAMCC nodal responsibilities;

b. contact and advise the CNMCC, HKMCC, KOMCC, TAMCC and VNMCC to divert all their traffic to the USMCC and to expect System information direct from the USMCC;

c. request the USMCC to transmit JAMCC service area alerts in SIT 185 format. The JAMCC will attempt to pass them to its service area RCCs/SPOCs by manually geosorting them; and

d. advise the USMCC that JAMCC will pass alerts from Japanese LUTs in some form on a 'best effort' basis.

5. OTHER INFORMATION

Beacon Registration

A beacon register on national units equipped with beacons is maintained at the JAMCC.

- END OF THIS SECTION -

II / B.KO KOMCC - KOREA MISSION CONTROL CENTRE

1. GENERAL

The Korea Mission Control Centre is located at the Korea Coast Guard Headquarters (KCG) in Incheon and controls one LEOLUT at the following location:

Latitude	Longitude
37° 23.58' N	126° 38.94' E

The local mode of the Korea LEOLUT covers the area from the eastern part of Russia in the north to the Philippines and from the eastern part of China in the west to the western part of Pacific Ocean.

The LUT can locate transmitters and distress beacons in local mode as well as global mode.

The Korea MCC and LUT operate 24 hours a day throughout the year and send alert data to countries within the KOMCC service area in accordance with document C/S A.001and national procedures.

The Korea Coast Guard is responsible for the operation of the KOMCC and LUT.

2. SPOCs SUPPORTED

Democratic People's Republic of Korea (from 1 December 2011, an HKMCC supported SPOC)
Korea (Republic of)

3. SYSTEM INFORMATION MESSAGES

The following System information is received/originated at KOMCC:

Orbit vectors: received from JAMCC;
SARP calibration: received from JAMCC;
System status: originated to and received from JAMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The LEOLUTs at Incheon and Yokohama have overlapping local mode coverage areas. It is therefore feasible for one to back-up the other in case of failure or planned maintenance downtime. Co-operation in the coverage of individual satellites passes may also be feasible in the future.

In the case of complete failure of the KOMCC, the JAMCC will assume the duties of the KOMCC. The following procedures apply:

a. Incheon LEOLUTs manually forward their alert data to the selected SPOCs/RCCs; and

b. the JAMCC provides alert data to the KOMCC via Fax for further distribution to SPOCs/RCCs by the KOMCC.

5. OTHER INFORMATION

Beacon Registration

A database of the Korean registered beacons is maintained at the KOMCC.

- END OF THIS SECTION -

II / B.NI NIMCC - NIGERIA MISSION CONTROL CENTRE

1. GENERAL

The Nigeria Mission Control Centre is co-located with one LEOLUT in the National Emergency Management Agency Building at the following location:

Latitude	Longitude
09° 04.56' N	007° 29.58' E

The local mode of the Abuja LEOLUT covers Central Africa and the Eastern part of the Atlantic Ocean. The LEOLUT can locate transmitters and distress beacons in local mode as well as global mode. The Nigeria MCC and LEOLUT operate 24 hours a day throughout the year and send alert data to MCCs and SPOCs, in accordance with the document C/S A.001 and national procedures.

2. SPOCs SUPPORTED

Nigeria

3. SYSTEM INFORMATION MESSAGES

The following System information is received/originated at NIMCC:

Orbit vectors: receive from SPMCC;
SARP calibration: receive from SPMCC;
System status: originate to and receive from SPMCC.

4. BACK-UP PROCEDURE AND AGREEMENTS

In case of complete failure of the NIMCC, the SPMCC will assume the duties of the NIMCC. The SPMCC will send validated Cospas-Sarsat alert data within the NIMCC service area to designated SPOCs or RCCs.

5. OTHER INFORMATION

A database of registered beacons is maintained by the National Maritime Authority and Nigeria Civil Aviation Authority.

- END OF THIS SECTION -

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II / B.NO NMCC - NORWEGIAN MISSION CONTROL CENTRE

1. GENERAL

The Norwegian Mission Control Centre is a combination between the LEOLUTs in Tromsoe and Spitsbergen, a GEOLUT at Fauske and MCC in Bodoe. These form the NMCC with the Tromsoe and Spitsbergen LEOLUTs and the GEOLUT at Fauske as the technical bodies of the MCC, and MCC Bodoe as the operational body. The NMCC is integrated and co-located with JRCC Bodoe.

Two LEOLUTs are installed at the following locations:

	Latitude	Longitude
Tromsoe	69° 39.74' N	018° 56.42' E
Spitsbergen	78° 13.74' N	015° 29.76' E

The GEOLUT is installed at the following location:

	Latitude	Longitude
Fauske	67° 14.14' N	015° 17.87' E

The NMCC also provides global mode locations. The NMCC operates 24 hours per day, 7 days a week.

The Ministry of Justice and Police is responsible for the coordination of SAR.

2. SPOCs SUPPORTED

The NMCC provides alert data to SPOCs in the NMCC service area including:

Denmark	Greenland	Norway
Estonia	Iceland	Sweden
Faroe Islands	Latvia	
Finland	Lithuania	

A summary of communication systems for these interfaces follows:

SPOCs in NMCC service area:	FTP	AFTN	Fax	Voice
FMCC:	FTP-VPN	AFTN	Fax	Voice
ITMCC:	FTP-VPN	AFTN	Fax	Voice
UKMCC:	FTP-VPN	AFTN	Fax	Voice
TRMCC:	FTP-VPN	AFTN	Fax	Voice
GRMCC:	FTP-VPN	AFTN	Fax	Voice
SPMCC (nodal Back-up):	FTP-VPN	AFTN	Fax	Voice

3. SYSTEM INFORMATION MESSAGES

NMCC originates and receives the following System information messages:

System status:	originate and receive, normally through FMCC;
Narrative:	for status messages;
SARP calibration:	via FMCC;
Orbit vectors:	via FMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The Tromsoe and Spitsbergen LEOLUTs have overlapping local mode coverage areas to a greater or lesser extent with the following LEOLUTs: Combe Martin and Toulouse. It is therefore feasible for one to back up the other in the case of failure or planned maintenance downtime.

In the case of complete failure of the NMCC, the UKMCC will assume the duties of the NMCC. UKMCC will send validated Cospas-Sarsat alert data, within the NMCC service area to designated SPOCs or RCCs. In the Norwegian SRRs this will be JRCC Stavanger.

In the case of complete failure of the UKMCC, the NMCC will assume the duties of the UKMCC. NMCC will send validated Cospas-Sarsat alert data, within the UKMCC service area to designated SPOCs or RCCs. In the UK SRRs this will be MRCC Falmouth.

5. OTHER INFORMATION

NMCC has access 24/7 to the Norwegian beacon registries (EPIRBs, ELTs and PLBs with country codes 257, 258 and 259).

- END OF THIS SECTION -

II / B.PA PAMCC - PAKISTAN MISSION CONTROL CENTRE

1. GENERAL

The Pakistan Mission Control Centre is located at the Space Research Centre (SPARCENT), SUPARCO Karachi and controls one Local User Terminal (LUT) and two Rescue Coordination Centres (RCCs) at Karachi:

Latitude	Longitude
24° 56.76' N	067° 08.16' E

The PALUT can locate distress beacons in local mode, as well as in global mode. In addition, the PALUT can process the repeater channel for interference monitoring.

The local mode-coverage of the PALUT includes countries from Saudi Arabia to China and the Commonwealth of Independent States (CIS) to Sri Lanka.

The PALUT and PAMCC are operating 24 hours a day throughout the year. The Pakistan Space and Upper Atmospheric Research Commission (SUPARCO) is responsible for the PALUT and PAMCC operations while RCC1 is operated by Pakistan Civil Aviation Authority (CAA) and RCC2 is operated by Pakistan Maritime Security Agency (MSA).

2. SPOCs SUPPORTED

Pakistan

3. SYSTEM INFORMATION MESSAGES

The PAMCC receives and originates System status information from/to the CMC.

4. BACK-UP PROCEDURES AND AGREEMENTS

In the unlikely event of the PAMCC failure, the PAMCC has back-up agreements with the CMC.

5. OTHER INFORMATION

A register of national units equipped with beacons will be maintained in the IBRD and locally at PAMCC.

- END OF THIS SECTION -

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II / B.PE PEMCC - PERUVIAN MISSION CONTROL CENTRE

1. GENERAL

The Peruvian Mission Control Centre is located in Callao and controls one advanced technology LEOLUT Local User Terminal at the following location:

Latitude	Longitude
12° 01.62' S	077° 07.62' W

This LUT can localise transmitters and distress beacons in local mode as well as global mode.

The local mode coverage of the Peruvian LUT covers the areas of Bolivia, Colombia, Costa Rica, Ecuador, French Guiana, Guatemala, Guyana, Panama, Paraguay, Surinam, Uruguay, Venezuela, and parts of Argentina, Brazil, and Chile, and extends 3,000 nm into the Pacific Ocean to the West.

The PEMCC and LUT operate 24 hours a day throughout the year.

The General Direction of Captaincies and Coast Guards of the Peruvian Navy (DICAPI) is responsible for the PELUT, PEMCC and Peruvian RCC's operations.

2. SPOCs SUPPORTED

PEMCC provides primary support to the Peruvian RCCs.

3. SYSTEM INFORMATION MESSAGES

The following System information is received/originated at PEMCC:

Orbit vectors:	received from USMCC;
SARP calibration:	received from USMCC;
System status:	received and originated as required;
Narrative:	received and originated as required.

4. BACK-UP PROCEDURES AND AGREEMENTS

In the unlikely event of a PEMCC failure, Peru has a back-up agreement with Argentina. In accordance with the following procedures, the ARMCC will assume the duties of the PEMCC:

a. The PEMCC notifies the ARMCC when the back-up service is required by Phone or optionally by Email.

b. The ARMCC notifies the PEMCC when back-up service commences by Phone, Fax or Email.

c. The ARMCC sends a SIT 605 message notifying all MCCs of the PEMCC failure and that the ARMCC is performing back-up service according to section 3.7 of document C/S A.001.

d. The ARMCC transmits alerts for the Peruvian service area in SIT 185 format to PEMCC via Fax or Email;

e. Once the failure is overcome, the PEMCC sends a SIT 605 message notifying the ARMCC and all MCCs that the PEMCC has resumed normal operations.

f. The ARMCC will send all requested missing messages to the PEMCC.

5. OTHER INFORMATION

406 MHz EPIRBs have been approved for carriage on Peruvian vessels. A beacon register of Peruvian beacons is maintained at the PEMCC.

The PEMCC is responsible for the allocation of serial numbers for all serialized coded beacons and the maintenance of the Peruvian 406 MHz beacon database register and can be contacted at any time to obtain database information. Purchasers of 406 MHz beacons are required to follow the registration procedure provided in DICAPI's Unique Text of Administrative Procedures (TUPA): www.serviciosalciudadano.gob.pe/tramites/11794/3413.htm.

- END OF THIS SECTION -

II / B.SA SAMCC - SAUDI ARABIAN MISSION CONTROL CENTRE

1. GENERAL

The Saudi Arabian Mission Control Centre is co-located with the RCC in Jeddah. The SAMCC controls two LEOLUTs with G-SARP. These two LUTs are located at:

Latitude	Longitude
21 ^{o} 39.90' N	039 ^{o} 08.76' E

These two LEOLUTs are known as SALUT1 (ID: 4031) and SALUT2 (ID: 4032) and provide local mode coverage of the whole Middle East region.

The Saudi MCC and LEOLUTs operate 24 hours a day throughout the year providing alert data through the co-located RCC.

The Saudi General Authority of Civil Aviation (GACA) is responsible for the management and operation of the Saudi Cospas-Sarsat ground segment.

2. SPOCs SUPPORTED:

Bahrain	Oman	United Arab Emirates
Jordan	Qatar	Yemen
Kuwait	Saudi Arabia	
Lebanon	Syria	

The communication interfaces used by the SAMCC are:

FTP-VPN AFTN

3. SYSTEM INFORMATION MESSAGES

The SAMCC originates and receives the following System information messages:

Orbit vectors:	receive from SPMCC;
SARP calibration:	receive from SPMCC;
System status:	originate and receive from SPMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

In the case of complete failure of the SAMCC, the SPMCC will assume the duties of the SAMCC. SPMCC will send validated Cospas-Sarsat alert data within the SAMCC service area to designated SPOCs or RCCs.

5. OTHER INFORMATION

To be determined.

- END OF THIS SECTION -

II / B.SI SIMCC - SINGAPORE MISSION CONTROL CENTRE

1. GENERAL

The Singapore Mission Control Centre is located at the Singapore Air Traffic Control Centre, LORADS Complex, Biggin Hill at the following location:

Latitude	Longitude
01° 23.40' N	103° 59.10' E

Singapore's LEOLUT at Changi Airport Terminal 2 can locate transmitters and distress beacons in local mode as well as global mode.

The local mode coverage of Singapore LEOLUT is able to cover the ASEAN areas (Brunei, Indonesia, Malaysia, Singapore and South West of Philippines) as well as Cambodia, Laos, Myanmar and North West of Australia.

A second operator control console (OCC) serves as a back-up MCC and is located at the LORADS Complex Rescue Co-ordination Centre (RCC). A third OCC is located at the Maritime and Port Authority of Singapore, Tanjong Pagar Complex.

The Singapore MCC and LEOLUT operate 24 hours a day throughout the year.

The Civil Aviation Authority of Singapore and the Maritime Authority of Singapore are responsible for the operation of the Singapore LEOLUT and MCC.

2. SPOCs SUPPORTED

The SIMCC can provide alert data to SPOCs in the SIMCC service area including:

Brunei	Myanmar
Malaysia	Singapore

The communication interfaces used by SIMCC are:

AUMCC:	FTP-VPN	AFTN	Voice
SPOCs:	AFTN	Voice	

3. SYSTEM INFORMATION MESSAGES

The SIMCC originates and receives the following System information messages:

Orbit vectors: receive from AUMCC;
SARP calibration: receive from AUMCC;
System status: originate and receive from AUMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The LEOLUTs at Singapore, Australia, India and Hong Kong have overlapping local mode coverage areas to a greater or lesser extent. It is therefore feasible for the Singapore area to be fully covered in the case of failure or planned maintenance downtime.

In the event the SIMCC becomes unserviceable, the THMCC will provide back-up support to the SIMCC. All the alerts for the SIMCC service area will be transmitted in SIT 185 format to a Fax number nominated by the SIMCC or via AFTN.

The SIMCC is a back-up of the THMCC and IDMCC. Should the THMCC or IDMCC become unserviceable, messages will be passed via AFTN or Fax.

5. OTHER INFORMATION

Beacon Registration

A register of national ships equipped with beacons is maintained by the Maritime and Port Authority. Users of maritime EPIRBs installed on Singapore ships are required to register their EPIRBs with the Singapore Register, the Telecommunication Authority of Singapore (TAS), Radio Standard/Licensing Department.

A register of all aviation beacons are maintained by the Civil Aviation Authority of Singapore (CAAS). Users of aviation beacons carried on board Singapore registered aircraft are required to register their beacons with the CAAS. A register for both aviation and maritime beacons is available at the SIMCC.

- END OF THIS SECTION -

II / B.SP SPMCC - SPANISH MISSION CONTROL CENTRE

1. GENERAL

The Spanish Mission Control Centre is co-located with one LEOLUT in Instituto Nacional de Técnica Aeroespacial (INTA) at the Maspalomas Tracking Station in Gran Canaria, at the following location:

Latitude	Longitude
27°45.68' N	015°37.90' W

The LEOLUT is equipped with a dedicated antenna which makes possible tracking of all Cospas-Sarsat satellites passing over Canary Islands, unless satellites are in conflict.

The LEOLUT can localise transmitters and distress beacons in local mode and global mode. Interferers in the 406.0 MHz to 406.1 MHz band are localised in the local mode, and this information is provided to the Spanish Telecommunication Administration for action through ITU. The Maspalomas LEOLUT provides local mode coverage of North-Central Atlantic and North West Africa to latitude 0 degrees and operates 24 hours per day throughout the year.

The SPMCC also controls two GEOLUTs which are co-located with the LEOLUT.

Alert data are validated and transmitted to MCCs and SPOCs, in accordance with document C/S A.001 and national procedures.

The SPMCC also assumes the nodal responsibilities for the South Central DDR as defined at Annex III / A of this document.

2. SPOCs SUPPORTED

The Spanish Mission Control Centre receives alert data from the Maspalomas LEOLUT and GEOLUTs and from other Cospas-Sarsat MCCs in accordance with document C/S A.001. It provides Cospas-Sarsat alert data to the following countries:

Benin	Gabon	Mauritania
Cameroon	Gambia	Sao Tome and Principe
Cape Verde	Ghana	Senegal
Central Africa Republic	Guinea	Sierra Leone
Congo	Guinea-Bissau	Spain
Côte d'Ivoire	Liberia	Togo
Equatorial Guinea	Mali	

The communication interfaces used by the SPMCC are:

AEMCC:	FTP-VPN	AFTN	
ALMCC:	FTP-VPN	X.25	AFTN
AUMCC:	FTP-VPN	AFTN	
CMC:	FTP-VPN	AFTN	
FMCC:	FTP-VPN	AFTN	
JAMCC:	FTP-VPN	AFTN	
NIMCC:	FTP-VPN	AFTN	
SAMCC:	FTP-VPN	AFTN	
USMCC:	FTP-VPN	AFTN	

3. SYSTEM INFORMATION MESSAGES

The following System information is received/originated at SPMCC:

Orbit vectors: receive from CMC and USMCC and forward to AEMCC, ALMCC, NIMCC and SAMCC;

SARP calibration: receive from FMCC and forward to AEMCC, ALMCC, NIMCC and SAMCC;

System status: originate, receive from and forward to AEMCC, ALMCC, AUMCC, CMC, FMCC, JAMCC, NIMCC, SAMCC and USMCC.

4. BACK-UP PROCEDURE AND AGREEMENTS

The Maspalomas LEOLUT has overlapping local mode coverage areas with the following LEOLUTs: Abuja, Bari, Combe Martin, Maspalomas, Ouargla and Toulouse. It is feasible for one to back-up the other in case of failure or planned maintenance downtime. Co-operation in the coverage of individual satellite passes may also be feasible in the future.

The LUT operators will forward written advance notice of routine maintenance deactivation of a LUT. The MCC will advise all others MCCs as soon as decision has been taken and confirm the times a minimum of two weeks before deactivation. In case of failure, the LUT operators will inform the associated MCC in the quickest possible way followed by a written confirmation when an estimate of the duration of the downtime is available. The MCC will inform immediately the MCCs in South Central DDR and the nodal MCCs.

In the case of a complete failure of the SPMCC, the FMCC will assume the duties of the SPMCC. FMCC will send validated Cospas-Sarsat alert data within the SPMCC service area and within other areas to designated SPOCs or RCCs. In the Spanish SRR this will be RCC Madrid and CNCS (MRCC). It was agreed to periodically exchange test messages between FMCC and the Spanish RCCs (RCC Madrid and CNCS) to check the communication links. All validated Cospas-Sarsat alert data within the South Central DDR service area will be directly transmitted to the destination MCC.

In the case that SPMCC has to assume the backup duties for FMCC, SPMCC will be able to process and relay the alert messages originally created for FMCC, that is to say, with MF#5 set to 2270.

In the case of complete failure of the AEMCC, the SPMCC will assume the duties of the AEMCC. The SPMCC will send validated Cospas-Sarsat alert data within the AEMCC service area to Abu Dhabi SAR Coordination Center for further distribution to AEMCC designated SPOCs or RCCs.

In the case of a complete failure of the ALMCC, the SPMCC will assume the duties of the ALMCC. The SPMCC will send validated Cospas-Sarsat alert data within the ALMCC service area to designated SPOCs or RCCs. In the Algerian SRR this will be Algiers RCC (this AFTN address is DAALZSZX).

In the case of a complete failure of the NIMCC, the SPMCC will assume the duties of the NIMCC. The SPMCC will send validated Cospas-Sarsat alert data within the NIMCC service area to designated SPOCs or RCCs.

In the case of a complete failure of the SAMCC, the SPMCC will assume the duties of the SAMCC. The SPMCC will send validated Cospas-Sarsat alert data within the SAMCC service area to designated SPOCs or RCCs.

5. OTHER INFORMATION

Beacon Registration

A database of the Spanish register for maritime Cospas-Sarsat beacons is maintained by the General Directorate of Merchant Navy, and another database of the Spanish register for aviation Cospas-Sarsat beacons is maintained by the General Directorate of Civil Aviation, with a copy of both databases at the SPMCC.

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II / B.TA TAMCC - ITDC / TAIPEI MISSION CONTROL CENTRE

1. GENERAL

The ITDC / Taipei Mission Control Centre is located in the Taipei Air Navigation and Weather Services (ANWS), Civil Aeronautics Administration (CAA), at Taipei domestic airport. Two LEOSAR Local User Terminals (dual LEOLUT system) are located at Keelung Coast Radio Station with the following co-ordinates:

Latitude	Longitude
25° 08.10' N	121° 45.42' E

Both LEOLUTs can localise transmitters and distress beacons in local mode and global mode.

The local mode coverage of the ITDC LEOLUTs includes the area from Eastern part of the Indian Ocean to Western part of the Pacific Ocean.

The TAMCC and LEOLUTs operate 24 hours a day throughout the year.

The Civil Aeronautics Administration and the Maritime Department of the Ministry of Transport and Communications are responsible for the operation of the TAMCC and LEOLUTs.

2. SPOCs SUPPORTED

The TAMCC provides primary support to Chinese Taipei RCCs.

The communication interfaces used by TAMCC are:

X.25 AFTN Telex Voice Facsimile

3. SYSTEM INFORMATION MESSAGES

The TAMCC originates and receives the following System information messages:

Orbit vectors: receive from USMCC;
SARP calibration: receive from USMCC;
System status: originate to and receive from USMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The TAMCC established a mutual back-up procedure with the HKMCC for system outage on either side.

ITDC LEOLUTs have overlapping local mode coverage areas to a greater or lesser extent with the following LEOLUTs: Guam, Hong Kong, Jakarta, Nakhodka, Singapore, Daejeon and Yokohama. It is therefore feasible for the Chinese Taipei area to be fully covered in the case of failure or planned maintenance downtime.

5. OTHER INFORMATION

Beacon Registration

A register of national ships equipped with beacons is maintained by the Directorate General of Telecommunications (DGT). Users of maritime EPIRBs installed on Chinese Taipei ships are required to register their EPIRBs with the Directorate General of Telecommunications (DGT), Radio Standard/Licensing Department.

- END OF THIS SECTION -

II / B.TH THMCC - THAILAND MISSION CONTROL CENTRE

1. GENERAL

The Thailand Mission Control Centre (THMCC) is located at the Department of Aviation in Bangkok. The THMCC controls two LEOLUTs.

The Thai LEOLUTs provide full capability processing, including G-SARP processing of the transponded SARR data and combined LEO/GEO processing, according to the relevant Cospas-Sarsat specifications. The local coverage area of the Thai LEOLUTs includes the Bay of Bengal, parts of the Indian Ocean, and the South China Sea, as well as the land area of South Asia, including all of Thailand and the Malaysian Peninsula.

The entire Thai Ground Segment is designed for 24 hours, seven days a week, operations.

2. SPOCs SUPPORTED

In its initial operational configuration, the Thai MCC will support the RCCs in Thailand.

3. SYSTEM INFORMATION MESSAGES

The THMCC will receive and process the following System information messages:

Orbit Vectors
SARP Calibration Data
SARR Calibration data
System Status
Narrative

The THMCC is capable of originating the following system information messages:

System Status
Narrative

These messages will normally be received from, or sent to, the designated nodal MCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

In the event the THMCC becomes unserviceable, the SIMCC will provide backup support to the THMCC. All alerts for the THMCC service area will be transmitted in SIT 185 format and to a Fax number nominated by THMCC or via AFTN. The THMCC will ensure distribution to the RCCs and SPOCs it supports.

The local coverage area of the Thai LEOLUTs overlaps with the coverage area of LEOLUTs operated by Hong Kong, China, India, Indonesia, Singapore, and ITDC. In the fringe coverage areas, there is also some overlap with LUTs operated by China (P. R. of), Japan, Korea, Pakistan, and the USA (Guam).

5. OTHER INFORMATION

None.

- END OF THIS SECTION -

II / B.TR TRMCC - TURKEY MISSION CONTROL CENTRE

1. GENERAL

The Turkey Mission Control Centre is located at the Main SAR Coordination Centre (MSRCC) building (G.M.K. Bulvari No: 128/A, 06570 Maltepe, Ankara). Two LEOLUTs and one GEOLUT are installed at the Ankara Esenboga Airport.

LUTs are located at the following co-ordinates:

	Latitude	Longitude
LEOLUT (1)	40° 08.45' N	032° 59.38' E
LEOLUT (2)	40° 08.44' N	032° 59.38' E
GEOLUT	40° 08.42' N	032°59.40'E

Turkey LEOLUTs can localise transmitters and distress beacons in local mode and global mode.

The TRMCC and LEOLUTs operate 24 hours a day throughout the year.

The communication interfaces used by TRMCC are as follows:

AFTN FTP-VPN X.25 Facsimile Voice

2. SPOCs SUPPORTED

The TRMCC provides primary support to the Turkey RCCs and routes alert and notification (NOCR) messages to other countries and can receive these messages from them. The TRMCC distributes alert data for the following SPOCs: Afghanistan, Iran and Iraq.

3. SYSTEM INFORMATION MESSAGES

The TRMCC originates and receives the following System information messages:

Orbit vectors:	receive from FMCC;
SARP calibration:	receive from FMCC;
System status:	originate to and receive from FMCC;
Narrative:	received and originated as required.

4. BACK-UP PROCEDURES AND AGREEMENTS

TRMCC operates two Operational Control Consoles (OCC), one of them being a back-up. In the event of failure of both TRMCC OCCs, Turkey has back-up agreements and procedures in place with Italy. The following procedures have been agreed to:

a) Whenever the back-up service is required, TRMCC notifies ITMCC by means of Fax, Telephone or Email,

b) ITMCC notifies TRMCC when the back-up service commences by Fax, Telephone or Email,

c) ITMCC sends a SIT 605 message notifying the other MCCs of the TRMCC failure, and that ITMCC is performing back-up service according to section 3.7, document C/S A.001,

d) TRMCC advises the Turkish RCCs and SPOCs about the TRMCC failure and the back-up procedures,

e) ITMCC transmits alerts for the Turkish service area in SIT 185 format to:

- TRMCC using the Turkish MSRCC Telex (primary communication link) or via Fax, and
- TRMCC SPOCs using SPOCs communication links mentioned in item (l) below,

f) In the event that ITMCC is unable to communicate with TRMCC and/or TRMCC SPOCs as described above, ITMCC shall transmit alerts for the Turkish service area in SIT 185 format to MSRCC/Ankara via land Telex, Inmarsat C Telex or Fax. In this case, ITMCC will advise MSRCC/Ankara of their inability to communicate with TRMCC and/or the TRMCC SPOCs. Other Turkish RCCs and SPOCs as well as TRMCC will be advised by MSRCC/Ankara,

g) TRMCC will notify ITMCC as soon as the problem is solved, and will advise the time when TRMCC plans to restore normal operations,

h) When TRMCC returns to normal operations it will send a SIT 605 message notifying ITMCC and other MCCs that TRMCC has resumed normal operations. TRMCC will also notify its RCCs and SPOCs that it has resumed normal operations,

i) ITMCC will send all requested missing messages to TRMCC,

j) ITMCC shall contact TRMCC by means of:

Tel : +90.312.2313374
Fax : +90.312.2312902
E-mail : trmcc@denizcilik.gov.tr
AFTN : LTACZSZX

k) ITMCC shall contact MSRCC/Ankara by means of:

Tel : +90.312.2319105 / 2324783
Fax : +90.312.2320823
Tlx : +60744144
Email : trmrcc@denizcilik.gov.tr
Inm-C : 427122324

l) ITMCC shall contact the TRMCC SPOCs by means of:

- Iran (Tehran RCC)
  Tel: +98.214.4544107 / 4544116
  Fax: +98.214.4544114 / 4544117
  AFTN: OIIIZRZX
- Iraq & Afghanistan (Qatar JPRC)
  Tel: +974.4589555 / 4364215
  Email: jprc.chief1@auab.afcent.af.mil

m) TRMCC shall contact ITMCC by means of:

Tel : +39 080 5341053 – 5341571 - 5344033
Fax : +39 080 5342145
Tlx : +811375
Email : itmccoperator@cospas-sarsat-italy.it

5. OTHER INFORMATION

A register of beacons is maintained at the TRMCC.

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II / B.UK UKMCC - UNITED KINGDOM MISSION CONTROL CENTRE

1. GENERAL

The United Kingdom Mission Control Centre is co-located with the ARCC at Kinloss, Scotland and controls one LEOLUT and one GEOLUT located at Combe Martin (see Annex II /A). The UKMCC has a hot back-up MCC, also located at Kinloss. The UKMCC is manned 24 hours per day throughout the year, including public holidays.

The UK LEOLUT operates in the global mode and provides local mode coverage of Europe, the Eastern half of the North Atlantic Ocean and part of Southern Scandinavia. Alert data from the UK LEOLUT and GEOLUT is transmitted to the UKMCC via two 64 kb Kilostream Assured Restore lines with automatic 64 kb ISDN back-up, one line feeding the Primary MCC and one the back-up MCC. The UKMCC uses FTP-VPN, X.25, AFTN, Fax, point-to-point data-link and voice Telephone to distribute data to MCCs and RCCs.

2. SPOCs SUPPORTED

The UKMCC provides alert data to United Kingdom and Republic of Ireland MRCCs and ARCCs.

The UKMCC also provides alert and Notification of Beacon Registration (NOCR) messages to MCCs within the Central Data Distribution Region and has a bilateral arrangement with the CMCC for the direct exchange of alert and NOCR data. Alert messages for areas outside the Central DDR are routed to the FMCC. NOCR messages are routed in accordance with Figure III / A.8 of document C/S A.001.

The communications interfaces used by UKMCC are:

UK ARCC:	Data-link	Fax	Voice		
UK MRCCs:	Fax	Voice			
Irish MRCC:	AFTN	Fax	Voice		
FMCC:	FTP-VPN	AFTN	Fax	Voice	
ITMCC:	AFTN	X.25	Fax	Voice	
NMCC:	AFTN	Fax	Voice	FTP-VPN	
CMCC:	AFTN	Fax	Voice	FTP-VPN	
TRMCC:	AFTN	X.25	FTP-VPN	Fax	Voice

3. SYSTEM INFORMATION MESSAGES

The following System information messages are received/originated at UKMCC:

Orbit vectors:	received from FMCC;
SARP calibration:	received from FMCC;
System status:	received and originated as required;
Narrative:	received and originated as required;
406 MHz SARR frequency calibration:	receive from CMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

The Combe Martin LEOLUT has overlapping local mode coverage areas to a greater or lesser extent with the following LEOLUTs: Bari, Maspalomas, Ouargla, Spitsbergen, Tromsoe and Toulouse. It is therefore feasible for one to back up the other in the case of failure or planned maintenance downtime.

Co-operation in the coverage of individual satellites passes may also be feasible, but requires further study.

LEOLUT operators will forward a written notice of intention to perform maintenance routines involving deactivation of LEOLUT well in advance. The MCC will inform all other MCCs as soon as a decision has been taken, and confirm the times a minimum of two weeks prior to deactivation.

The LEOLUT operator will inform the associated MCC by the quickest possible means, followed by a written confirmation when an estimate of the duration of the downtime is available. The MCC will immediately inform the other MCCs.

The UKMCC has a back-up facility also located at Kinloss but, in the case of complete failure of the UKMCC, the NMCC will assume the duties of the UKMCC. The NMCC will send validated Cospas-Sarsat alert data, within the UKMCC service area to designated SPOCs or RCCs. In the UK SRRs this will be MRCC Falmouth, and for Eire this will be MRCC Dublin.

The UKMCC provides back-up facilities for the NMCC.

5. OTHER INFORMATION

An ELT register of UK serial-coded beacons is maintained at UKMCC.

A register of UK EPIRB beacons is maintained at MRCC Falmouth.

- END OF THIS SECTION -

II / B.US USMCC - UNITED STATES MISSION CONTROL CENTRE

1. GENERAL

The United States Mission Control Centre is located at the National Oceanic and Atmospheric Administration, Suitland, Maryland. The USMCC controls dual LEOLUTs at the following locations (see Annex II / A):

Fairbanks, Alaska
Vandenberg AFB, California
Wahiawai, Hawaii
Suitland, Maryland (LEOSAR Support Equipment (LSE))
Andersen AFB, Guam
Miami, Florida.

The LEOLUTs provide coverage of the U.S. SRRs from mid-Atlantic to the western-Pacific, and from the North Pole south to approximately 15 degrees south. Operations are 24 hours per day, seven days a week. When available, the OSE, and LSE are used operationally. The LSE is also used for LEOLUT system development and testing. The OSE is air transportable and can be set up at any location as required.

The USMCC also controls two operational GEOLUTs (MD1and MD2) which are located in Suitland, MD. A third GEOLUT, the GEOSAR Support Equipment (GSE), is used for GEOLUT system development and testing but can also be used operationally, when available (see Annex II / A).

The USMCC uses a dedicated frame relay network for communications with its LUTs and the majority of its RCCS. AFTN and FTP-VPN are used for communication with other MCCs. AFTN and Fax are used for communication with the USMCC SPOCs.

The USMCC also assumes the nodal responsibilities for the Western DDR as defined at Annex III / A of this document.

The National Oceanic and Atmospheric Administration is the lead agency in the United States for the Cospas-Sarsat Programme.

2. SPOCs SUPPORTED

In support of the United States National Search and Rescue Plan, the USMCC provides alert data to U.S. Coast Guard and Air Force Rescue Co-ordination Centres. In accordance with document C/S A.001, the USMCC also exchanges alert and notification (NOCR) messages with other MCCs. The USMCC distributes alert data for the following SPOCs:

CARIBBEAN:

Aruba	Cuba	Jamaica
Bahamas	Curacao	Mexico
Barbados	Dominican Republic	Nicaragua
Belize	El Salvador	Panama
Bonaire	Grenada	Puerto Rico
British Virgin Island	Guatemala	St. Vincent and the Grenadines
Cayman Islands	Haiti	Trinidad and Tobago
Costa Rica	Honduras	Turks and Caicos Island

SOUTH AMERICA:

Colombia	Guyana
Ecuador	Venezuela

ATLANTIC:	PACIFIC:	
Bermuda	Marshall Islands	Northern Mariana Islands
	Micronesia	Palau

3. SYSTEM INFORMATION MESSAGES

The USMCC originates and receives the following System Information messages:

SARR command verification:	to the CMCC;
SARP command verification:	to the FMCC;
SARR command:	from the CMCC;
SARP command:	from the FMCC;
System status:	originate and receive;
Narrative:	originate and receive;
Orbit vectors:	originate and receive;
SARP calibration:	originate and receive;
406 MHz SARR frequency calibration:	originate and receive.

4. BACK-UP PROCEDURES AND AGREEMENTS

In the unlikely event of a USMCC failure, the USA has backup agreements and procedures in place with Australia and Canada. Australia provides backup for nodal MCC responsibilities and Canada and Australia together provide backup for other MCC alert data intended for U.S. RCCs and SPOCs. Accordingly, the USMCC has designated separate communications paths and procedures for RCCs and SPOCs. The USA has also installed an alternate system at a site in Lanham, MD. The backup procedures will be used during the period of time required to transition from the USMCC in Suitland, MD to the alternate site in Lanham, MD or if the USMCC in Suitland and the alternate site in Lanham experience a simultaneous outage such as may occur during a regional power outage.

The USMCC has provided Australia and Canada with Geosort data for its national RCCs and SPOCs. In the event of a USMCC outage that lasts or is expected to last more than 30 minutes, but less than one (1) hour, the CMCC will support the USMCC by sending, alert data directly to the U.S. RCCs. In the event of a USMCC outage that lasts or is expected to last more than 1 hour, the AUMCC will assume nodal responsibilities for the Western DDR, send alerts for the U.S. SRR to the CMCC, and Fax alerts for the U.S. SPOCs to the USMCC. The CMCC will provide support by sending alerts directly to the U.S. RCCs.

The USMCC does not have the capability to reroute or redirect traffic to another MCC.

5. OTHER INFORMATION

406 MHz EPIRBs / ELTs have been approved for carriage on U.S. vessels and aircraft. A beacon register for USA beacons is maintained at the USMCC.

- END OF THIS SECTION -

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II / B.VN VNMCC - VIETNAM MISSION CONTROL CENTRE

1. GENERAL

The Vietnam Mission Control Centre is located at the Vietnam Maritime Communication and Electronics Company in Haiphong. The VNMCC controls one LEOLUT.

The Vietnam LEOLUT provides full processing, including G-SARP processing of the transponded SARR data, according to the relevant Cospas-Sarsat specifications. The local coverage area of the Vietnam LEOLUT includes the Bay of Bengal, parts of the Indian Ocean, and the South China Sea, as well as the land area of South Asia, including all of Vietnam.

The entire Vietnam ground segment is designed for 24 hours, seven days a week, operations.

2. SPOCs SUPPORTED:

Cambodia Vietnam
Laos

The communication interfaces used by the VNMCC are:

FTP-VPN AFTN Facsimile Voice

3. SYSTEM INFORMATION MESSAGES

The VNMCC receives and processes the following System information messages:

Orbit vectors: receive from JAMCC;
SARP calibration data: receive from JAMCC;
System status: originating to and receive from JAMCC.

The VNMCC is capable of originating the following System information messages:

System Status
Narrative

These messages are normally received from, or sent to JAMCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

In the event the VNMCC cannot provide its service, the HKMCC will provide back-up to the VNMCC. All alerts in the VNMCC service area will be sent in SIT 185 format to designated RCCs/SPOCs via FTP-VPN, AFTN or Fax.

The local coverage area of the Vietnam LEOLUT overlaps with the LEOLUTs operated by Hong Kong, India, Indonesia, ITDC, Singapore, and Thailand. In the fringe coverage areas, there is also some overlap with LUTs operated by China, Japan, Korea, Pakistan, and the United States (Guam).

5. OTHER INFORMATION

None.

- END OF THIS SECTION -

II / B.VZ VZMCC – VENEZUELA MISSION CONTROL CENTRE
(under development)

1. GENERAL

The Venezuelan Mission Control Centre (VZMCC) is located in Maiquetia, Venezuela. The VZMCC is installed within the Air Traffic Control Building at the Maiquetia Airport with Venezuela LEOLUT 1 and GEOLUT. Venezuela LEOLUT 2 is installed in the BASE SAR building and within 2 kilometers from the VZMCC. These LUT are located at the following locations:

	Latitude	Longitude
LEOLUT 1	10° 35.88' N	66° 58.92' W
LEOLUT 2	10 ° 35.94' N	66 ° 59.10' W
GEOLUT	10° 35.88' N	66° 58.92' W

The Venezuelan LEOLUTs have the capability to provide local and global coverage. The GEOLUT also provides data alerts from beacons within the GOES-12 coverage area.

The Venezuelan MCC, LEOLUTs and GEOLUT operate 24 hours a day, seven days a week throughout the year.

The Instituto Nacional de Aeronáutica Civil (INAC) is the lead agency in Venezuela for the Cospas-Sarsat Programme.

2. SPOCs SUPPORTED

The Venezuelan MCC is in initial operational configuration, when at IOC it will support RCCs in Venezuela.

3. SYSTEM INFORMATION MESSAGES

The VZMCC will receive and process the following System information messages:

Orbit Vectors
SARP Calibration Data
SARR Calibration Data
System Status
Narrative

The VZMCC is capable of originating the following System information messages:

System Status
Narrative

These messages will normally be received from, or sent to the designated nodal MCC.

4. BACK-UP PROCEDURES AND AGREEMENTS

None.

5. OTHER INFORMATION

None.

- END OF THIS SECTION -

- END OF ANNEX II / B -

ANNEX II / C

SID IMPLEMENTATION STATUS

Document C/S A.002 "Cospas-Sarsat Mission Control Centres Standard Interface Description", approved by the Council, contains standardised message formats, identified by "Subject Identifier Type" (SIT) codes, which may be used by MCCs.

The tables shown below indicate which SITs for System information messages and alert and narrative messages have been implemented by the various MCCs.

They also indicate whether the capability is receive, originate, both receive and originate, or not implemented. After each MCC has added the capability to use any of these messages, it shall notify other MCCs in accordance with section 1.4.

SYSTEM INFORMATION MESSAGES

as at: 27 October 2011

MCC Name	SIT NUMBER													
	215	216	415	416	417	425	435	445	510	515	525	535	545	605
AEMCC	R	R	R	-	R	-	-	-	-	-	-	-	-	B
ALMCC	R	R	R	-	R	-	-	-	-	-	-	-	-	B
ARMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
ASMCC	R	R	R	-	R	-	-	-	-	-	-	-	-	B
AUMCC	B	B	B	-	B	-	-	-	B	-	-	-	-	B
BRMCC	R		R	-	R	-	-	-	R	-	-	-	-	B
CHMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
CMC	B		R	-	TBD	-	-	-	-	-	-	-	-	B
CMCC	R	R	R	-	TBD	-	-	-	B	R	R	O	R	B
CNMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
FMCC	B	B	B	B	B	R	O	R	-	-	-	-	-	B
GRMCC	R	R	R	-	R	-	-	-	-	-	-	-	-	B
HKMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
IDMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	R
INMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
ITMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
JAMCC	R	R	R	-	R	-	-	-	-	-	-	-	-	B
KOMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
NIMCC	R	R	R	-	R	-	-	-	-	-	-	-	-	B
NMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
PAMCC	R	R	R	-	R	-	-	-	-	-	-	-	-	B
PEMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
SAMCC	R	R	R	-	R	-	-	-	-	-	-	-	-	B
SIMCC	R		R	-	R	-	-	-	-	-	-	-	-	R
SPMCC	R	R	R	-	R	-	-	-	-	-	-	-	-	B
TAMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
THMCC	R		R	-	TBD	-	-	-	-	-	-	-	-	B
TRMCC	R	R	R	-	R	-	-	-	R	-	-	-	-	B
UKMCC	R		R	-	TBD	-	-	-	R	-	-	-	-	B
USMCC	B	O	R	O	B	O	R	O	B	O	O	R	O	B
VNMCC	R	R	R	-	R	-	-	-	-	-	-	-	-	B

Legend:

O	originate
B	both originate and receive
R	receive
-	not implemented
TBD	to be determined

ALERT & NARRATIVE MESSAGES

as at: 27 October 2011

MCC Name	SIT Number											
	121	122	123	124	125	126	127	132	133	185	915	925
AEMCC	B	B	B	B	B	B	B	B	B	B	B	B
ALMCC	B	B	B	B	B	B	B	B	B	B	B	B
ARMCC	B	B	B	B	B	B	B	B	B	B	B	B
ASMCC	B	B	B	B	B	B	B	B	B	B	B	B
AUMCC	B	B	B	B	B	B	B	B	B	B	B	B
BRMCC	B	B	B	B	B	B	B	B	B	B	B	B
CHMCC	B	B	B	B	B	B	B	B	B	B	B	B
CMC	B	B	B	B	B	B	B	B	B	B	B	-
CMCC	B	B	B	B	B	B	B	B	B	B	B	B
CNMCC	B	B	B	B	B	B	B	B	B	B	B	R
FMCC	-	B	B	B	B	B	B	B	B	B	B	B
GRMCC	B	B	B	B	B	B	B	B	B	B	B	B
HKMCC	B	B	B	B	B	B	B	B	B	B	B	B
IDMCC	B	B	B	B	B	B	B	B	B	O	B	B
INMCC	B	B	B	B	B	B	B	B	B	B	B	B
ITMCC	B	B	B	B	B	B	B	B	B	B	B	TBD
JAMCC	B	B	B	B	B	B	B	B	B	B	B	B
KOMCC	B	B	B	B	B	B	B	B	B	B	B	B
NIMCC	B	B	B	B	B	B	B	B	B	B	B	B
NMCC	B	B	B	B	B	B	B	B	B	B	B	B
PAMCC	B	B	B	B	B	B	B	B	R	O	B	B
PEMCC	B	B	B	B	B	B	B	B	B	B	B	B
SAMCC	B	B	B	B	B	B	B	B	B	B	B	B
SIMCC	B	B	B	B	B	B	B	B	B	B	B	B
SPMCC	B	B	B	B	B	B	B	B	B	B	B	B
TAMCC	B	B	B	B	B	B	B	B	B	B	B	B
THMCC	B	B	B	B	B	B	B	B	B	B	B	B
TRMCC	B	B	B	B	B	B	B	B	B	B	B	B
UKMCC	R	B	B	B	B	B	B	B	B	B	B	B
USMCC	B	B	B	B	B	B	B	B	B	O	B	B
VNMCC	B	B	B	B	B	B	B	B	B	B	B	B

Legend: O originate
R receive
B both originate and receive
- not implemented
TBD to be determined

- END OF ANNEX II / C -

ANNEX II / D

STATUS OF SPACE SEGMENT

This Annex provides the current status of Cospas-Sarsat Space Segment payloads.

Table II / D.1 contains information on the operational status of the Cospas-Sarsat SAR payloads.

Tables II / D.2 and II / D.3 contain the current status of LEOSAR and GEOSAR payloads.

Each satellite platform provider will commission new satellite payloads according to the procedures documented in document C/S T.004. The results will be provided to the Secretariat who will update and distribute this Annex accordingly. Additionally, after a payload is declared operational, and whenever there is a change in the configuration or status of a satellite payload, the Space Segment Providers will notify all Ground Segment Operators and the Secretariat. The message format described in Figure II / D.1 will be used to provide this notification. In validating the satellite ID (per Table B.1 of C/S A.002), MCCs shall use the operational status of the satellite payload as provided by notification from the Space Segment Provider, as well as the spacecraft status contained in Table II / D.1.

The tables in this Annex attempt to describe the operational capabilities of the SAR payloads to Cospas-Sarsat Participants, therefore, no details on redundant systems on-board the satellite are provided. It is assumed that each platform provider will make the necessary configuration changes to provide for continued operation of the payload by switching to redundant systems where and when applicable. These changes do not have to be documented within Cospas-Sarsat.

```
/12345 00000/3660/97 123 1234
/605/5030
/TO:  ALL MCCS
FROM:  <MCC ASSOCIATED WITH SATELLITE OR PAYLOAD PROVIDER>
SUBJECT:   A) INITIAL OPERATIONAL CAPABILITY FOR <S/C> SAR PAYLOAD
           B) DECLARATION OF OPERATION FOR <S/C> SAR PAYLOAD
           C) CHANGE IN STATUS FOR <S/C> SAR PAYLOAD
           D) DECOMMISSIONING OF <S/C> SAR PAYLOAD

DATA CONSIDERED OPERATIONAL IN COSPAS-SARSAT (C/S A.001, TABLE II/D.1)
----------------------------------------------------------------------

   (L/G) 406 SARR: A) OPERATIONAL, B) NOT OPERATIONAL OR C) NOT APPLICABLE
   (L)   406 SARP (LOCAL): A) OPERATIONAL OR B) NOT OPERATIONAL
   (L)   406 SARP (GLOBAL): A) OPERATIONAL OR B) NOT OPERATIONAL
   (L)   PSEUDO MODE: A) OPERATIONAL, B) NOT OPERATIONAL OR C) NOT
         APPLICABLE

STATUS OF SAR PAYLOAD (C/S A.001, TABLE II/D.2)
-----------------------------------------------

   (L)   L-BAND DOWNLINK: A) NORMAL, B) DEGRADED OR C) UNUSABLE
   (L/G) 406 SARR: A) NORMAL, B) DEGRADED, C) UNUSABLE OR D) NOT APPLICABLE
   (L/G) 406 SARR GAIN CONTROL:  A) AUTOMATIC, B) FIXED OR C) NOT
         APPLICABLE
   (L)   406 SARP (LOCAL): A) NORMAL, B) DEGRADED OR C) UNUSABLE
   (L)   406 SARP (GLOBAL): A) NORMAL, B) DEGRADED OR C) UNUSABLE
   (L)   PSEUDO MODE: A) ENABLED, B) DISABLED OR C) NOT APPLICABLE
   (L/G) BANDWIDTH: A) 27 KHZ, B) 40 KHZ, C) 80 KHZ OR D) NOT APPLICABLE
   (G)   POSITION:
   (G)   DOWNLINK FREQUENCY/TYPE:

    (L)   SAR INSTRUMENTS ACTIVE DURING SATELLITE MANOEUVRE: A) YES, B) NO
          OR C) NOT APPLICABLE


COMMENTS
--------
QQQQ
/LASSIT
/ENDMSG
```


Notes: (L) - Applies to LEOSAR only.
(G) - Applies to GEOSAR only.
(L/G) - Applies to both LEOSAR and GEOSAR.

Figure II / D.1 : Standard Message for Reporting Satellite Payload Status

```
/12345 00000/3660/05 123 1412
/605/5030
/TO: ALL MCCS
FROM: <MCC RESPONSIBLE FOR THE SATELLITE MANOEUVRE >
SUBJECT: MANOEUVRE OF SATELLITE <XNN>

STATUS OF MANOEUVRE: <SCHEDULED, EXECUTED OR CANCELLED>
TYPE OF MANOEUVRE: <IN PLANE, OUT OF PLANE OR BOTH>
SAR INSTRUMENTS ACTIVE DURING MANOEUVRE: <YES OR NO>

MANOEUVRE START TIME: <DD MON YEAR HHMM> UTC
MANOEUVRE END TIME: <DD MON YEAR HHMM> UTC
[REPEAT INFORMATION ABOUT MANOEUVRE START AND END TIME AS NEEDED]

TIME NEW ORBIT VECTORS ARE EXPECTED: <DD MON YEAR HHMM> UTC

MAXIMUM EXPECTED CHANGE IN SATELLITE POSITION DUE TO THE SATELLITE
MANOEUVRE: <XX> KM AFTER <YY> HOURS
MAXIMUM EXPECTED ERROR IN DOPPLER LOCATION: <XX> KM AFTER <YY> HOURS

THIS DOPPLER LOCATION ERROR INCLUDES A NOMINAL SYSTEM ERROR OF 5 KM.

COMMENTS -  MCCS SHOULD <EXECUTE OR REFER TO> PROCEDURES ON SATELLITE
MANOEUVRES CONTAINED IN SECTION 3.6.5 OF C/S A.001.

QQQQ
/LASSIT
/ENDMSG
```

Figure II / D.2 : Standard Message for Reporting Satellite Manoeuvres

Table II / D.1 : Operational Status of the Cospas-Sarsat SAR Payloads

as at: 27 October 2011

Satellite (Launch Date)	Code	406 MHz SARR	406 MHz SARP			Comments			
			Global Mode	Local Mode	Message Format	Pseudo Mode	Altitude (km)	Equator Crossing Time	Other
Sarsat-7 (1998)	007	Operational	Operational	Operational	Long	Disabled	810	1641	
Sarsat-8 (2000)	008	Operational	Operational	Operational	Long	Disabled	853	1825	
Sarsat-9 (2002)	009	Operational	Operational	Operational	Long	Disabled	823	2104	
Sarsat-10 (2005)	010	Operational	Operational	Operational	Long	Disabled	854	1352	
Sarsat-11 (2006)	011	Operational	Operational	Operational	Long	Disabled	820	2131	SARP-3 instrument has an intermittent software issue that causes a memory reset approximately every 10 days
Sarsat-12 (2009)	012	Operational	Operational	Operational	Long	Disabled	856	1343	
GEOSAR System									
						Comments			
GOES-11 (2000)	211	Operational	NA			Operational GOES-West satellite			
GOES-12 (2001)	212	In-orbit spare				Moved to position 60° W in June 2010			
GOES-13 (2006)	213	Operational				Replaced GOES-12 as the operational GOES-East satellite at 75° W on 26 April 2010			
GOES-14 (2009)	214	In-orbit spare				In-orbit spare. In storage at 105° W as of December 2009			
GOES-15 (2009)	215	UT				Launched on 4 March 2010, under test at 89.5°W and expected to be at 105°W in December 2011			
INSAT-3A (2003)	243	Operational							
MSG-1 (2002)	261	Operational							
MSG-2 (2005)	262	Operational							
Electro-L No.1 (2011)	221	UT				Launched on 20 January 2011, under test from 20 February at 76° E			

Notes: NA Not available. UT Under test.

Table II / D.2 : LEOSAR Satellite Payloads

as at: 27 October 2011

Satellite	L-band Down-link	406 MHz SARR Status	406 MHz SARP Status				Comments
			Global Mode	Local Mode	Band-width	Pseudo Mode	
Sarsat-7	F	F	F	F	40 kHz	Disabled	
Sarsat-8	F	F	F	F	40 kHz	Disabled	
Sarsat-9	F	F	F	F	40 kHz	Disabled	
Sarsat-10	F	F	F	F	40 kHz	Disabled	
Sarsat-11	F	F	F	F	80 kHz	Disabled	The SARP-3 instrument has an intermittent software issue which causes a memory reset approximately every 10 days
Sarsat-12	F	F	F	F	80 kHz	Disabled	

Note: F Full operational status.

Table II / D.3 : GEOSAR Satellite Payloads

as at: 27 October 2011

Satellite	Position	Downlink			406 MHz Transponder			Comments
		Status	Frequency	Type	Status	Bandwidth	Gain Control	
GOES-11	135° W	F	1544.5 MHz	Broad	F	406.010 MHz-406.090 MHz	AGC	Operational GOES-West satellite
GOES-12	60° W	F	1544.5 MHz	Broad	F	406.010 MHz-406.090 MHz	AGC	In-orbit spare. Moved to position 60° W in June 2010
GOES-13	75° W	F	1544.5 MHz	Broad	F	406.010 MHz-406.090 MHz	AGC	Replaced GOES-12 as the operational GOES-East satellite at 75° W on 26 April 2010
GOES-14	105° W	In-orbit spare	1544.5 MHz	Broad	Standby	406.010 MHz-406.090 MHz	AGC	In-orbit spare, in storage at 105° W as of December 2009
GOES-15	89.5° W	UT	1544.5 MHz	Broad	UT	406.010 MHz-406.090 MHz	AGC	Launched on 4 March 2010, under test at 89.°W and expected to be at 105°W in December 2011
INSAT-3A	93.5° E	F	4505.695549 MHz	Narrow	F	406.010 MHz-406.090 MHz	TBD	
MSG-1	9.5° E	F	1544.5 MHz	Broad	F	406.010 MHz-406.090 MHz	Fixed	Operational
MSG-2	0°	F	1544.5 MHz	Broad	F	406.010 MHz-406.090 MHz	Fixed	Operational
Electro-L No.1	76° E	UT	1544.5 MHz	Broad	UT	406.010 MHz-406.090 MHz	Fixed	Launched on 20 January 2011, under test from 20 February at 76° E

Notes:
AGC Automatic gain control.
F Full operational status.
TBD To be determined.
UT Under test.

- END OF ANNEX II / D -

C/S A.001 ANNEXES

PART III:

OPERATIONAL PROCEDURES FOR COSPAS-SARSAT MCCs

ANNEX III / A

DATA DISTRIBUTION REGIONS AND INTER-MCC DATA EXCHANGE

III / A.1 INTRODUCTION

This annex describes the inter-DDR arrangements for data exchange and includes the particular regional arrangements or agreements that affect MCCs within a DDR. It may be amended by the MCCs involved. However, other MCCs should be notified of any changes in the event that the changes impact MCCs outside the region. If so, agreement of the Joint Committee is needed prior to implementation.

These procedures and arrangements become effective for MCCs under development (see section II / B.1) only after confirmation by the appropriate host MCC that the MCC under development has achieved Initial Operational Capability (IOC).

III / A.2 DEFINITION OF DDR

A data distribution region (DDR) is a region comprising two or more MCC service areas. Cospas-Sarsat alert data and System information are exchanged between DDRs through an MCC in each DDR which is the single point of contact for that DDR. This MCC is identified as the nodal MCC of the DDR.

III / A.3 DATA EXCHANGE BETWEEN DDRs

The inter-nodal network diagram is provided as Figure III / A.1.

The nodes of the MCC communication network and the associated DDRs are identified as follows:

Australia:	AUMCC – South West Pacific DDR	AU
France:	FMCC - Central DDR	FR
Japan:	JAMCC – North West Pacific DDR	JA
Russia:	CMC - Eastern DDR	RU
Spain:	SPMCC - South Central DDR	SP
USA:	USMCC - Western DDR	US

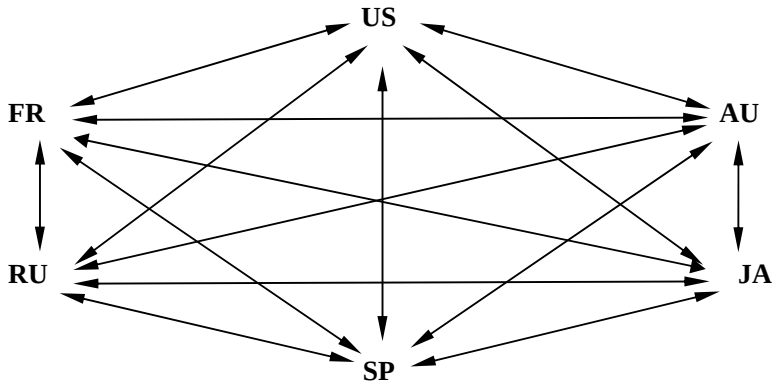


Figure III / A.1 : Inter-Nodal Network Diagram

III / A.4 DATA EXCHANGE WITHIN DDRs

III / A.4.1 Western DDR

The USMCC, as a nodal MCC, has accepted responsibility for passing alert information in this region and for the filtering of global mode alert or NOCR messages. Specific SRRs are outlined in Annex II / C.

Data flow in Western DDR (ARMCC, BRMCC, CHMCC, CMCC, PEMCC, and USMCC is described in Figure III / A.2.

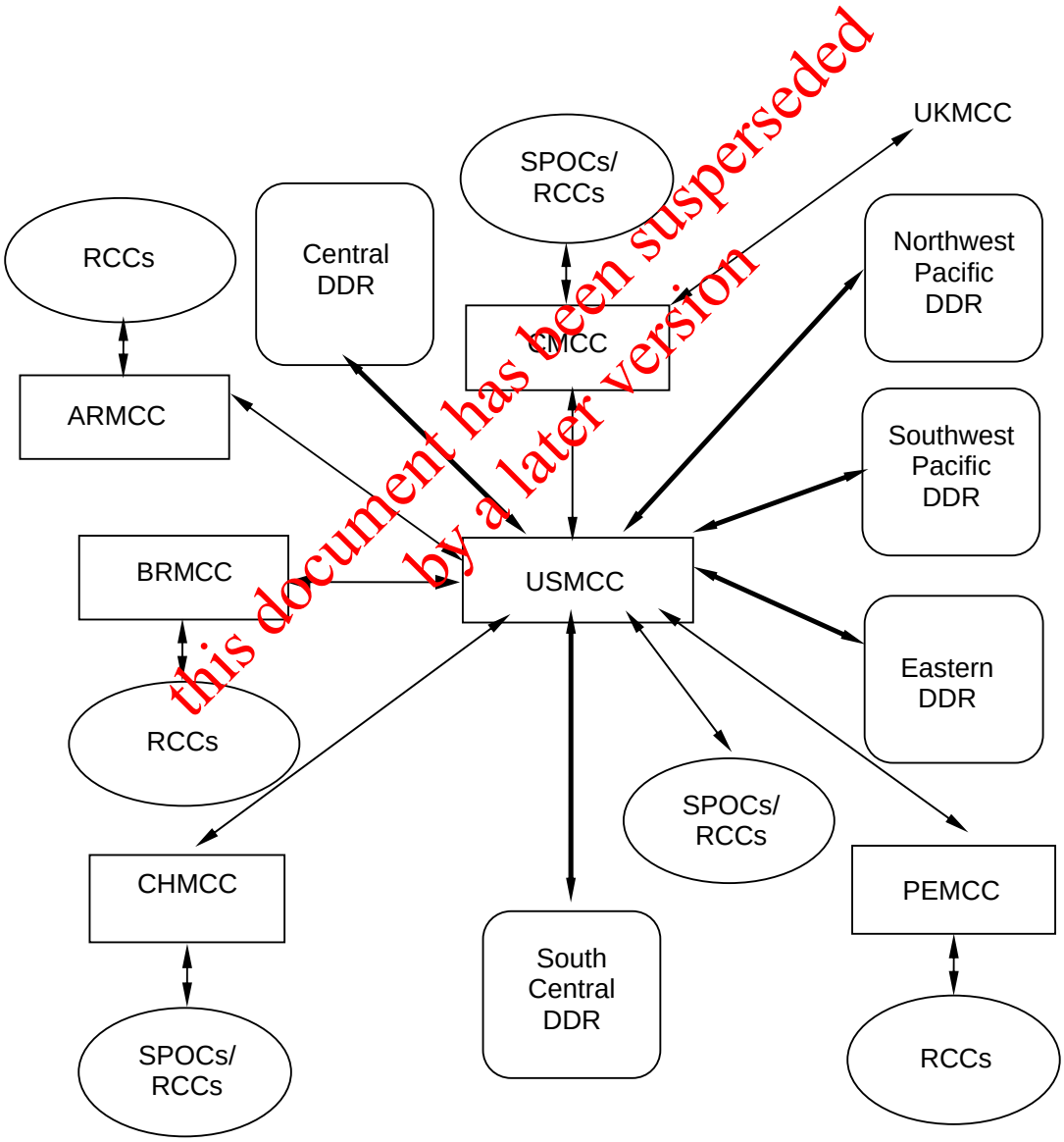


Figure III / A.2 : Western DDR Network Diagram

III / A.4.2 Central DDR

Data flow in Central DDR (FMCC, GRMCC, ITMCC, NMCC, TRMCC and UKMCC) is described in Figure III / A.3. Central DDR MCCs validate locations before forwarding them to the SAR organisations.

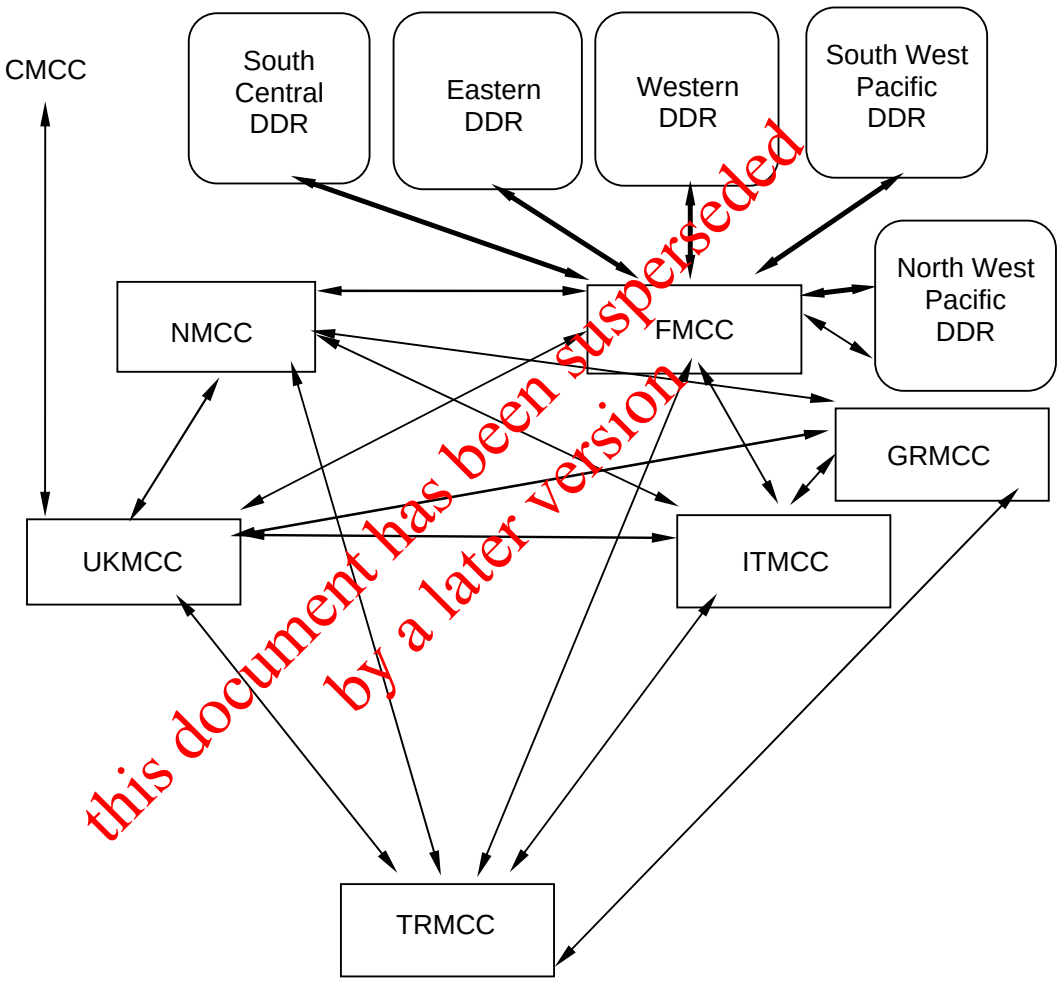


Figure III / A.3 : Central DDR Network Diagram

III / A.4.3 Eastern DDR

The CMC has no formal regional agreements.

Data flow in Eastern DDR (CMC, INMCC and PAMCC) is described in Figure III / A.4.

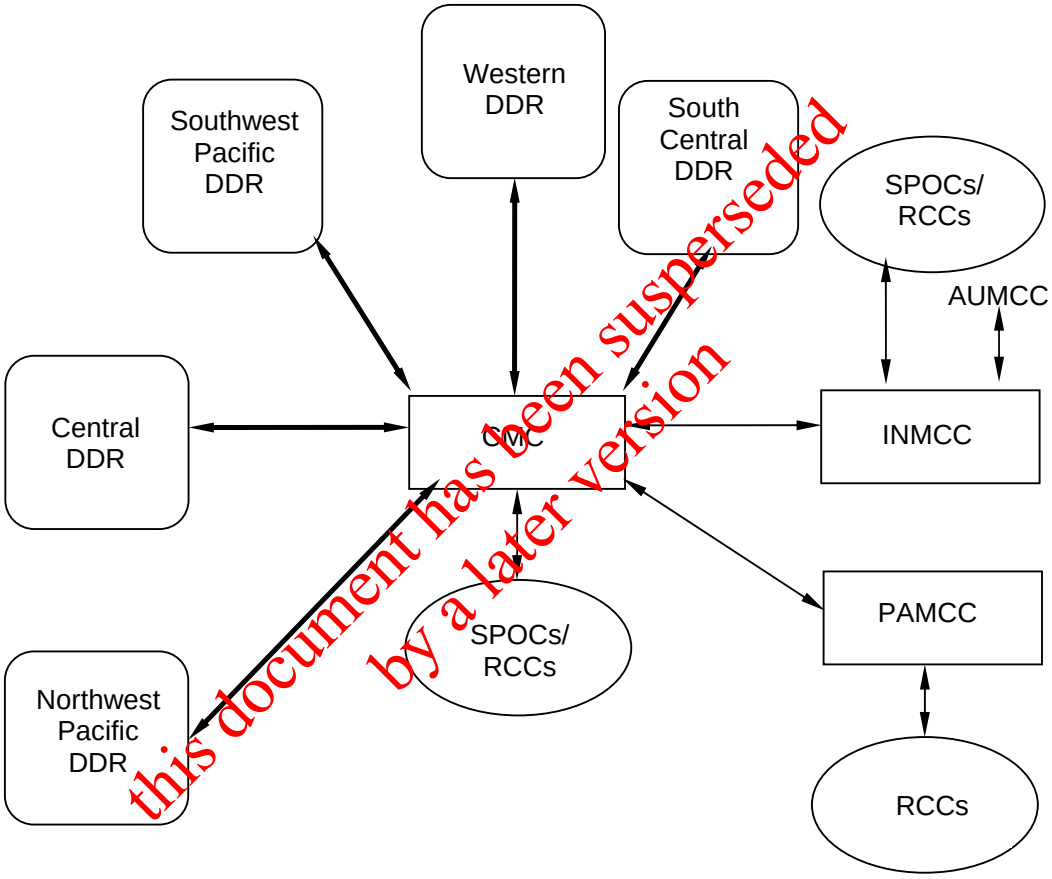


Figure III / A.4 : Eastern DDR Network Diagram

III / A.4.4 South West Pacific DDR

Data flow in South West Pacific DDR (ASMCC, AUMCC, IDMCC, SIMCC and THMCC) is described in Figure III / A.5.

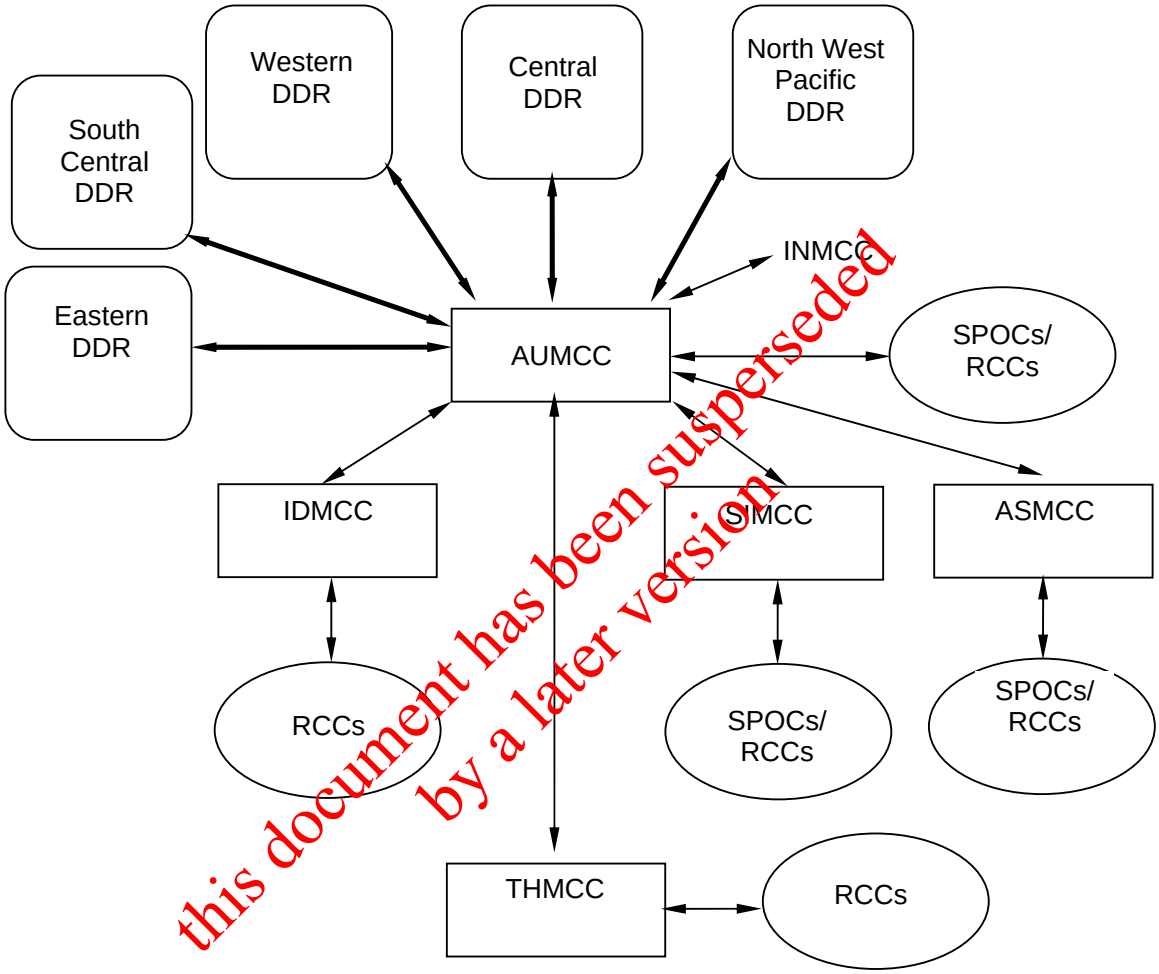


Figure III / A.5 : South West Pacific DDR Network Diagram

III / A.4.5 North West Pacific DDR

Data flow in North West Pacific DDR (CNMCC, HKMCC, JAMCC, KOMCC, TAMCC and VNMCC) is described in Figure III / A.6.

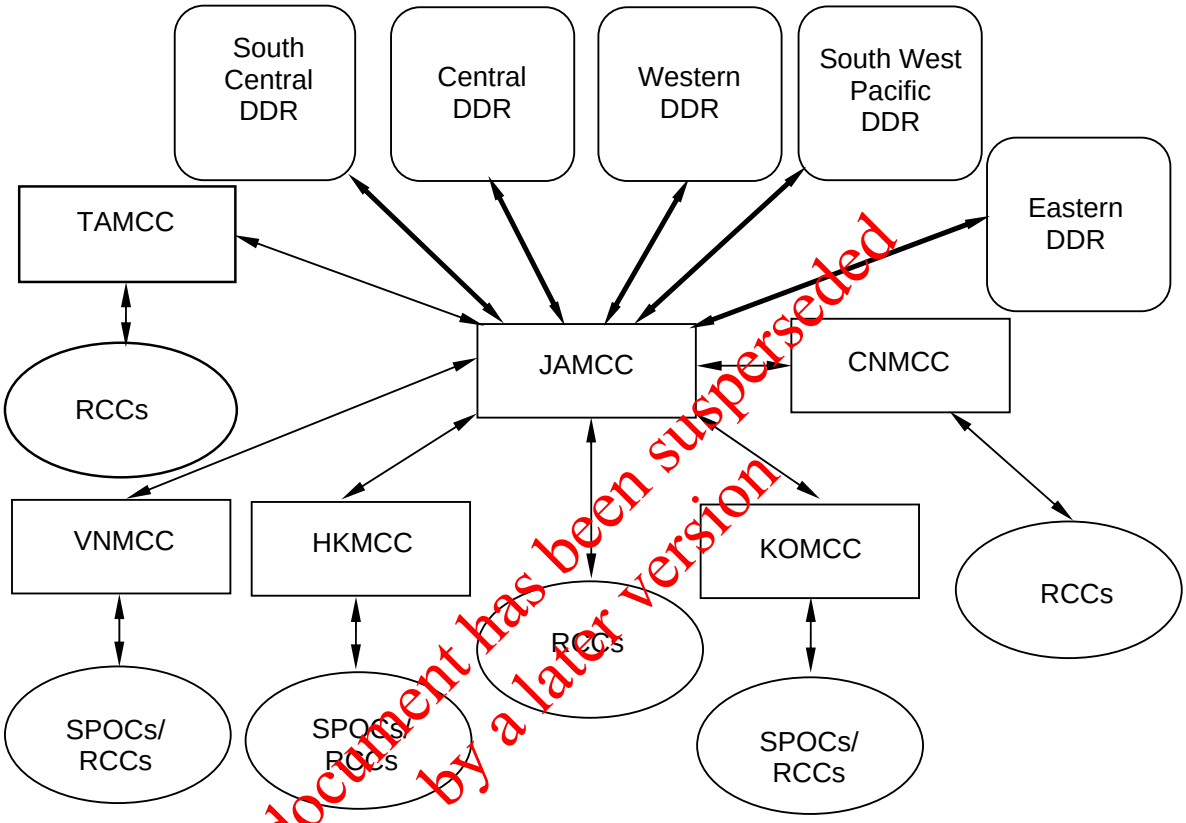


Figure III / A.6 : North West Pacific DDR Network Diagram

III / A.4.6 South Central DDR

Data flow in South Central DDR (AEMCC, ALMCC, NIMCC, SAMCC and SPMCC is described in Figure III / A.7.

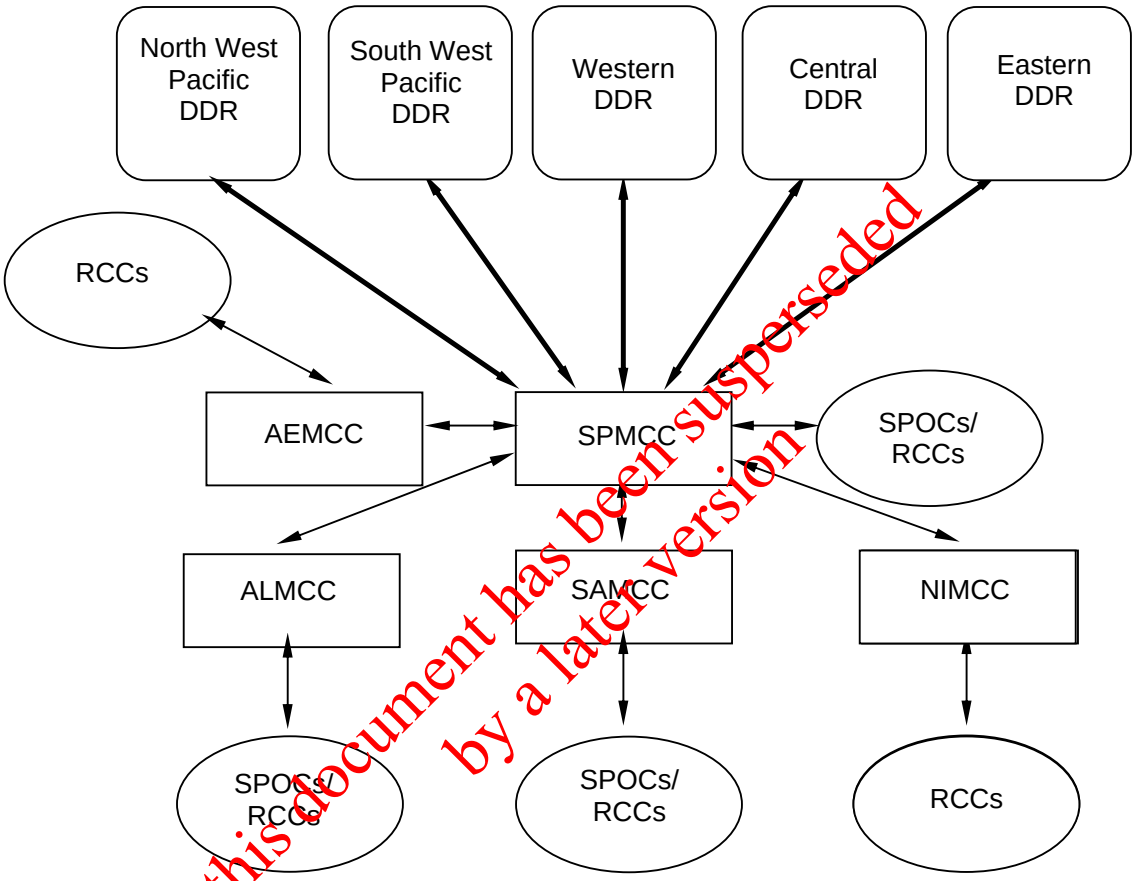


Figure III / A.7: South Central DDR Network Diagram

III / A.5 INTER-MCC ROUTING OF ALERT DATA

The receiving MCC shall route alert data to the MCC in which service area the alert is located (i.e., the destination MCC) as described in Figure III / A.8.

Location data provided by LEOLUT Doppler processing shall not be removed or altered by a distributing MCC.

III / A.6 INTER-MCC ROUTING OF SYSTEM INFORMATION

The routing of System information between MCCs is described in Figure III / A.9 “System Information Distribution”. MCCs shall route System information as described in Figure III / A.8.

Receiving MCC: / Destination MCC:	AEMCC	ALMCC	ARMCC	ASMCC	AUMCC	BRMCC	CHMCC	CMC	CMCC	CNMCC	FMCC	GRMCC	HKMCC	IDMCC
AEMCC	Nat.Pr.	SPMCC	USMCC	AUMCC	SPMCC	USMCC	USMCC	SPMCC	USMCC	JAMCC	SPMCC	FMCC	JAMCC	AUMCC
ALMCC	SPMCC	Nat. Pr.	USMCC	AUMCC	SPMCC	USMCC	USMCC	SPMCC	USMCC	JAMCC	SPMCC	FMCC	JAMCC	AUMCC
ARMCC	SPMCC	SPMCC	Nat. Pr.	AUMCC	USMCC	USMCC	USMCC	USMCC	USMCC	JAMCC	USMCC	FMCC	JAMCC	AUMCC
ASMCC	SPMCC	SPMCC	USMCC	Nat. Pr.	ASMCC	USMCC	USMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC	JAMCC	AUMCC
AUMCC	SPMCC	SPMCC	USMCC	AUMCC	Nat. Pr.	USMCC	USMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC	JAMCC	AUMCC
BRMCC	SPMCC	SPMCC	USMCC	AUMCC	USMCC	Nat. Pr.	USMCC	USMCC	USMCC	JAMCC	USMCC	FMCC	JAMCC	AUMCC
CHMCC	SPMCC	SPMCC	USMCC	AUMCC	USMCC	USMCC	Nat. Pr.	USMCC	USMCC	JAMCC	USMCC	FMCC	JAMCC	AUMCC
CMC	SPMCC	SPMCC	USMCC	AUMCC	CMC	USMCC	USMCC	Nat. Pr.	USMCC	JAMCC	CMC	FMCC	JAMCC	AUMCC
CMCC	SPMCC	SPMCC	USMCC	AUMCC	USMCC	USMCC	USMCC	USMCC	Nat. Pr.	JAMCC	USMCC	FMCC	JAMCC	AUMCC
CNMCC	SPMCC	SPMCC	USMCC	AUMCC	JAMCC	USMCC	USMCC	JAMCC	USMCC	Nat. Pr.	JAMCC	FMCC	JAMCC	AUMCC
FMCC	SPMCC	SPMCC	USMCC	AUMCC	FMCC	USMCC	USMCC	FMCC	USMCC	JAMCC	Nat. Pr.	FMCC	JAMCC	AUMCC
GRMCC	SPMCC	SPMCC	USMCC	AUMCC	FMCC	USMCC	USMCC	FMCC	USMCC	JAMCC	GRMCC	Nat. Pr.	JAMCC	AUMCC
HKMCC	SPMCC	SPMCC	USMCC	AUMCC	JAMCC	USMCC	USMCC	JAMCC	USMCC	JAMCC	JAMCC	FMCC	Nat. Pr.	AUMCC
IDMCC	SPMCC	SPMCC	USMCC	AUMCC	IDMCC	USMCC	USMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC	JAMCC	Nat. Pr.
INMCC	SPMCC	SPMCC	USMCC	AUMCC	INMCC	USMCC	USMCC	INMCC	USMCC	JAMCC	CMC	FMCC	JAMCC	AUMCC
ITMCC	SPMCC	SPMCC	USMCC	AUMCC	FMCC	USMCC	USMCC	FMCC	USMCC	JAMCC	ITMCC	ITMCC	JAMCC	AUMCC
JAMCC	SPMCC	SPMCC	USMCC	AUMCC	JAMCC	USMCC	USMCC	JAMCC	USMCC	JAMCC	JAMCC	FMCC	JAMCC	AUMCC
KOMCC	SPMCC	SPMCC	USMCC	AUMCC	JAMCC	USMCC	USMCC	JAMCC	USMCC	JAMCC	JAMCC	FMCC	JAMCC	AUMCC
NIMCC	SPMCC	SPMCC	USMCC	AUMCC	SPMCC	USMCC	USMCC	SPMCC	USMCC	JAMCC	SPMCC	FMCC	JAMCC	AUMCC
NMCC	SPMCC	SPMCC	USMCC	AUMCC	FMCC	USMCC	USMCC	FMCC	USMCC	JAMCC	NMCC	NMCC	JAMCC	AUMCC
PAMCC	SPMCC	SPMCC	USMCC	AUMCC	CMC	USMCC	USMCC	PAMCC	USMCC	JAMCC	CMC	FMCC	JAMCC	AUMCC
PEMCC	SPMCC	SPMCC	USMCC	AUMCC	USMCC	USMCC	USMCC	USMCC	USMCC	JAMCC	USMCC	FMCC	JAMCC	AUMCC
SAMCC	SPMCC	SPMCC	USMCC	AUMCC	SPMCC	USMCC	USMCC	SPMCC	USMCC	JAMCC	SPMCC	FMCC	JAMCC	AUMCC
SIMCC	SPMCC	SPMCC	USMCC	AUMCC	SIMCC	USMCC	USMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC	JAMCC	AUMCC
SPMCC	SPMCC	SPMCC	USMCC	AUMCC	SPMCC	USMCC	USMCC	SPMCC	USMCC	JAMCC	SPMCC	FMCC	JAMCC	AUMCC
TAMCC	SPMCC	SPMCC	USMCC	AUMCC	JAMCC	USMCC	USMCC	JAMCC	USMCC	JAMCC	JAMCC	FMCC	JAMCC	AUMCC
THMCC	SPMCC	SPMCC	USMCC	AUMCC	THMCC	USMCC	USMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC	JAMCC	AUMCC
TRMCC	SPMCC	SPMCC	USMCC	AUMCC	FMCC	USMCC	USMCC	FMCC	USMCC	JAMCC	TRMCC	TRMCC	JAMCC	AUMCC
UKMCC	SPMCC	SPMCC	USMCC	AUMCC	FMCC	USMCC	USMCC	FMCC	UKMCC	JAMCC	UKMCC	UKMCC	JAMCC	AUMCC
USMCC	SPMCC	SPMCC	USMCC	AUMCC	USMCC	USMCC	USMCC	USMCC	USMCC	JAMCC	USMCC	FMCC	JAMCC	AUMCC
VNMCC	SPMCC	SPMCC	USMCC	AUMCC	JAMCC	USMCC	USMCC	JAMCC	USMCC	JAMCC	JAMCC	FMCC	JAMCC	AUMCC

Figure III / A.8 : MCC Data Routing Matrix (1/2)

Note: Nat.Pr. - National Procedures.

Receiving MCC: / Destination MCC:	ITMCC	JAMCC	KOMCC	NIMCC	NMCC	PAMCC	PEMCC	SAMCC	SIMCC	SPMCC	TAMCC	THMCC	TRMCC	UKMCC	USMCC	VNMCC
AEMCC	FMCC	SPMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	AEMCC	JAMCC	AUMCC	FMCC	FMCC	SPMCC	JAMCC
ALMCC	FMCC	SPMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	ALMCC	JAMCC	AUMCC	FMCC	FMCC	SPMCC	JAMCC
ARMCC	FMCC	USMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC	FMCC	ARMCC	JAMCC
ASMCC	FMCC	AUMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	AUMCC	JAMCC	AUMCC	FMCC	FMCC	AUMCC	JAMCC
AUMCC	FMCC	AUMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	AUMCC	JAMCC	AUMCC	FMCC	FMCC	AUMCC	JAMCC
BRMCC	FMCC	USMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC.	FMCC	BRMCC	JAMCC
CHMCC	FMCC	USMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC	FMCC	CHMCC	JAMCC
CMC	FMCC	CMC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	CMC	JAMCC	AUMCC	FMCC	FMCC	CMC	JAMCC
CMCC	FMCC	USMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC	CMCC	CMCC	JAMCC
CNMCC	FMCC	CNMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	JAMCC	JAMCC	AUMCC	FMCC	FMCC	JAMCC	JAMCC
FMCC	FMCC	FMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	FMCC	JAMCC	AUMCC	FMCC	FMCC	FMCC	JAMCC
GRMCC	GRMCC	FMCC	JAMCC	SPMCC	GRMCC	CMC	USMCC	SPMCC	AUMCC	FMCC	JAMCC	AUMCC	GRMCC	GRMCC	FMCC	JAMCC
HKMCC	FMCC	HKMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	JAMCC	JAMCC	AUMCC	FMCC	FMCC	JAMCC	JAMCC
IDMCC	FMCC	AUMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	AUMCC	JAMCC	AUMCC	FMCC	FMCC	AUMCC	JAMCC
INMCC	FMCC	CMC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	CMC	JAMCC	AUMCC	FMCC	FMCC	CMC	JAMCC
ITMCC	Nat. Pr.	FMCC	JAMCC	SPMCC	ITMCC	CMC	USMCC	SPMCC	AUMCC	FMCC	JAMCC	AUMCC	ITMCC	ITMCC	FMCC	JAMCC
JAMCC	FMCC	Nat. Pr.	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	JAMCC	JAMCC	AUMCC	FMCC	FMCC	JAMCC	JAMCC
KOMCC	FMCC	KOMCC	Nat. Pr.	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	JAMCC	JAMCC	AUMCC	FMCC	FMCC	JAMCC	JAMCC
NIMCC	FMCC	SPMCC	JAMCC	Nat. Pr.	FMCC	CMC	USMCC	SPMCC	AUMCC	NIMCC	JAMCC	AUMCC	FMCC	FMCC	SPMCC	JAMCC
NMCC	NMCC	FMCC	JAMCC	SPMCC	Nat. Pr.	CMC	USMCC	SPMCC	AUMCC	FMCC	JAMCC	AUMCC	NMCC	NMCC	FMCC	JAMCC
PAMCC	FMCC	CMC	JAMCC	SPMCC	FMCC	Nat. Pr.	USMCC	SPMCC	AUMCC	CMC	JAMCC	AUMCC	FMCC	FMCC	CMC	JAMCC
PEMCC	FMCC	USMCC	JAMCC	SPMCC	FMCC	CMC	Nat. Pr.	SPMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC	FMCC	PEMCC	JAMCC
SAMCC	FMCC	SPMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	Nat. Pr.	AUMCC	SAMCC	JAMCC	AUMCC	FMCC	FMCC	SPMCC	JAMCC
SIMCC	FMCC	AUMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	Nat. Pr.	AUMCC	JAMCC	AUMCC	FMCC	FMCC	AUMCC	JAMCC
SPMCC	FMCC	SPMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	Nat. Pr.	JAMCC	AUMCC	FMCC	FMCC	SPMCC	JAMCC
TAMCC	FMCC	TAMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	JAMCC	Nat. Pr.	AUMCC	FMCC	FMCC	JAMCC	JAMCC
THMCC	FMCC	AUMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	AUMCC	JAMCC	Nat. Pr.	FMCC	FMCC	AUMCC	JAMCC
TRMCC	TRMCC	FMCC	JAMCC	SPMCC	TRMCC	CMC	USMCC	SPMCC	AUMCC	FMCC	JAMCC	AUMCC	Nat. Pr.	TRMCC	FMCC	JAMCC
UKMCC	UKMCC	FMCC	JAMCC	SPMCC	UKMCC	CMC	USMCC	SPMCC	AUMCC	FMCC	JAMCC	AUMCC	UKMCC	Nat. Pr.	FMCC	JAMCC
USMCC	FMCC	USMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	USMCC	JAMCC	AUMCC	FMCC	FMCC	Nat. Pr.	JAMCC
VNMCC	FMCC	VNMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	JAMCC	JAMCC	AUMCC	FMCC	FMCC	JAMCC	Nat. Pr.

Figure III / A.8 : MCC Data Routing Matrix (2/2)

Note: Nat.Pr. - National Procedures.

Transmitting MCC:	AEMCC	ALMCC	ARMCC	ASMCC	AUMCC	BRMCC	CHMCC	CMC	CMCC	CNMCC	FMCC	GRMCC	HKMCC	IDMCC	INMCC
System Information:															
Sarsat Spacecraft & Ephemeris Data	LUTs	LUTs	LUTs	LUTs	ASMCC IDMCC SIMCC THMCC LUTs	LUTs	LUTs	INMCC PAMCC LUTs	LUTs	LUTs	ITMCC GRMCC NMCC TRMCC UKMCC LUTs	LUTs	LUTs	LUTs	LUTs
Cospas Spacecraft & Ephemeris Data	LUTs	LUTs	LUTs	LUTs	ASMCC IDMCC SIMCC THMCC LUTs	LUTs	LUTs	AUMCC FMCC INMCC JAMCC PAMCC SPMCC USMCC LUTs	LUTs	LUTs	ITMCC GRMCC NMCC TRMCC UKMCC LUTs	LUTs	LUTs	LUTs	LUTs
Sarsat Time Calibration	LUTs	LUTs	LUTs	LUTs	ASMCC IDMCC SIMCC THMCC LUTs	LUTs	LUTs	INMCC PAMCC LUTs	LUTs	LUTs	AUMCC CMC GRMCC ITMCC JAMCC NMCC SPMCC TRMCC UKMCC USMCC LUTs	LUTs	LUTs	LUTs	LUTs
SARP Commands											USMCC				
SARP Cmd Response & Housekeeping															
SARR Commands									USMCC						
SARR Cmd Response & Housekeeping															
System Status	SPMCC	SPMCC	USMCC	AUMCC	ASMCC CMC FMCC GRMCC IDMCC SIMCC SPMCC THMCC USMCC	USMCC	USMCC	AUMCC FMCC INMCC JAMCC PAMCC SPMCC USMCC	USMCC	JAMCC	AUMCC CMC GRMCC ITMCC JAMCC NMCC SPMCC TRMCC UKMCC USMCC	FMCC	JAMCC	AUMCC	CMC
406 MHz SARR Frequency Calibration									USMCC						

Figure III / A.9 : System Information Distribution (1/2)

Transmitting MCC:	ITMCC	JAMCC	KOMCC	NIMCC	NMCC	PAMCC	PEMCC	SAMCC	SIMCC	SPMCC	TAMCC	THMCC	TRMCC	UKMCC	USMCC	VNMCC
System Information:																
Sarsat Spacecraft & Ephemeris Data	LUTs	CNMCC HKMCC KOMCC TAMCC VNMCC LUTs	LUTs	LUTs	LUTs	LUTs	LUTs	LUTs	LUTs	AEMCC ALMCC NIMCC SAMCC LUTs	LUTs	LUTs	LUTs	LUTs	ARMCC AUMCC BRMCC CHMCC CMC CMCC FMCC JAMCC SPMCC PEMCC LUTs	LUTs
Cospas Spacecraft & Ephemeris Data	LUTs	CNMCC HKMCC KOMCC TAMCC VNMCC LUTs	LUTs	LUTs	LUTs	LUTs	LUTs	LUTs	LUTs	AEMCC ALMCC NIMCC SAMCC LUTs	LUTs	LUTs	LUTs	LUTs	ARMCC AUMCC BRMCC CHMCC CMCC PEMCC LUTs	LUTs
Sarsat Time Calibration	LUTs	CNMCC HKMCC KOMCC TAMCC VNMCC LUTs	LUTs	LUTs	LUTs	LUTs	LUTs	LUTs	LUTs	AEMCC ALMCC NIMCC SAMCC LUTs	LUTs	LUTs	LUTs	LUTs	ARMCC BRMCC CHMCC CMCC PEMCC NOAA	LUTs
SARP Commands																
SARP Cmd Response & Housekeeping															FMCC	
SARR Commands															NOAA	
SARR Cmd Response & Housekeeping															CMCC	
System Status	FMCC	AUMCC CNMCC CMC FMCC HKMCC KOMCC TAMCC USMCC VNMCC SPMCC	JAMCC	SPMCC	FMCC	CMC	USMCC	SPMCC	AUMCC	AEMCC ALMCC AUMCC CMC FMCC JAMCC NIMCC SAMCC USMCC	JAMCC	AUMCC	FMCC	FMCC	ARMCC AUMCC BRMCC CHMCC CMC CMCC FMCC JAMCC PEMCC SPMCC	JAMCC
406 MHz SARR Frequency Calibration																

Figure III / A.9 : System Information Distribution (2/2)

- END OF ANNEX III / A -

ANNEX III / B

DETAILED IMPLEMENTATION OF DATA DISTRIBUTION PROCEDURES

The following sections provide detailed implementation information on selected data distribution procedures and requirements. These procedures are agreed by the Joint Committee and apply to all MCCs unless otherwise stated. A reference to the contents of this Annex follows:

III / B.1 ALERT MESSAGE VALIDATION (FILTERING ANOMALOUS DATA)

Alert message validation should be performed at each MCC to prevent incorrect data from being transmitted to other MCCs and eventually to RCCs and SPOCs. The flowchart (Figure III / B.1) is provided to illustrate data validation procedures for ease of comprehension, given the complexity of the validation process. The flowchart is intended to clarify data validation procedures and incorporates all the validation requirements of Annex III / B. It is not intended to replace the detailed requirements provided in the remainder of Annex III / B. The associated alert message validation table (Table III / B.1) follows the logic of the flowchart and includes the same decision diamonds.

III / B.1.1 Validation of Alert Message Format and Content

Each MCC should validate all incoming LEOSAR and GEOSAR beacon alert messages based on the format and content of the SIT message.

III / B.1.1.1 Validation of SIT Message Format

The format of a SIT message should be deemed corrupt if:

- any message field is missing;
- the size of any message field is incorrect;
- a numeric message field contains non-numeric character(s); or
- a space or decimal point is incorrectly placed.

The resultant MCC action is defined by Table III / B.1.

Figure III / B.1 : 406 MHz Alert Message Validation Flowchart

SIT Format	Action
Corrupt	Suppress
Not Corrupt	See Table III / B.2

Table III / B.1 : MCC Action Based on SIT Format

	1	2	3	4	5	6	7	8	9	10	11	
	SF	**MF**	**24TTE**	**BCH-1**	**PV**	**F**	**PDF-2**	**BCH-2**	**EP**	**EF**	**D**	**BOX**
1	0											**00**
2	1	0										**00**
3	1	1	0									**00**
4	1	1	1	0							0	**00**
5	1	1	1	0							1	**01**
6	1	1	1	1	0						0	**00**
7	1	1	1	1	0						1	**01**
8	1	1	1	1	1	0			0		0	**02**
9	1	1	1	1	1	0			0		1	**03**
10	1	1	1	1	1	0			1	0	0	**04**
11	1	1	1	1	1	0			1	0	1	**05**
12	1	1	1	1	1	1			1	1	0	**02**
13	1	1	1	1	1	1			1	1	1	**03**
14	1	1	1	1	1	1	0		0		0	**02**
15	1	1	1	1	1	1	0		0		1	**03**
16	1	1	1	1	1	1	0		1	0	0	**04**
17	1	1	1	1	1	1	0		1	0	1	**05**
18	1	1	1	1	1	1	0		1	1	0	**02**
19	1	1	1	1	1	1	0		1	1	1	**03**
20	1	1	1	1	1	1	1	0	0		0	**06**
21	1	1	1	1	1	1	1	0	0		1	**07**
22	1	1	1	1	1	1	1	0	1	0	0	**08**
23	1	1	1	1	1	1	1	0	1	0	1	**09**
24	1	1	1	1	1	1	1	0	1	1	0	**06**
25	1	1	1	1	1	1	1	0	1	1	1	**07**
26	1	1	1	1	1	1	1	1	0		0	**10**
27	1	1	1	1	1	1	1	1	0		1	**11**
28	1	1	1	1	1	1	1	1	1	0	0	**12**
29	1	1	1	1	1	1	1	1	1	0	1	**13**
30	1	1	1	1	1	1	1	1	1	1	0	**10**
31	1	1	1	1	1	1	1	1	1	1	1	**11**

Table III / B.2 : 406 MHz Alert Message Validation

Legend – Flowchart abbreviation equivalence

SF: Equivalent to diamond: <"Pass SIT Format? Table III/B.1">: (0= No / 1=Yes)
MF: Equivalent to diamond: <"Pass Message Field? Table III/B.2">: (0=No / 1=Yes)
24TTE: Equivalent to diamond: <"Pass 24h TTE Validation? Sec III/B.1.2">: (0=No / 1=Yes)
BCH-1: Equivalent to diamond <"Number of Uncorrected BCH-1 errors=0? Table III/B.3">: (0=No /1=Yes)
PV: Protocol Validation (0=Fail / 1=Pass)

F: Format (0=Short / 1=Long)
PDF-2: Equivalent to diamond <PDF-2 is Not Truncated?>: (0=No / 1=Yes)
BCH-2: Equivalent to diamond <Number of uncorrected BCH-2 errors=0?>: (0=No / 1=Yes)
EP: Encoded Position (0=No / 1=Yes)
EF: Encoded Location in Footprint (0=No / 1=Yes)
D: Valid Doppler Locations. Equivalent to Diamond <D=TRUE? >:
(0 =No / 1=Yes). If YES, the flag means that there are Doppler locations available, and both Doppler locations are inside satellite footprint, if NO, it is otherwise.

Note: If a test is irrelevant in a particular context (e.g. the BCH-2 test for Short Format Messages [F=0]) then the cell in the table is shaded.

III / B.1.1.2 Validation of SIT Message Field Content

Some message fields are essential to MCC alert processing. Each MCC should validate the contents of these fields. The contents of the message fields can be validated against allowable values defined in documents C/S A.002 or C/S T.001. Message Fields 2, 4, 6, 8, 10, 12, 13, 14, 20, 21, 25, 26, 27 and 31 should be checked against the range of values contained in Table B.1 of C/S A.002. Table III / B.3 defines the resultant action of the validation process.

Message Field	Data Contents (According to C/S A.002, Table B.1)	
	In Range	Out of Range
2, 4, 6, 8, 10, 12, 13, 14, 20, 21, 25, 26, 27 and 31	Process	Suppress
Other SIT Fields	Process	Process

Table III / B.3: MCC Action Based on Message Field Content

Alert messages shall not be suppressed based on out-of-range values unless the message field is contained in the above list.

III / B.1.1.3 406 MHz Beacon Message Validation

In addition to the above validation, each MCC should perform a BCH check of all incoming 406 MHz alert messages from MCCs and LUTs to ensure that the 406 MHz beacon message (message field 23) is valid. In checking the BCH for the first protected field (bits 25 - 106), the resultant MCC action is defined by Table III / B.4.

Number of Uncorrected BCH Errors Detected in the First Protected Field	Number of Points (as defined at Message Field 21 in document C/S A.002)	
	1	≥ 2
0	Process	Process
≥ 1	Suppress	Process (Doppler Only)*

Table III / B.4: MCC Action Based on BCH Error Determination in First Protected Field of 406 MHz Alert Messages

* The matching process shall be based on bits 26 – 85 of the 406 MHz Beacon Message with no bits defaulted. No other processing shall be based on any portion of the 406 MHz Beacon Message. Distribute based on Doppler Location only.

In addition, when the first protected field has no BCH errors, each MCC should compare the beacon message contents against a known protocol specification. Specifically, the following items in the protected field(s) should be validated against C/S T.001:

- country code,
- user protocol,
- Baudot characters,
- supplementary data field,
- binary coded decimal fields, and
- encoded latitude and longitude.

A 406 MHz beacon alert message fails when one or more of the conditions in Table III / B.5 below are met.

Item to Check	Bits	Fail if:
Country Code Not Allocated	27 - 36	Decimal Value < 200 or > 780 or not allocated between 200 and 780
User Protocol	37 - 39	Bit 26 = 1 and Bits 37 - 39 = 101
Serial User Protocol	40 - 42	Bit 26 = 1 and Bits 40 - 42 = 101 or 111
Standard Location Ship Security Protocol	25 - 26	Bit 25 = 0 and Bit 26=0 and Bits 37 – 40 = 1100
Standard Location Ship Security Protocol	61 - 64	Bit 25 = 1 and Bit 26 = 0 and Bits 37 - 40 = 1100 and Bits 61 - 64 ≠ 0000
Maritime User or Radio Call Sign	82 - 83	Bit 26 = 1 and Bits 37 - 39 = 010 or 110 and Bits 82 - 83 are non-zero
Unallocated Location Protocols	37 - 40	Bit 26 = 0 and Bits 37 - 40 = 0000, 0001, 1001, or 1101
Modified Baudot Code	Varies	Unassigned Baudot Character
Binary Coded Decimal	Varies	Decimal Value for Four Bit Group > 10
Encoded Latitude and Longitude	Varies	Encoded Latitude > 90 or Encoded Longitude > 180
Supplementary Data (Standard Location Protocols)	107 - 110	Bit 26 = 0 and Bits 37 - 40 = 0010, 0011, 0100, 0101, 0110, 0111 1110, and Bits 107 - 110 ≠ 1101
Supplementary Data (Standard Location Ship Security Protocol)	107 - 110	Bit 25 = 1 and Bit 26 = 0 and Bits 37 - 40 = 1100, and Bits 107 - 110 ≠ 1101
Supplementary Data (National Location Protocol, Short)	107 - 110	Bit 25=0 and Bit 26 = 0, and Bits 37 - 40 = 1000, 1010, 1011 or 1111, and Bits 107 - 110 ≠ 1101
Supplementary Data (National Location Protocol, Long)	107 - 109	Bit 25=1 and Bit 26 = 0, and Bits 37 - 40 = 1000, 1010, 1011 or 1111, and Bits 107 - 109 ≠ 110

Table III / B.5 : Protocol Validation for 406 MHz Alert Messages

The appropriate action by an MCC based on the results of the comparisons of Table III / B.5 are given in Table III / B.6 below.

Protocol Check Results	**Number of Points** (as defined at Message Field 21 in document C/S A.002)	
	1	≥ 2
Pass	Process	Process
Fail	Suppress	Process (Doppler Only)*

Table III / B.6 : MCC Action Based on Result of Protocol Validation in First Protected Field of 406 MHz Alert Messages

* The matching process shall be based on bits 26 – 85 of the 406 MHz Beacon Message with no bits defaulted. No other processing shall be based on any portion of the 406 MHz Beacon Message. Distribute based on Doppler Location only.

If the second protected field (bits 107 - 144) has uncorrected BCH errors, then no processing shall be based on any portion of this field, except for the Supplementary Data Bits as defined in Table III / B.5.

III / B.1.1.4 Additional Validation

MCCs may perform additional validation to meet national requirements, however, additional validation shall not affect the distribution of data to other MCCs.

III / B.1.2 24-Hour Time Tag Errors (Cospas)

Each MCC should implement procedures to filter out 24-hour time tag errors. One method to determine a 24-hour error at the MCC is to compare each new 406 MHz alert to alerts on file for the same beacon ID. If a prior alert from the same satellite for the same beacon with a TCA which was 24 hours earlier (± 20 minutes) is on file at the MCC, the new alert can be assumed to be in error and suppressed from further transmission.

III / B.1.3 Doppler Position Footprint Validation

Each MCC shall implement the algorithm for determining if the Doppler positions are inside the satellite footprint at the time of detection as per Figure B.2 of the Cospas-Sarsat MCC Standard Interface Description, C/S A.002 document. If one of the LEOSAR Doppler positions is conclusively outside the footprint then the alert shall be processed based only on the 406 MHz beacon message and the Doppler solution data shall not be distributed.

III / B.1.4 Encoded Position Footprint Validation

Each MCC shall implement the algorithm for determining if the encoded position is inside the satellite footprint at the time of detection (MF#14 per C/S A.002) as per Figure B.2 of the Cospas-Sarsat MCC Standard Interface Description, C/S A.002 document. If the encoded position is conclusively outside the footprint then no processing shall be based on the encoded position.

III / B.2 POSITION MATCHING

Position matching is the comparison of the computed distance between two beacon positions and a set distance criterion. It is used to decide if two positions should be considered operationally as a unique beacon position or as separate beacon positions. The matching process can include other technical parameters.

Matching criteria are necessary to determine if two sets of independent position data should be regarded as corresponding to the same beacon position. Such matching criteria are used in the ambiguity resolution process to determine whether two Doppler positions from two independent beacon events, or an encoded position and a Doppler position, are sufficiently close to determine which Doppler position is the "true" position and which is the image or incorrect position(s). Matching criteria are also used, before ambiguity resolution, to decide if a separate alert message should be transmitted for a beacon when a new position is at a distance from any previously received position greater than the distance separation defined by the matching criteria.

The points listed below concerning the matching of positions apply to the matching criteria distance to be used by MCCs:

a) for Doppler to Doppler matches and Doppler to encoded matches, the distance match criterion to be used for ambiguity resolution and for position conflict determination shall be the same;

b) the Doppler to Doppler distance match criterion shall be 50 kilometres;

c) the Doppler to encoded distance match criterion shall be 50 kilometres;

d) the encoded to encoded distance match criterion shall be 3 kilometres;

e) each of the above three distance match criterion shall be configurable;

f) in the match process, the "best" match shall be used to resolve ambiguity when multiple candidate positions meet the match criterion; however

g) if both pairs of Doppler positions meet the match criterion prior to ambiguity resolution for different satellite passes, this is deemed an Unresolved Doppler Position Match (see Fig. III / B.2) and:

   (i) ambiguity shall not be resolved from either pair of Doppler positions; and

   (ii) other pairs of positions shall remain eligible to resolve ambiguity, even if the "best" distance match was between ineligible Doppler positions.

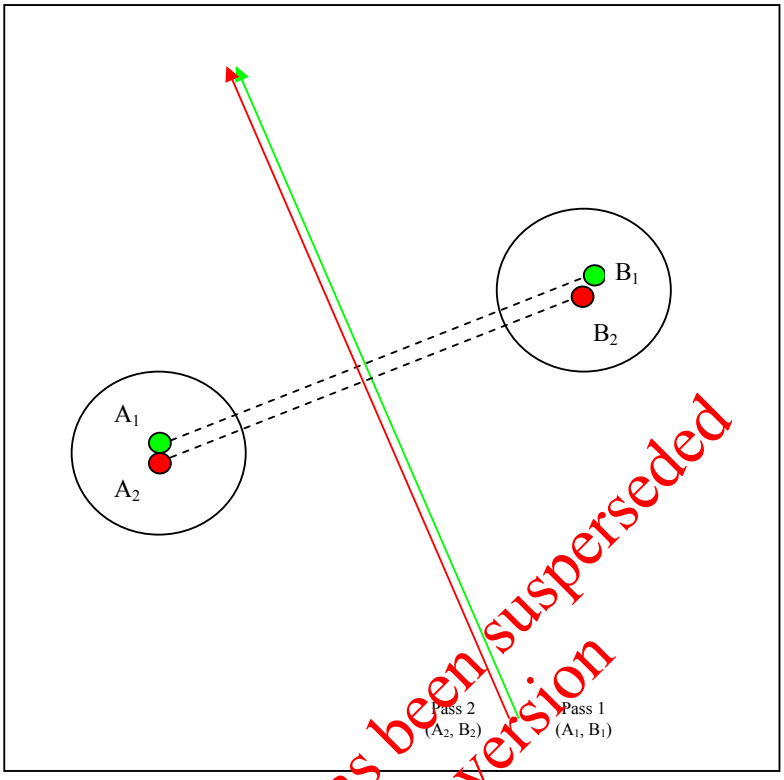


Figure III / B.2 : Unresolved Doppler Match Scenario (50 km circles)

III / B.3 AMBIGUITY RESOLUTION

Ambiguity resolution is the determination of the confirmed beacon position (the resolved position). This is achieved by the matching of Doppler position data from two unique LEO satellite passes (beacon events), the matching of encoded position data with Doppler position data from a LEO satellite pass, or by using operational criteria. Details on position matching are provided in Annex III / B.2.

Ambiguity resolution is necessary because some uncertainty exists in the determination of a unique beacon position when position information is available from only one data source - either an encoded position or Doppler positions from a single LEO satellite pass. This uncertainty can be resolved by successfully matching position data from at least two independent beacon events which may consist of two LEO satellite passes providing independent Doppler positions, or only one LEO satellite pass providing Doppler positions and an encoded position provided by the Cospas-Sarsat LEOSAR system or a GEOSAR system. Two separate inputs with encoded position only **cannot** be considered as independent beacon events. However, ambiguity resolution can be achieved with position data from a single LEO satellite pass when encoded position information is available and it matches one of the computed Doppler positions.

Based on the principles above, the following rules concerning ambiguity resolution notifications apply between MCCs:

a) alert data shall be transmitted between MCCs until ambiguity is resolved;

b) all MCCs shall provide ambiguity resolution notification;

c) MCCs shall send an ambiguity resolution notification to each MCC that has the resolved position or a previous image position in its service area;

d) alert data will not be transmitted between MCCs after ambiguity is resolved unless an MCC requests continued transmission; and

e) an MCC requesting continued transmission after ambiguity resolution should co-ordinate its request with the appropriate MCC(s).

III / B.4 PROCEDURES TO DETERMINE BETTER QUALITY ALERT DATA FOR SAME BEACON EVENT POSITION CONFLICTS

III / B.4.1 Introduction

A position conflict exists when an alert is received at an MCC and the position data fails to match (see section III / B.2 above) any previously received position data for the same beacon. The filtering procedure detailed below should be used by MCCs for filtering **Doppler** position conflict alerts for the same beacon event when position ambiguity has not been resolved, or continued transmission has been requested.

The purpose of the filtering procedure is to minimise the distribution of alert messages containing "poor" quality Doppler position data. If a new alert with Doppler position conflict is for the same beacon event as previously received data, additional checks can be performed to determine if the new Doppler position data is of better quality than previously received Doppler position data and should be transmitted, or is of poorer quality and can be deemed redundant. If the relative quality of the Doppler positions cannot be determined, then the new data should be transmitted. The procedure below ensures that "good" data will not be suppressed while limiting the amount of erroneous data distributed to RCCs and SPOCs.

III / B.4.2 Position Conflict Procedure

An MCC should identify a reference alert with Doppler position data for each beacon event. By default, the first alert for each pass becomes the reference until another alert of better quality is received. Should an alert with new Doppler position data for the same beacon event be received which is determined to be of better quality, the new alert becomes the reference and a position conflict alert is transmitted.

An MCC determines if a new alert contains Doppler position data of better quality by performing the following checks in sequence. The appropriate action is then taken as indicated (see Table III / B.6).

Step 1:

If both alerts have a bias standard deviation less than 20 Hz, then proceed to Step 2. If both alerts have a bias standard deviation equal to or greater than 20 Hz, or if either

bias standard deviation is not available, then quality differentiation cannot be made and the new alert is transmitted.
If the reference alert has a bias standard deviation equal to or greater than 20 Hz, and the new alert has a bias standard deviation less than 20 Hz, then the new alert is deemed to be of better quality, a position conflict alert is transmitted, and the new alert becomes the reference alert. If the reverse is true, the new alert is deemed to be of poorer quality and the new alert is not transmitted.

Step 2:

In this step both alerts are assumed to have bias standard deviations less than 20 Hz. If both alerts have WF values < 2, then go to Step 3. If the new alert contains a WF ≥ 2, then the new alert is not transmitted. If the WF of the reference alert contains a value ≥ 2 and the new alert contains a WF < 2, then the new alert is transmitted and becomes the reference alert. If both alerts have WF values ≥ 2, then quality differentiation cannot be made and the new alert is transmitted.

Step 3:

This step applies when both bias standard deviations are < 20 Hz and both Window Factors are < 2. In this case, the dimensions of the minor axis of the error ellipse are compared.

If the error ellipse minor axis (MIN) of the new alert is ≥ 99.9 and the MIN of the reference alert < 99.9, then the new alert is not transmitted. If the MIN for the new alert is < 99.9 and the MIN for the reference alert is ≥ 99.9, then the new alert is transmitted and becomes the reference alert. Finally, if either of the above conditions are not met, then quality differentiation cannot be made and the new alert is transmitted.

If for any reason the relative quality cannot be determined in the comparison of the Doppler positions from alerts for the same beacon event, the new position data should be transmitted.

	Parameters						
	Bias Std Dev (Hz) MF #13		**Window Factor (0 - 9) MF #15**		**Min. Error Ellipse (km) MF #27**		
Steps	Reference Alert	New Alert	Reference Alert	New Alert	Reference Alert	New Alert	Action
Step 1	< 20 Hz	< 20 Hz					Go to Step 2
	default [1]	default [1]					New alert transmitted
	≥ 20 Hz	< 20 Hz					New alert transmitted [2]
	< 20 Hz	≥ 20 Hz					New alert NOT transmitted
	≥ 20 Hz	≥ 20 Hz					New alert transmitted
Step 2	< 20 Hz	< 20 Hz	< 2	< 2			Go to Step 3
	< 20 Hz	< 20 Hz	< 2	≥ 2			New alert NOT transmitted
	< 20 Hz	< 20 Hz	≥ 2	< 2			New alert transmitted [2]
	< 20 Hz	< 20 Hz	≥ 2	≥ 2			New alert transmitted
Step 3	< 20 Hz	< 20 Hz	< 2	< 2	< 99.9	≥ 99.9	New alert NOT transmitted
	< 20 Hz	< 20 Hz	< 2	< 2	≥ 99.9	< 99.9	New alert transmitted [2]
	< 20 Hz	< 20 Hz	< 2	< 2	< 99.9	< 99.9	New alert transmitted
	< 20 Hz	< 20 Hz	< 2	< 2	≥ 99.9	≥ 99.9	New alert transmitted

1 indicates that at least one bias standard deviation is not available.
2 indicates that the new alert becomes the reference alert.

Table III / B.7 : Procedures to Determine Better Quality Alert Data for Same Beacon Event Position Conflicts

III / B.5 DETAILED PROCEDURES FOR ALERT DATA DISTRIBUTION

III / B.5.1 Analysis and General Representation of Alert Data Processing

Alert data received by a Cospas-Sarsat MCC, either from its associated LUTs or from another MCC, must be forwarded to a MCC, a SPOC or a RCC if it contains 'new' information useful to SAR services. The alert data distribution process consists of a set of rules commonly used by Cospas-Sarsat MCCs for deciding whether new input data concerning a particular 406 MHz beacon ID contains 'new' information. It is based on a number of parameters (defined in the document C/S G.004 'Cospas-Sarsat Glossary') and matching rules (defined in this document), which include:

- the definitions of 'beacon events', 'ambiguity resolution' and 'position conflict'; and
- the definition of distance criteria for matching Doppler and encoded position data.

However, these basic rules and the variety of position data available in 406 MHz alert messages create a large number of possible combinations which need to be thoroughly analysed to ensure the consistency of the alert data distribution process throughout the Cospas-Sarsat MCC network.

In order to implement this data distribution process, the 'position information content' of each valid incoming alert message (referred to as 'Input' or 'I' in this Annex) must be compared with the information already transmitted concerning the same beacon ID. Therefore, the history of all data already transmitted must be preserved. For each beacon ID, that history can be summarised in a 'Status word' (Sw). Input and Status words are both characterised by the type of position information (received in the input or transmitted in previous messages). Similarly, the 'action(s)' resulting from the process (i.e. the message to be transmitted, its format and recipients) can be summarised in an 'Action word' (Aw) and characterised by the type of position information to be forwarded, taking also into account position data already distributed. The functional relations between 'Input', 'Status word' and 'Action word' in the process are summarised in Figure III / B.2.

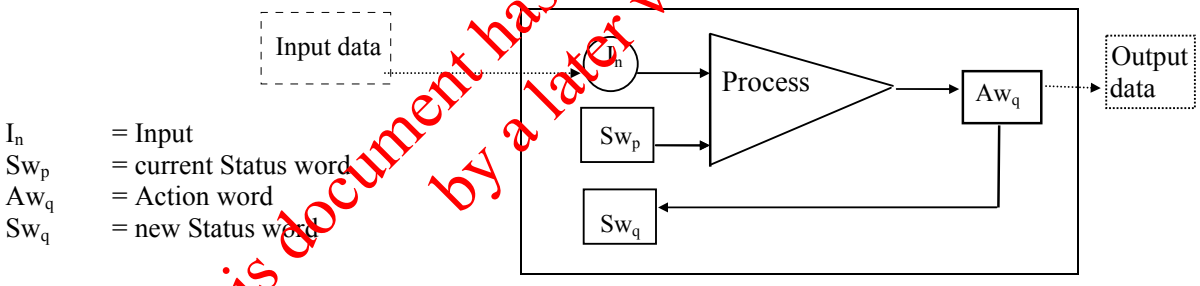


Figure III / B.2 : Alert Data Processing Concept

III / B.5.2 Definition of Input, Status and Action Words

The possible combinations of position data which characterise an input (I), the current status (Sw) or the resulting action (Aw) of the process concerning a given beacon ID, are described in Figure III / B.3. No other combinations of the type of position data are allowed and the possible position information contents of I, Sw and Aw are summarised in the last column.

Figure III / B.3 : Definition of the Input, Status and Action Words for 406 MHz Alerts

Input	Type of position data					Status word	Action word	Comments
	No Position Data	A / B Doppler Positions	Encoded Position Data	Doppler Amb. Resolved	D & E Positions Matched			Position Information Content
-	0	0	0	0	0	Sw_0	Aw_0	No message received or sent
I_1	1	0	0	0	0	Sw_1	Aw_1	Unlocated alert
I_2	0	1	0	0	0	Sw_2	Aw_2	A / B Doppler positions only
I_3	0	0	1	0	0	Sw_3	Aw_3	Encoded position only
I_4	0	1	1	0	0	Sw_4	Aw_4	A, B & E positions all unmatched
I_5	0	1	0	1	0	Sw_5	Aw_5	Doppler pos. only, ambiguity. resolved.
I_6	0	1	1	1	0	Sw_6	Aw_6	D pos. (amb. resolved) + E pos. unmatched
I_7	0	1	1	1	1	Sw_7	Aw_7	Resolved positions (D & E matched)

Notes: - The Input word (I) is specific to each individual input and independent of the origin of the data (e.g. another MCC or the LUTs associated with the receiving MCC).

- The Status word (Sw) summarises all previous inputs and actions in respect of a particular beacon ID. Sw_5, Sw_6 and Sw_7 are functionally equivalent in the process since no further transmissions are required after ambiguity resolution. However, the distinction between the various position information contents after ambiguity resolution is relevant for the Input and Action words.

- The Actions to be carried out as a result of the process depend on the Input / Status combination, but also on the results of comparisons (matching tests) between 'old' and 'new' position data received by the MCC, as shown in the matrix (Figure III / B.3). The selected Action word is also used to define the message format to be sent and, before ambiguity resolution, characterises the new status associated with that beacon ID after completion of the selected Action (i.e.: $Aw_i \longrightarrow Sw_i$).

III / B.5.3 Process Matrix for Alerts

The process is summarised in Figure III / B.4 which defines, for each Input / Status combination, the possible output (Action words), the corresponding SIT message numbers (to be used if the new data in the Input has to be forwarded to another MCC, outside the processing MCC service area) and the appropriate recipient(s) of this information, as determined by the geographic sorting of position data.

III / B.5.3.1 Processing Before Ambiguity Resolution (Sw_0 , Sw_1 , Sw_2 , Sw_3 , Sw_4 Status)

The process is quite simple when no data was previously received for the beacon ID in a new Input (Status Sw_0), or when the previously received alert(s) for that ID did not include any position information (Status Sw_1).

However, as shown in Figure III / B.4, a number of Input / Status combinations may result in several possible Actions. This occurs when a number of alert messages have been received prior to the new input, but the available position data did not satisfy the matching criteria for ambiguity resolution. The new position data in the input message must then be compared with all positions previously received for the same beacon ID, and these matching tests can lead to different Actions. The position information content of each possible Action is used to select the appropriate Action word as illustrated in the special algorithm described in section B.5.4 (Figures III / B.5, III / B.6, III / B.7 and III / B.8).

III / B.5.3.2 Processing After Ambiguity Resolution (Sw_5 , Sw_6 , Sw_7 Status)

After ambiguity resolution, the distribution of incoming alert data is normally discontinued, unless continued transmission is specifically requested by a SPOC or an MCC. If continued transmission is requested, a different processing logic must be implemented since the initial objective of increasing the position information content to obtain a resolved position has already been achieved. To reflect this different approach, the new 'Actions' are identified in the matrices as Ct_i (see Figures III / B.4 and III / B.8).

All incoming position data is compared to the last resolved position transmitted by the MCC, in accordance with the usual processing criteria. If the process results in an Action different from Ct_0 (redundant data not to be distributed), the incoming position data is sent to the destination(s) which requested the continued transmission.

Notes:

The suffix of Inputs (I words), Actions (Ct) and Status (Sw) remain consistent with the definitions of Figure III / B.3, although there is no practical differences between the three Status words (Sw_5, Sw_6, and Sw_7) in terms of processing after ambiguity resolution in the proposed procedure.

Although Figure III / B.4 indicates several possible outcome for all Inputs but one after ambiguity resolution, only one comparison is performed between the new position data in the Input and the known resolved position. Therefore, the outcome is always unambiguous and no 'priority rule' is required.

Figure III / B.4 : Processing Matrix, Message Formats and Distribution of 406 MHz Alerts

	I_1 (no position data)			I_2 (A / B Doppler positions)			I_3 (Encoded only)			I_4 (A / B / E unmatched)			I_5 (Resolved Doppler)			I_6 (Res. D + E unmatched)			I_7 (Resolved D and E)		
	Aw	SIT	Dest	Aw	SIT	Dest	Aw	SIT	Dest	Aw	SIT	Dest	Aw	SIT	Dest	Aw	SIT	Dest	Aw	SIT	Dest
Sw_0	Aw_1	122	C	Aw_2	125	AB	Aw_3	122	E	Aw_4	126	ABE	Aw_5	127	R	Aw_6	127	R	Aw_7	127	R
Sw_1	Aw_0	-	-	Aw_2	125	AB	Aw_3	122	E	Aw_4	126	ABE	Aw_5	127	R	Aw_6	127	R	Aw_7	127	R
	Aw_1	122	C																		
Sw_2	Aw_0	-	-	Aw_5	127	RI	Aw_7	124	RI	Aw_7	127	RI	Aw_5	127	RI	Aw_6	127	RI	Aw_7	127	RI
				Aw_0	-	-	Aw_4	123	E	Aw_6	127	RI									
				Aw_2	126	AB				Aw_4	126	ABE									
				Aw_2	125	AB															
Sw_3	Aw_0	-	-	Aw_7	127	RI	Aw_0	-	-	Aw_7	127	RI	Aw_7	127	RI	Aw_7	127	RI	Aw_7	127	RI
				Aw_4	126	AB	Aw_3	123	E	Aw_4	126	ABE	Aw_6	127	RI	Aw_6	127	RI			
Sw_4	Aw_0	-	-	Aw_7	127	RI	Aw_7	124	RI	Aw_7	127	RI	Aw_7	127	RI	Aw_7	127	RI	Aw_7	127	RI
				Aw_6	127	RI	Aw_0	-	-	Aw_6	127	RI	Aw_6	127	RI	Aw_6	127	RI			
				Aw_0	-	-	Aw_4	123	E	Aw_0	-	-									
				Aw_4	126	AB				Aw_4	126	ABE									
Sw_5 Sw_6 Sw_7	Ct_0	-	-	Ct_0	-	-	Ct_0	-	-	Ct_0	-	-	Ct_0	-	-	Ct_0	-	-	Ct_0	-	-
				Ct_2	126	RD	Ct_3	123	RD	Ct_4	126	RD	Ct_5	127	RD	Ct_6	127	RD	Ct_7	127	RD
				Ct_5	127	RD	Ct_7	124	RD	Ct_7	127	RD									

Notes:.JC-23.Annex 4.

I_i = Input
Sw_i = Status word
Aw_i = Action word
Ct_i = Continue transmission

A = A Doppler position
B = B Doppler position
E = Encoded position

R = Resolved position
I = Incorrect previous position(s)
C = Country code destination
RD= Requesting destination

Dest = Destination of SIT message
SIT = Subject Indicator Type / (standard message format)

III / B.5.4 Special Processing Procedures

III / B.5.4.1 Tests and Flag Setting for Special Processing Procedures

a) Before ambiguity resolution, five flags may be positioned to determine the output of an In / Swp combination which requires special procedures:

DEM = Doppler / Encoded positions Matching flag : set to "1" if a Doppler position and an Encoded position match the distance separation criterion (and other criteria as may be required) and set to "0" otherwise. However, in some Input / Status combinations this flag has no relevance, for example, if the Input is the I_2 type, containing only Doppler position data. In such cases the DEM flag is assumed to be set to default value "0".

In the DEM test, the E position is compared to all previously received Doppler positions (A / B solutions or resolved D position). Alternatively, the A / B Doppler positions of the Input are compared with any E position previously received at the MCC. A correct match with one solution of a Doppler location is sufficient to resolve the Doppler ambiguity. It also provides very reliable information since the D and E data are totally independent.
SBE = the 'Same Beacon Event' flag (same beacon ID, same satellite, same TCA) is to be set for each matching test as follows:

SBE set to "1" if previous A / B Doppler positions to be compared with Input are from same satellite and same TCA, and

SBE set to "0" if previous A / B Doppler positions to be compared with Input are not from same satellite and same TCA.

The SBE flag is used only in relation with the Doppler to Doppler position matching tests. It has no relevance for DEM or EEM tests and is assumed to be set to the default value "0" in such cases.

DDM = Doppler / Doppler positions Matching flag : set to "1" if two Doppler positions match the distance separation criterion (and other criteria as may be required) and set to "0" otherwise. For an Unresolved Doppler Position Match (as specified in Annex III / B.2) set to "0". However, in some Input / Status combinations this flag has no relevance, for example, if the current status is Sw_3 (previous alert data received at the MCC contain only encoded position data). In such cases the DDM flag is assumed to be set to default value "0".

EEM = Encoded position / Encoded position Matching flag : set to "1" if two encoded positions match the distance separation criterion (and other criteria as may be required) and set to "0" otherwise. However, the EEM test is relevant only in a limited number of cases (e.g. for the processing of I_3 type Inputs (E position only) in a Sw_3 context (only E positions were previously received)). In all other situations the EEM flag should be set to its default value "0".

PQF = Poor Quality Flag : The Poor Quality Flag is used in conjunction with the DDM test only, when a position conflict exists between Doppler positions for the same beacon event (SBE = 1 and DDM = 0). In such cases, parameters characterising the quality of the position data are tested to determine whether the new data provide a better quality position.

PQF is set to "1" if the new position data is of inferior quality than the data previously processed by the MCC for the same beacon event. The new data should then be considered as redundant.

PQF is set to "0" if the new position data is of better quality than the data previously processed for the same beacon event, or if the relative quality of the new versus the old position data cannot be determined. The new data should then be forwarded as a position conflict alert.

b) After ambiguity resolution, if continued transmission of alerts for a particular beacon ID has been requested, the same principles apply, but input Doppler position is compared for redundancy test only with the resolved (R) position previously distributed by the MCC, and all additional information is forwarded to the recipient of the resolved position data (no additional geographic sorting is performed using the new position data) or to the requesting MCC/SPOC.

In this context, the DDM test is reinterpreted as a DRM test (Doppler / Resolved position Matching). Input encoded position is compared for redundancy test with the resolved (R) position previously distributed by the MCC only if there is no previous encoded position. The SBE and PQF tests are unchanged in their definition. The DEM test is not applicable after ambiguity resolution.

III / B.5.4.2 Selection of the Relevant Action in Input / Status Combinations with Multiple Outputs

When the Iw Sw combination leads to several possible actions, it is essential to clarify which Action in the sequence supersedes others and should be completed. The logic to be followed in this selection is always that:

Actions enhancing the 'position information content' of the alert to be forwarded by the MCC should have overall precedence ($Aw_7 > Aw_6 > Aw_5 >$ etc.) provided the 'position information content' (or suffix) of the Action word is superior to the suffix of the current Status word; and

Action Aw_0 (which means that the same data as in the Input has already been processed) has precedence over an Action which has same 'position information content' as the current Status (in Sw_4 status, $Aw_0 > Aw_4$). This rule reflects the fact that the Input is redundant, i.e. the Input matches all the characteristics of at least one set of data previously received, and all other matching tests have failed to enhance the 'position information content' of the possible output.

III / B.5.4.3 Definition of Special Processing Matrices

Special processing matrices are defined for each Status of the process to clarify the implementation of the test sequence to be performed for each possible input data. The Input / Status combinations which have a unique output Action (see Figure III / B.4) are not repeated in the special processing matrices shown in the following sections.

Notes:

Shaded cells in the 'Input' columns correspond to flag combinations which are not applicable for the particular Input / Status combination.

The default value for all flags is "0". If a test is irrelevant in a particular context (e.g. in the Sw_2 status, DEM = 1 and DDM = 1 means the PQF test is irrelevant) then the corresponding flag is set to "0" and the cell in the matrix is shaded. The flag column is entirely shaded if the corresponding test is inapplicable for all inputs in the Sw context (e.g. the EEM column in the Sw_2 status).

An "X" indicated in the flag column means that both flag values are possible, but the actual flag value does not affect the output Action (therefore the test can be ignored in this context).

III / B.5.4.3.1 Sw_2 Special Processing Matrix

A and B Doppler positions for the same beacon ID have already been processed by the MCC which receives the new input 'a'.

Since no encoded position has previously been received, the EEM test is irrelevant (see shaded column). Similarly, the PQF test is irrelevant when a DEM test or a DDM test show a successful match (DEM = 1 and / or DDM =1).

Figure III / B.5 : Special Processing for Sw_2 Status

DEM	SBE	DDM	PQF	EEM	I_2 [A / B]	I_3 [E]	I_4 [A / B / E]
1	X	1	0	0			Aw_7
1	X	0	0	0		Aw_7	Aw_7
0	1	1	0	0	Aw_0		Aw_4
0	1	0	1	0	Aw_0		Aw_4
0	1	0	0	0	Aw_2	Aw_4	Aw_4
0	0	1	0	0	Aw_5		Aw_6
0	0	0	0	0	Aw_2	Aw_4	Aw_4
Aw priority if multiple matching tests are required					Aw_5 > Aw_0 > Aw_2	Aw_7 > Aw_4	Aw_7 > Aw_6 > Aw_4

III / B.5.4.3.2 Sw_3 Special Processing Matrix

An 'E' (encoded) position for the same beacon ID has already been processed by the MCC which receives the new input 'i', but no Doppler position data were received.

Therefore, the Doppler / Doppler matching tests, and the associated SBE and PQF tests, are irrelevant in this Status (columns SBE, DDM and PQF are shaded).

Figure III / B.6 : Special Processing for Sw_3 Status

DEM	SBE	DDM	PQF	EEM	I_2 [A / B]	I_3 [E]	I_4 [A / B / E]	I_5 [D]	I_6 [D+(E)]
1	0	0	0	1			Aw_7		Aw_7
1	0	0	0	0	Aw_7		Aw_7	Aw_7	Aw_7
0	0	0	0	1		Aw_0	Aw_4		Aw_6
0	0	0	0	0	Aw_4	Aw_3	Aw_4	Aw_6	Aw_6
Aw priority if multiple matching tests are required					Aw_7 > Aw_4	Aw_0 > Aw_3	Aw_7 > Aw_4	Aw_7 > Aw_6	Aw_7 > Aw_6

III / B.5.4.3.3 Sw_4 Special Processing Matrix

A / B Doppler positions and encoded position data for the same beacon ID have already been processed by the MCC which receives the new input, but no Doppler / Doppler or Doppler / encoded position matching tests have been successful.

Figure III / B.7 : Special Processing for Sw_4 Status

DEM	SBE	DDM	PQF	EEM	I_2 [A / B]	I_3 [E]	I_4 [A / B / E]	I_5 [D]	I_6 [D+(E)]
1	X	1	0	0	Aw_7		Aw_7	Aw_7	Aw_7
1	X	0	0	0	Aw_7	Aw_7	Aw_7	Aw_7	Aw_7
0	1	1	0	1			Aw_0		Aw_6
0	1	1	0	0	Aw_0		Aw_4	Aw_6	Aw_6
0	1	0	1	1			Aw_0		Aw_6
0	1	0	1	0	Aw_0		Aw_4	Aw_6	Aw_6
0	X	0	0	1		Aw_0	Aw_4		Aw_6
0	X	0	0	0	Aw_4	Aw_4	Aw_4	Aw_6	Aw_6
0	0	1	0	1			Aw_6		Aw_6
0	0	1	0	0	Aw_6		Aw_6	Aw_6	Aw_6
Aw priority if multiple matching tests are required					Aw_7 > Aw_6 > Aw_0 > Aw_4	Aw_7 > Aw_0 > Aw_4	Aw_7 > Aw_6 > Aw_0 > Aw_4	Aw_7 > Aw_6	Aw_7 > Aw_6

III / B.5.4.3.4 Special Filtering Matrix After Ambiguity Resolution

It is assumed that continued transmission has been requested, otherwise no action should be taken when receiving new alerts for the particular beacon ID under consideration.

The filtering procedure after ambiguity resolution is as follows:

- the Doppler position data received in the new input is compared only to the resolved position (R) used for reference (i.e. the DRM test replaces the DDM test);
- the encoded position data received in the new input is compared to previous encoded position, unless there is no previous encoded position, in which case it is compared to the resolved position (R) used for reference;
- all new beacon events are transmitted; and
- position data for same beacon events is forwarded if any one of the possible tests fails.

Figure III / B.8 : Special Processing for Sw_5, Sw_6 and Sw_7 Status

SBE	DRM	PQF	EEM*	I_2 [A / B]	I_3 [E]	I_4 [A / B / E]	I_5 [D]	I_6 [D+(E)]	I_7 [Resol. D+E]
1	1	0	1			Ct_0		Ct_0	Ct_0
1	1	0	0	Ct_0		Ct_4	Ct_0	Ct_6	Ct_7
1	0	1	1			Ct_0		Ct_0	Ct_0
1	0	1	0	Ct_0		Ct_4	Ct_0	Ct_6	Ct_7
1	0	0	1		Ct_0	Ct_4		Ct_6	Ct_7
1	0	0	0	Ct_2	Ct_3	Ct_4	Ct_5	Ct_6	Ct_7
0	1	0	1			Ct_4		Ct_6	Ct_7
0	1	0	0	Ct_5		Ct_4	Ct_5	Ct_6	Ct_7
0	0	0	1		Ct_3	Ct_4		Ct_6	Ct_7
0	0	0	0	Ct_2	Ct_3	Ct_4	Ct_5	Ct_6	Ct_7

* The encoded position data received in the new input is compared to the resolved position (R) used for reference if there is no previous encoded position.

III / B.6 DISTRIBUTION OF BEACON REGISTRATION INFORMATION

The identification data in the beacon message includes a code which identifies the country where the beacon is registered. When an MCC acquires distress alert or NOCR data (based on the alerts country code), the MCC can determine if it has access to the registry data. If so, the beacon registration could be transmitted to the MCC in whose service area the Doppler or encoded position is located using the SIT 925 message format. Registration data shall be routed in accordance with Figure III / A.8. The registration data would only be sent upon the first reception of an alert or NOCR message.

The message code contained in the SIT 925 message can be used by the receiving MCC to correlate it to a previously received alert message and forward the registry data to the appropriate RCC/SPOC.

An MCC is not required to automatically transmit registration data from its registry to other MCCs. However, the reception of this data is required by all MCCs.

An MCC receiving an NOCR alert may respond with registration data without being specifically requested.

III / B.7 NOCR PROCEDURES

III / B.7.1 Procedure

An NOCR message is initiated by an MCC when a 406 MHz alert for a beacon ID is first located in its service area and the country code in the 406 MHz beacon message is associated with another country's search and rescue region (SRR). The MCC service area includes the entire service area of the MCC and is not limited to its national SRR. When the beacon country code in the 406 MHz beacon message is associated with a country's search and rescue region (SRR) in the service area of an MCC sending the first location (Doppler or Encoded), the same MCC should also process and send an NOCR message to the associated country's SPOC or RCC. The location can be provided by either Doppler location processing, or by the encoded position contained in beacons coded using a location protocol. In some conditions, multiple MCCs may initiate an NOCR message to the same support MCC.

An MCC in whose service area an alert is located (A, B and/or encoded position solution), transmits the NOCR message to the associated MCC (i.e., the destination MCC) based on the distribution matrix provided in Figure III / A.8. The appropriate associated MCC for NOCR message distribution is determined by the country code contained in the beacon ID of the message.

In addition to distributing the NOCR message to the appropriate SPOC, the associated MCC should also process the NOCR message as an alert message, in accordance with Figure III/B.4: Processing Matrix, Message Formats and Distribution of Alerts.

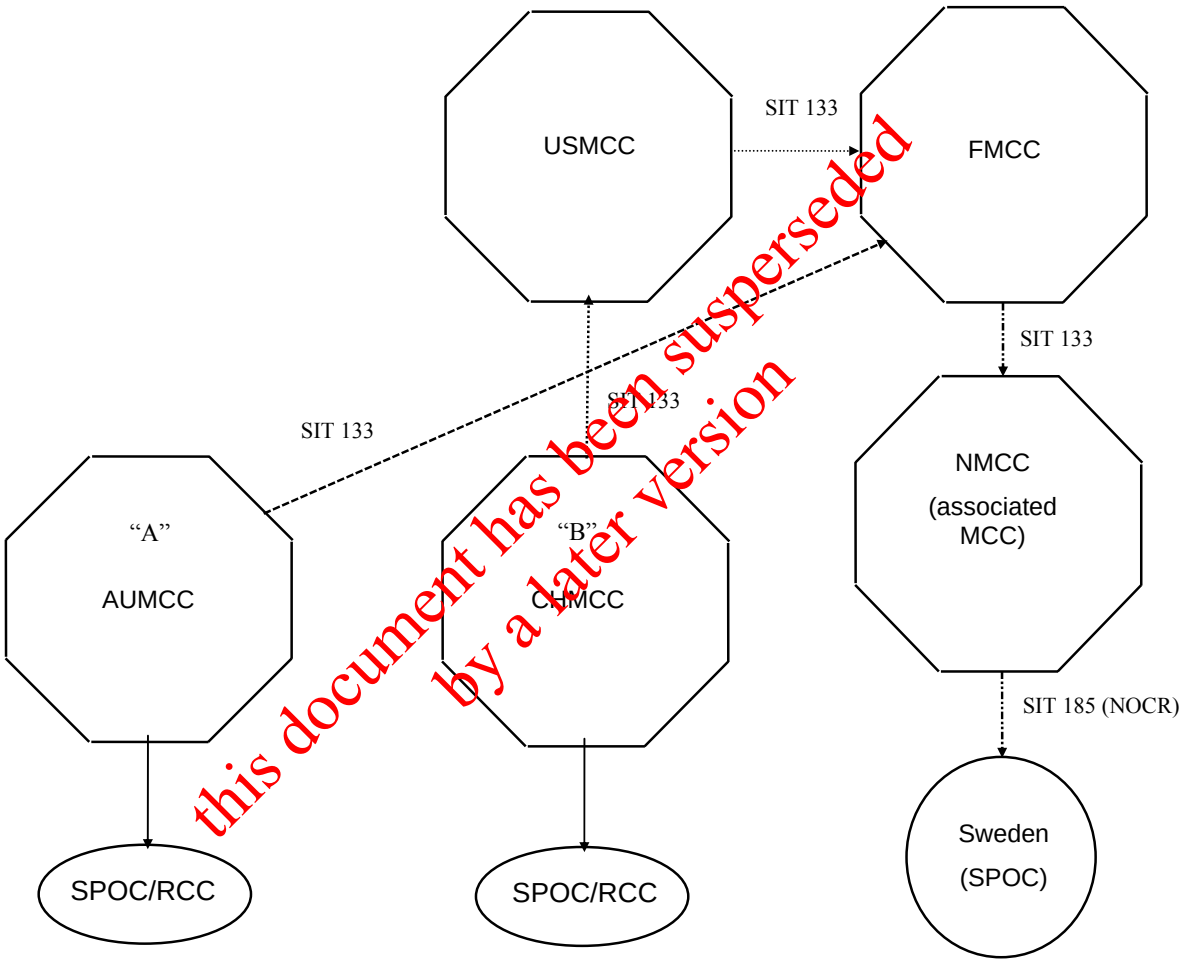
An NOCR message is not required for unlocated alerts because, by definition, the message initiation process is based on geographic position information. An MCC is not required to send an NOCR message to another MCC when the sending MCC has already sent to the receiving MCC an alert located in the service area of the receiving MCC.

The receiving MCC may filter redundant NOCRs for the same beacon ID.

III / B.7.2 NOCR Example

Scenario

Country code in Beacon ID: Sweden (265)
"A" Position Service Area: AUMCC (Australian MCC)
"B" Position Service Area: CHMCC (Chilean MCC)



III / B.8 DISTRIBUTION OF 406 MHz SHIP SECURITY ALERTS

The identification data in the beacon message includes a protocol code which can identify the 406 MHz transmission as a ship security alert. In addition, the beacon message also contains a country code which can be associated with the "flag state" of the vessel. When an MCC receives a ship security alert, the alert should be processed according to the same procedures that apply for distress alerts except that the resulting ship security alert message will be forwarded based only on the country code included in the beacon message.

All States wishing to use the Cospas-Sarsat System to relay ship security alerts should make the necessary arrangements with their associated MCC. Arrangements should include the identification of the competent authority responsible for receiving the ship security alert and the communication link to the competent authority

III / B.8.1 Procedure

An MCC will process ship security alerts (beacon message bits 37-40 = 1100) according to the logic provided in Figure III / B.9. Routing of ship security alerts will be based on the country code contained in the beacon message, that is, the message will be transmitted to the MCC associated with the country code, and not transmitted to other MCCs, RCCs, or SPOCs based on the Doppler locations or encoded position contained in the beacon message. Message routing for ship security alerts will follow the data distribution matrix as provided at Figure III / A.8. Ship security message will be exchanged between MCCs using the formats and data content for alert messages as contained in document C/S A.002 (SD).

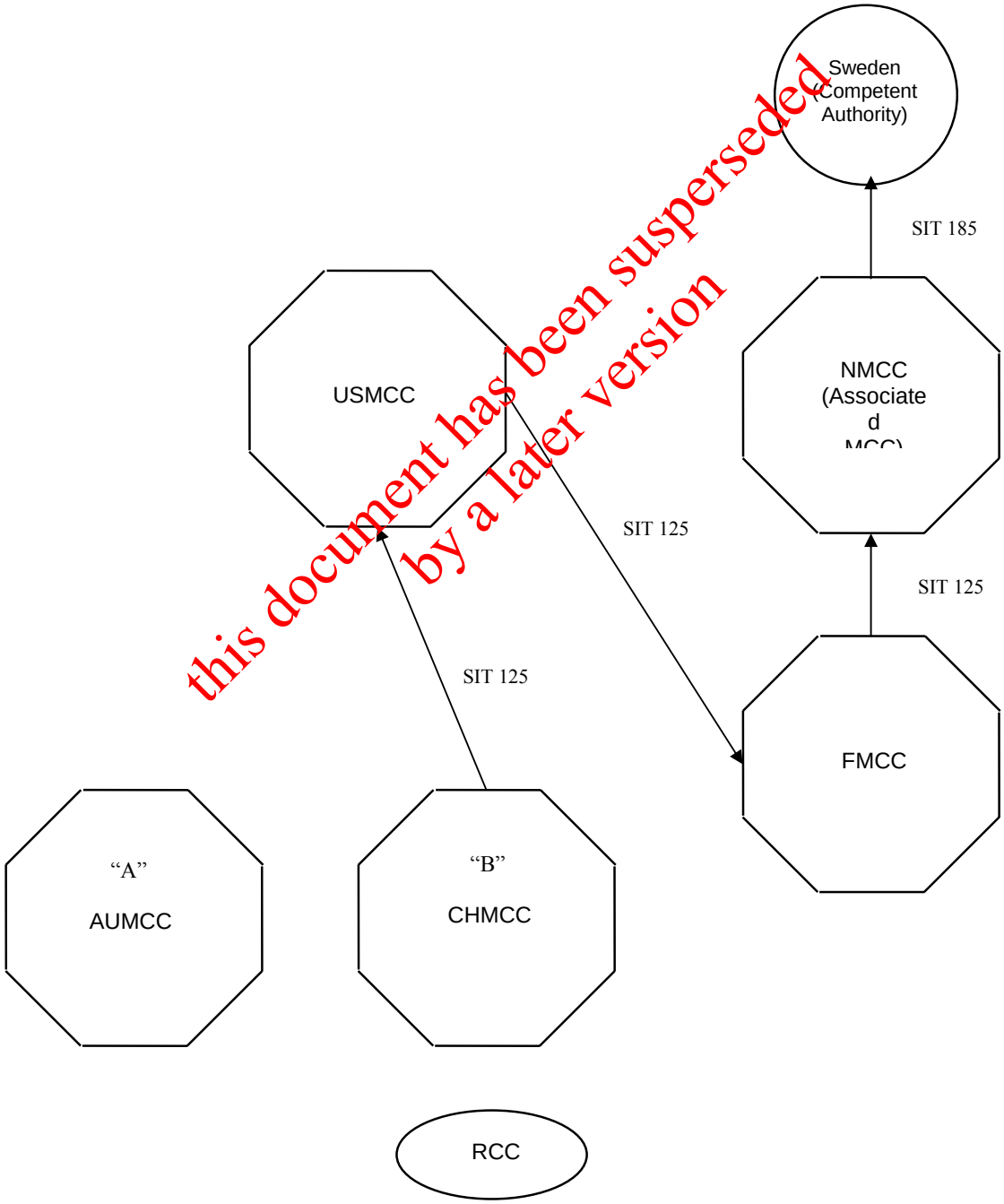
When a ship security alert is received by the Associated MCC, that MCC will notify the relevant competent security authority as provided by IMO or another appropriate point of contact as previously arranged.

MCCs will continue to transmit the appropriate alert messages until ambiguity is resolved, except for the Associated MCC which will continue to provide information to the competent authority on all additional "beacon events" after ambiguity resolution.

III / B.8.2 Ship Security Alerts Examples

Scenario

Country code in Beacon ID: Sweden (265)
Initial Alert with Doppler Location
"A" Position Service Area: AUMCC (Australian MCC)
"B" Position Service Area: CHMCC (Chilean MCC)
Receiving MCC: CHMCC



Scenario

Country code in Beacon ID: Panama
Initial Alert with Encoded Position
Encoded Position Service Area: SPMCC (Spanish MCC)
Receiving MCC: SPMCC

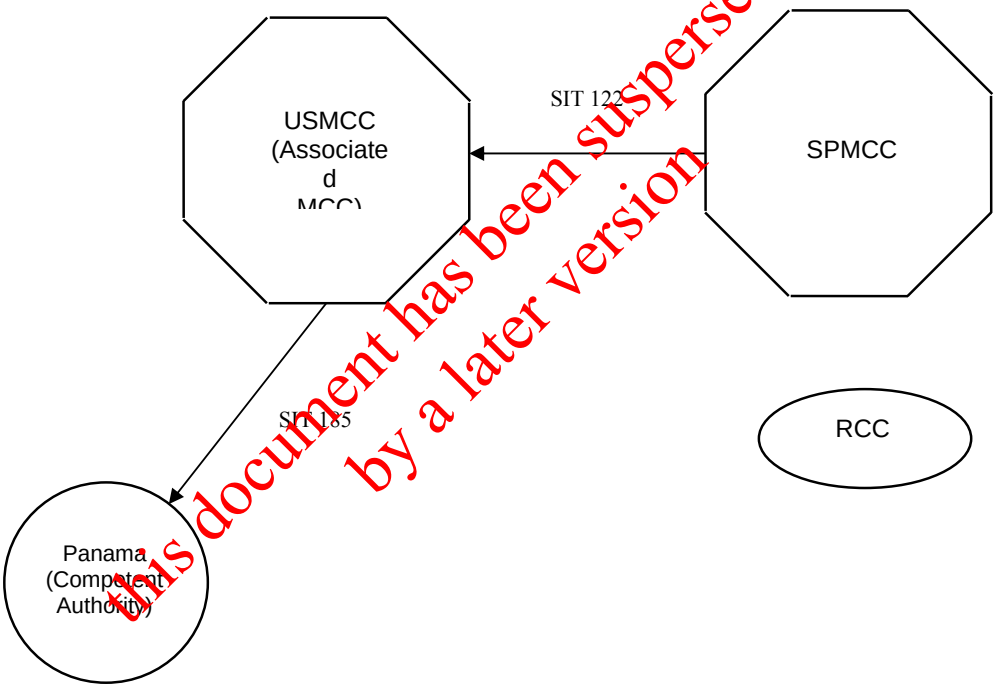


Figure III / B.9 : Processing Matrix, Message Formats and Distribution of 406 MHz Ship Security Alerts

	I_1 (no position data)			I_2 (A / B Doppler positions)			I_3 (Encoded only)			I_4 (A / B / E unmatched)			I_5 (Resolved Doppler)			I_6 (Res. D + E unmatched)			I_7 (Resolved D and E)		
	Aw	SIT	Dest	Aw	SIT	Dest	Aw	SIT	Dest	Aw	SIT	Dest	Aw	SIT	Dest	Aw	SIT	Dest	Aw	SIT	Dest
Sw_0	Aw_1	122	C	Aw_2	125	C	Aw_3	122	C	Aw_4	126	C	Aw_5	127	C	Aw_6	127	C	Aw_7	127	C
Sw_1	Aw_0	-	-	Aw_2	125	C	Aw_3	122	C	Aw_4	126	C	Aw_5	127	C	Aw_6	127	C	Aw_7	127	C
Sw_2	Aw_0	-	-	Aw_5	127	C	Aw_7	124	C	Aw_7	127	C									
				Aw_0	-	-	Aw_4	123	C	Aw_6	127	C	Aw_5	127	C	Aw_6	127	C	Aw_7	127	C
				Aw_2	126	C				Aw_4	126	C									
Sw_3	Aw_0	-	-	Aw_7	127	C	Aw_0	-	-	Aw_7	127	C	Aw_7	127	C	Aw_7	127	C	Aw_7	127	C
				Aw_4	126	C	Aw_3	123	C	Aw_4	126	C	Aw_6	127	C	Aw_6	127	C			
Sw_4	Aw_0	-	-	Aw_7	127	C	Aw_7	124	C	Aw_7	127	C	Aw_7	127	C	Aw_7	127	C	Aw_7	127	C
				Aw_6	127	C	Aw_0	-	-	Aw_6	127	C	Aw_6	127	C	Aw_6	127	C			
				Aw_0	-	-	Aw_4	123	C	Aw_0	-	-									
				Aw_4	126	C				Aw_4	126	C									
Sw_5 Sw_6 Sw_7	Ct_0	-	-	Ct_0	-	-	Ct_0	-	-	Ct_0	-	-	Ct_0	-	-	Ct_0	-	-	Ct_0	-	-
				Ct_2	126	C	Ct_3	123	C	Ct_4	126	C	Ct_5	127	C	Ct_6	127	C	Ct_7	127	C
				Ct_5	127	C	Ct_7	124	C	Ct_7	127	C									

Notes:
I_i = Input
Sw_i = Status word
Aw_i = Action word
Ct_i = Continue transmission
C = Country code destination
Dest = Destination of SIT message
SIT = Subject Indicator Type / (standard message format)

III / B.9 PROCESSING AND DISTRIBUTION OF 406 MHz INTERFERENCE DATA

III / B.9.1 406 MHz Interference Data Processing

When processing 406 MHz interference data, the matching of interferer solutions is based strictly on location, with a 100 km criterion. In addition, the thresholds for closing interferer sites, 72 hours without new data or 20 missed passes, takes into account the fact that interferers often do not transmit continually.

III / B.9.2 406 MHz Interference Data Distribution

MCCs exchange 406 MHz interference data in the SIT 121 message format. MCCs shall automatically distribute 406 MHz interference data to other MCCs only when ambiguity is resolved, based on the location of the interferer. MCCs shall send at least two messages to other MCCs for each interferer site.

- END OF ANNEX III/B -

ANNEX III / C

PROCEDURES FOR THE CO-ORDINATION OF BEACON TESTS

Section 3.8 of C/S A.001 defines the principles governing the implementation of tests using beacons coded with operational protocols or beacons coded with the Test User Protocol. The following procedures should be implemented by the MCC responsible for the test for co-ordinating the requirements of the test with all affected MCCs. This procedure does not apply to international exercises co-ordinated through the Cospas-Sarsat Joint Committee.

The co-ordination shall consist of an advance submission of a narrative message shown in Figure III / C.1. The extent of required co-ordination will depend on beacon protocol (operational or test) and the number of beacons used, as shown in Table III / C.1. Upon deactivation of the last beacon, the MCC responsible for the test shall also transmit a narrative end-of-test message to all MCCs from which data has been requested.

The Beacon ID must conform to the definition given in the Cospas-Sarsat Glossary (C/S G.004).

Figure III / C.1 : Beacon Test Co-ordination Message

SIT 915 <NARRATIVE MESSAGE>

DATE: DD MM YY
FM: MCC SUPPORTING THE 406 MHz TEST
TO: ALL AFFECTED MCCs
SUBJ: BEACON TEST

A. TEST OBJECTIVE:

B. TEST DESCRIPTION:

C. LOCATION OF TEST:

D. DATE, TIME AND DURATION OF TEST:

E. BEACON ID (15 CONTIGUOUS HEXADECIMAL CHARACTERS):

F. SPECIAL DATA COLLECTION AND PROCESSING REQUIREMENTS:

G. POINT OF CONTACT
NAME:
LOCATION:
TELEPHONE NO:
AFTN NO:
TELEX NO:
FACSIMILE NO:

Table III / C.1: Notification Time Requirement for Submission of Co-ordination Information Indicated in Figure III / C.1

Number of Beacons Used	Messages Required	Beacon Protocol	
		Operational	Test
1 -3	Initial Notification	As soon as practical	Not required
	Second Notification	24 hours prior to the activation of the first beacon *	Not required
	End-of-Test Notification	Upon deactivation of the last beacon as required	Not required
maximum 6	Initial Notification	30 days prior to the date of the test	30 days prior to the date of the test
	Second Notification	24 hours prior to the activation of the first beacon *	24 hours prior to the activation of the first beacon *
	End-of-Test Notification	Upon deactivation of the last beacon as required	Upon deactivation of the last beacon as required

Note: * This set of information will be an update, if necessary, of the original set.

- END OF ANNEX III / C -

ANNEX III / D

ORBIT VECTOR UPDATE METHOD

There are three methods for LUT orbit vector updates for each Cospas-Sarsat satellite: use of the downlink signal, use of orbitography beacon information and use of orbit vector data supplied by an MCC. Which method offers the more accurate orbit vector determination for a given satellite pass depends on the satellite's SAR instrument status and how often orbit vectors are available at the LUT from the MCC.

If the SAR instrument status of a satellite is such that any of the three update methods can be used, the preferred update method is through orbitography beacons. Table III / D.1 provides guidelines for each satellite with the update methods listed such that the preferred method is number 1.

Table III / D.1 : Orbit Vector Update Method

Satellite	Orbit Vector Update Method
Sarsat-7, Sarsat-8, Sarsat-9, Sarsat-10, Sarsat-11 and Sarsat-12	1. Orbitography 2. MCC Provided Orbit Vectors 3. Downlink

- END OF ANNEX III / D -

- END OF PART III -

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