United States Mission Control Center (USMCC)
National Rescue Coordination Center (RCC) and
Search and Rescue Point of Contact (SPOC)
406 MHz Alert and Support Messages

27 February 2026
Version 5.3

DOCUMENT HISTORY

Version	Date	Description of Key Changes
1.0	01/01/99	Initial version
2.0	03/12/13	Removed references to 121 MHz processing; removed redundant field descriptions; enhanced descriptions of data fields and data distribution procedures; updated sample messages
3.0	08/06/15	Updated manual for MEOSAR data
4.0	11/16/22	Updated manual for new beacon types ELT(DT)s (15-hex first-generation beacons) and 23-hex second-generation beacons, and for the replacement of the term "Confirmed Position" with "MCC Reference Position"
5.0	07/24/23	Updated manual for new statement indicating IHDB records found for activated beacons, new MID codes for EPIRBs, and clarification of changes related to ELT(DT) and SGB processing
5.1	09/21/23	Updated Table 3.2.9 to include LEO and GEO satellite codes used in RCC messages
5.2	09/16/24	Updated Section 3.4.7 to point to C-S web page for registration contacts
5.3	02/27/26	Updated information throughout the manual to reflect the expansion of PLB registrations to include vessel and aircraft data and the addition of an Iridium number field for EPIRB and SSAS registrations. Updated satellite references in Table 3.2.9. Updated Annex 12 to match current IHDB fields.

Quick Reference Guide to Changes

Version 5.3 (27 February 2026)	
Section	**Principal Change**
1.1	UPDATE: Replaced Figure 1.1 with current overview graphic from C-S website.
2.1.1	UPDATE: Removed reference to 2023 operational date for ELT(DT)s and SGBs
Table 3.2.7	UPDATE: Removed reference to 2023 in Table 3.2.7 note
3.4.2.1	NEW: Added new field for IRIDIUM NUMBER
3.4.2.2	UPDATE: Replaced "REGISTRATION NO (which may contain a tail number)" with TAIL NUMBER
3.4.2.3	NEW: Added new fields for PLB registrations: VESSEL NAME, HOME PORT, AIRPORT, and TAIL NUMBER
4.1.1	UPDATE: Removed statement in note related to old PLB registration limitation and updated example to include new fields
4.1.2	UPDATE: Updated example to replace REGISTRATION NO. with TAIL NO. and added ALTERNATE AIRPORT field
4.1.3	NEW: Added IRIDIUM NUMBER to example
4.2.2	NEW: Added new fields VESSEL NAME, HOME PORT, AIRPORT, and TAIL NO to example
4.9.2	NEW: Added IRIDIUM NUMBER to example
Annex 1	UPDATE: Added definitions for existing fields ALTERNATE AIRPORT and ALTERNATE PORT; updated definition for BEACON CONTAINS SVDR; added term and definition for new field IRIDIUM NUMBER; updated HOME PORT and HOME PORT PRIMARY SRR definition to add PLB; updated MMSI NUMBER definition to add PLB; updated RADIO EQP definition to include Iridium number; updated REGISTRATION NO definition to add PLB; added TAIL NO term and its definition; updated TEL # definition to remove FAX and OTHR options; updated VESSEL NAME definition to add PLB
Annex 3	UPDATE: Updated url for MCC list on C-S website
Annex 5	UPDATE: Replaced REGISTRATION NO with TAIL NO in ELT example; added IRIDIUM NUMBER to EPIRB example; added HOME PORT, AIRPORT, and TAIL NO to PLB example
Annex 8	UPDATE: Added HOME PORT, AIRPORT, and TAIL NO to example
Annex 12	UPDATE: Updated field descriptions throughout table to match current IHDB; changed field name ACTIVATION COMMENT to CASE SUMMARY

Version 5.2 (16 September 2024)	
Section	**Principal Change**
3.4.7	UPDATE: Updated Section 3.4.7, which addresses non-USA-coded beacons. A message will now provide the url for the C-S web page containing contact information for all beacon registries, where the RCC/SPOC can find the most up-to-date registration POCs for all country codes
Version 5.1 (21 September 2023)	
Section	**Principal Change**
3.2.3.6	UPDATE: Table 3.2.9 now provides satellite codes used in RCC messages
Annex 1	UPDATE: Clarified SAT term definition description
Version 5.0 (24 July 2023)	
Section	**Principal Change**
3.2.3.9	UPDATE: The best new solution is sent for an ELT(DT) every 10 minutes
3.2.7	UPDATE: Subsequent MEOSAR alert from a single satellite and burst provides corroboration if at least one alert was from a MEOLUT that does not receive antenna data from any other MEOLUT
3.3.1	NEW: Information for new MIDs allocated for EPIRBs in RCC messages
3.3.9	NEW: Message statement added indicating IHDB records found for activated beacons
3.4	UPDATE: Empty beacon registration fields may be excluded from the RCC message
6.2.7	NEW: Information for new MIDs allocated for EPIRBs in SPOC messages
Annex 3	UPDATE: Identify FGB ELT(DT) and SGB-capable MCCs

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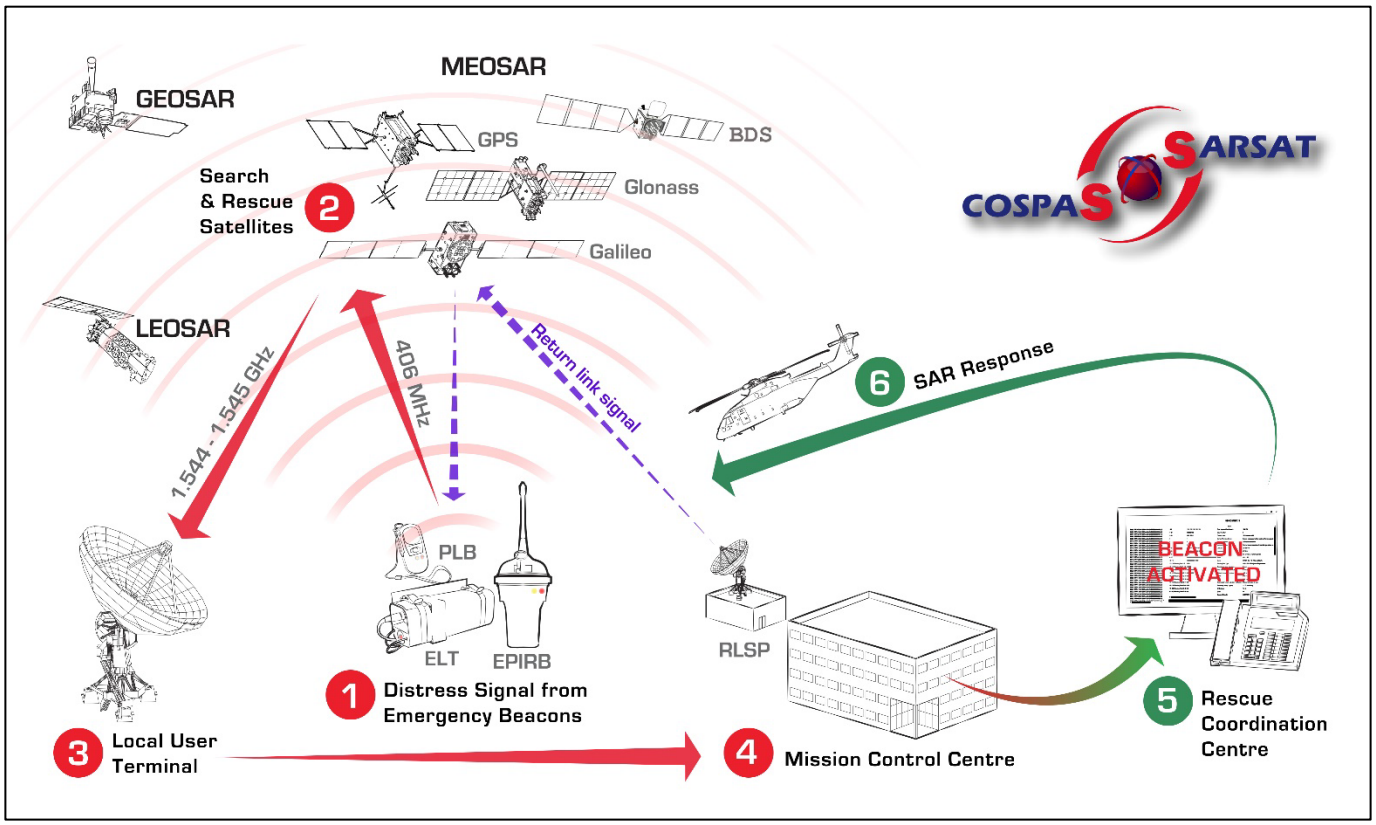
LIST OF ANNEXES

1 INTRODUCTION

1.1 Overview of Cospas-Sarsat

The purpose of the Cospas-Sarsat (C/S) 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 radio beacons operating on 406 MHz. Signals from radio beacons are transmitted to low-earth orbiting (LEO), medium-earth orbiting (MEO) or geo-stationary (GEO) orbiting satellites. The signals are then relayed to earth ground stations called Local User Terminals (LUTs) and eventually to Mission Control Centers (MCCs). As the center for Cospas-Sarsat operations in the United States, the United States Mission Control Center (USMCC) collects and processes data from national LUTs and foreign MCCs. The USMCC then distributes alert data to national Rescue Coordination Centers (RCCs), SAR Points of Contact (SPOCs), and foreign MCCs. Figure 1.1 presents an overview of the Cospas-Sarsat System.



Source: https://cospas-sarsat.int/en/search-and-rescue/system-graphics-en

Figure 1.1: Overview of the Cospas-SARSAT SystemDocument Objective

This document describes messages that are transmitted by the USMCC to national RCCs and SPOCs for the LEOSAR/GEOSAR/MEOSAR (LGM) system, which began operations on 13 December 2016. Prior to this date, the USMCC sent messages for the LEOSAR/GEOSAR (L/G) system. This document also describes messages transmitted by the USMCC to national RCCs and SPOCs for Distress Tracking ELTs [ELT(DT)s] and Second-Generation Beacons (SGBs).

National SAR authorities should use this document to respond to alerts generated by 406 MHz distress beacons. Unless otherwise noted, this document only describes USA (nationally formatted) messages. USA nationally formatted messages are sent to all USA RCCs and some USA SPOCs (that is, some foreign SPOCs within the United States service area). The SPOCs that receive nationally (RCC) formatted messages are identified in Annex 7.

SPOCs that do not receive the nationally formatted messages sent to all USA RCCs are sent Subject Indicator Type (SIT) 185 messages as described in Section 6.

1.3 Reference Documents

More information on the alert message data elements and components of the SARSAT system can be found in the following documents:

a) United States Mission Control Center Data Structures
b) C/S A.001, Cospas-Sarsat Data Distribution Plan
c) C/S A.002, Cospas-Sarsat Mission Control Centres Standard Interface Description
d) C/S A.003, Cospas-Sarsat System Monitoring and Reporting
e) C/S A.005, Cospas-Sarsat Mission Control Centre (MCC) Performance Specification and Design Guidelines
f) C/S A.006, Cospas-Sarsat Mission Control Centre Commissioning Standard
g) C/S G.007, Handbook on Distress Alert Messages for Rescue Coordination Centres (RCCs), Search and Rescue Points of Contact (SPOCs) and IMO Ship Security Competent Authorities
h) C/S G.010, MCC Handbook
i) C/S P.011, Cospas-Sarsat Programme Management Policy
j) C/S R.018, Cospas-Sarsat Demonstration and Evaluation Plan for the 406 MHz MEOSAR System
k) C/S T.001, Cospas-Sarsat 406 MHz Beacon Specification
l) C/S T.002, Cospas-Sarsat LEOLUT Performance Specification and Design Guidelines
m) C/S T.005, Cospas-Sarsat LEOLUT Commissioning Standard
n) C/S T.007, Cospas-Sarsat 406 MHz Distress Beacons Type Approval Standard
o) C/S T.009, Cospas-Sarsat GEOLUT Performance Specification and Design Guidelines
p) C/S T.010, Cospas-Sarsat GEOLUT Commissioning Standard
q) C/S T.012, Cospas-Sarsat 406 MHz Frequency Management Plan
r) C/S T.015, Cospas-Sarsat Specification and Type Approval Standard for 406 MHz Ship Security Alert (SSAS) Beacons
s) C/S T.018 Cospas-Sarsat Specification for Second-Generation Cospas-Sarsat 406-MHz Distress Beacons
t) C/S T.019, Cospas-Sarsat MEOLUT Performance Specification and Design Guidelines
u) C/S T.020, Cospas-Sarsat MEOLUT Commissioning Standard
v) C/S T.021, Cospas-Sarsat Second-Generation 406-MHz Distress Beacons Type Approval Standard

The documents listed below are available from the International Maritime Organization (www.imo.org) or the International Civil Aviation Organization (www.icao.int) for a fee:

w) Doc 9731 – AN/958 - International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual and the corresponding National SAR Supplement
x) Doc 8585 – "Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services"
y) Doc 10054 – "Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery"
z) Doc 10165 – "Manual on Global Aeronautical Distress and Safety System (GADSS)"

C/S documents (e.g., C/S A.001) are available on the System Documents page of the C/S professionals website and are typically updated on an annual basis between October and December.

The USA Beacon Coding Guide describes the allocation of national use protocols for USA-coded beacons, as managed by NOAA, and its distribution is limited.

This document (USMCC National RCC and SPOC Alert and Support Messages) is available online via the NOAA SARSAT Program & System Documentation page.

2 SUMMARY OF MESSAGES

The USMCC sends alert messages and support messages to USA RCCs, as described below. Uppercase letters (e.g., SAT) are used to indicate a field name as it appears on a message.

2.1 Alert Message Overview

The data available at the MCC for beacon alerts includes, but is not limited to the following:

- time of closest approach (TCA) (Doppler location only) or time of detection (DETECT TIME);
- satellite identifier(s);
- frequency of transmitter;
- number of detections (beacon bursts* for LEOSAR and GEOSAR data);
- duration of Doppler curve (Doppler location only);
- probability of the "A" solution being correct (Doppler location only);
- error ellipse;
- confidence factor;
- expected horizontal error (Difference of Arrival (DOA) location only);
- cross-track angle (Doppler location only); and
- data residuals.

**A burst is a transmitted beacon message. As specified in document C/S T.001, bursts for operational First-Generation Beacons (FGBs), except for Distress Tracking ELTs (ELT(DT)s) are transmitted with a period randomized around a mean value of 50 seconds, so that time intervals are randomly transmitted on the interval 47.5 to 52.5 seconds. Document C/S T.018 provides specifications for Second-Generation Beacons (SGBs). FGBs and SGB ELT(DT)s transmit every 5 seconds in the first 120 seconds after beacon activation to ensure that a current beacon position data is available in the event that the associated aircraft, assumed to be fast-moving, crashes soon after beacon activation.*

A limited data set is transmitted to RCCs, based on what is useful to the RCC Controller. The following data is provided for each emergency beacon signal:

Alert Data

- **WHAT** kind of alert message the USMCC is sending;
- **WHEN** the satellite received the beacon signal;
- **WHERE** the beacon is located (if known);
- **WHAT** beacon ID transmitted the signal.

Supporting Data

- **WHO** received or is receiving alerts for this beacon;
- **WHEN** the beacon was previously detected;

2.1.1 Alert Message Types

Table 2.1 provides a brief description of the alert messages generated by the USMCC for RCCs. The message name is shown in uppercase letters, as it appears on the alert message. The Subject Indicator Type (SIT) is also provided on the alert message, as described in Section 3.1.

Described further in Table 2.1, SIT 170 – 179 messages are provided for FGBs, and SIT 370 – 379 messages are provided for SGBs, where FGBs are specified in document C/S T.001 and SGBs are specified in document C/S T.018. SIT 170 – 179 messages are quite similar to SIT 370 – 379 messages; for example, an unlocated first alert is sent as a SIT 170 message for a FGB and as a SIT 370 message for an SGB. *NOTE: The newest beacon types are ELT(DT)s (i.e., Distress Tracking ELTs) and SGBs; an ELT(DT) may be either an FGB or an SGB.*

As described further in Section 3.2.2.1, position confirmation is the process by which the MCC attempts to determine the actual beacon position, based on the match of two positions for a beacon from independent sources that match within 20 kilometers. While the SIT number often indicates if position is confirmed, as described in Table 2.1, the presence of the "MCC Reference Position" (an MCC estimation of the beacon position) indicates that position is confirmed, and conversely, its absence indicates that the position is not confirmed. The term "MCC Reference Position" is used instead of the legacy term "Confirmed Position," so that SAR personnel do not assume that this reported position is the actual beacon position. Note that Doppler position is not provided for FGB ELT(DT)s or SGBs.

Table 2.1: Description of Alert Messages

SIT	Message Name/Comments
170 370	**406 BEACON UNLOCATED FIRST ALERT** This message is sent when a 406 MHz beacon (with registration information or craft identification) is first detected but no encoded, DOA, or Doppler position information is available. This message is usually sent when a beacon signal is detected first by a geostationary satellite. Section 3.2.3.8.2 describes distribution procedures for unlocated alerts. This message is sent only before position is confirmed.
171 371	**406 BEACON INITIAL LOCATED ALERT** This message is sent when a 406 MHz beacon is first detected with encoded, DOA, or Doppler position information available, but the position is not confirmed. Section 3.2.3.8.2 describes distribution procedures for alerts with DOA position.

SIT	Message Name/Comments
172 372 1)* 2) 3) 4)	**406 BEACON POSITION UPDATE** This message is sent prior to position confirmation when: 1) an alert with Doppler location was previously sent and updated information regarding the A/B probability is available for the same satellite pass indicating that the "A" side probability in the new solution is at least 15% higher than the "A" side probability in all previously sent same pass solutions; 2) the new Doppler alert indicates that one Doppler position is an image (incorrect); 3) the new DOA position is "better quality" based on the Expected Horizontal Error; 4) the latest data time of a new DOA position is more than 5 minutes after the latest data time of all previously sent alerts with DOA position – non-ELT(DT); 5) the latest data time of a new DOA position is at least 3 seconds from the detect time of all other alerts (within the first 30 seconds of activation) or at least 10 minutes after the latest data time of all previously sent alerts with DOA position (after the first 30 seconds of activation) - ELT(DT)
172	**406 BEACON UNRESOLVED DOPPLER POSITION MATCH** This message is sent prior to position confirmation when an alert with Doppler location was previously sent and both Doppler locations for a new satellite pass match the Doppler locations for a previous pass.
172 372	**406 BEACON DOA POSITION MATCH** This message is sent when an alert for an ELT(DT) contains DOA and encoded positions that match. Position data from previous alerts is not referenced in subsequent alerts for ELT(DT)s. Position is not confirmed for ELT(DT)s, which are assumed to be fast-moving.
173 373	**406 BEACON POSITION CONFLICT ALERT** This message is sent, prior to position confirmation, when DOA, Doppler, or encoded positions for a 406 MHz beacon differ by more than 20 kilometers from another position for the beacon. This indicates that at least one of the positions is inaccurate.
174 374	**406 BEACON INITIAL LOCATED ALERT** This message is sent when a DOA or Doppler position is confirmed by an encoded position in the new alert that matches within 20 kilometers, and no previous alert was sent with a position for the beacon.
174 374	**406 BEACON POSITION UPDATE** This message is sent when a DOA or Doppler position is confirmed by independent DOA, Doppler, or encoded position data that matches within 20 kilometers, and position data was previously received for the beacon.

This is a USA national message only; it is not specified by Cospas-Sarsat.

SIT	Message Name/Comments
175 375	**406 BEACON POSITION UPDATE** This message is sent after position confirmation when the new Doppler or DOA position is within 20 kilometers of the previous MCC Reference Position. A subsequent alert with DOA position is sent based on a difference of at least 15 minutes in the time of the latest bursts in the new alert vs. the previously sent alerts with DOA position or the new DOA position is "better quality" based on the Expected Horizontal Error; see Section 3.2.3 for details. **406 BEACON POSITION CONFLICT ALERT** This message is sent after position confirmation when: 1) the new Doppler or DOA positions differ by more than 20 kilometers from the MCC Reference Position; 2) the new encoded position differs by more than 20 kilometers from the MCC Reference Position, if there is no previous encoded position for the alert site; 3) the new encoded position differs by more than 20 kilometers from previous encoded position, if there is previous encoded position for the alert site.
176* 376*	**406 BEACON SITE STATUS REPORT** This message is sent when no message has been sent for a beacon within 35 minutes, or when an alert site closes due to age-out or USMCC Operator action. An alert site closes if the beacon is not detected within 2 hours, if the beacon was detected by a MEOLUT with DOA position or by a GEOLUT, or 6 hours otherwise. In addition, an alert site closes if the beacon is not detected within 15 minutes of the detection of a user cancellation message. An alert site also closes if it has been open for 36 hours. This message may be sent before or after position is confirmed.
177* 377*	**406 BEACON DETECTION UPDATE** This message is sent when a 406 MHz alert is received with the (last) detect time at least 30 minutes later than the most recent detect time sent to the RCC for the alert site, or when a new alert is received and an uncorroborated MEOSAR alert was the only alert distributed for the alert site. For an ELT(DT), this message is sent when the latest data time in a new alert without position is at least 3 seconds from the detect time of all other alerts, within the first 30 seconds of activation. This message is only sent for alerts that lack new position data that otherwise causes the alert to be sent (e.g., if an alert is sent for position confirmation it would not also be sent as a Detection Update). This message may be sent before or after position is confirmed.
178 378	**NOTIFICATION OF COUNTRY OF REGISTRATION** This message notifies the country of registration (based on the country code in the 406 MHz beacon) that one of its beacons is first detected outside of its Search and Rescue Region (SRR). It is sent to a USA RCC when a USA-coded beacon is detected outside the USA SRR. It is also sent to the USA RCC responsible for the SRR of a foreign country when a 406 MHz beacon coded for that country is detected outside of that country's SRR. This message is distributed to a USA RCC based on the home port or airport for a registered USA beacon, based on the beacon type for an unregistered USA beacon or based on country code for a non-USA beacon. It may be sent when encoded position and either DOA or Doppler position from the same alert confirms position.

**This is a USA national message only; it is not specified by Cospas-Sarsat.*

SIT	Message Name/Comments
179 379	**406 BEACON ENCODED POSITION UPDATE** This message is sent when the Global Navigation Satellite System (GNSS) position encoded in the 406 MHz beacon message changes by more than 3 kilometers and less than 20 kilometers. It is also sent when the first refined (more precise) encoded (i.e., GNSS) position is received after a coarse encoded position is received (FGB only). It may be sent before or after position is confirmed. If the encoded position is received after position is confirmed, then the new encoded position is compared to the previous encoded position (if available), not the MCC Reference Position. For an ELT(DT), it is sent if the latest data time for a new encoded position is at least 3 seconds from the detect time of all other alerts (within the first 30 seconds of activation) or at least 10 minutes after the latest data time of all previously sent alerts with encoded position (outside the first 30 seconds after activation). This message provides SAR forces with timely updates on beacon position, which may be particularly valuable in difficult SAR conditions such as rough seas or mountainous terrain, or when a fast-moving aircraft crashes with an ELT(DT) on board. This message is usually sent when DOA or Doppler location is not available. If the magnitude of the encoded position change is between 3 and 20 kilometers and new (i.e., non-redundant) DOA or Doppler position data is available, then the message type (SIT number) will be based on the new DOA or Doppler position data. Note: It is expected that "GNSS Position" will replace "Encoded Position" in this message title once the USCG SAROPS has been updated to recognize the new message title. **406 BEACON USER CANCELLATION** This message is sent when the user cancels the beacon activation, as evidenced by the MCC receipt of three different cancellation messages from the beacon within 110 seconds with no intervening non-cancellation alert messages. This message is only sent for SGBs and FGB ELT(DT)s. The transmission of a user cancellation message does not cause the alert site to close immediately; see the description of the SIT 176 and 376 messages. This message may be sent before or after position is confirmed. **406 BEACON ROTATING FIELD UPDATE ALERT** This message is sent when the rotating field in the SGB message updated and either the first alert is processed for a specific rotating field data type or the associated detect time of the new alert is at least 10 minutes later than the most recent detect time for a previously sent alert containing data for the same rotating data field type; this message is only sent when the alert is not sent for another reason, such as the presence of new position data. This message may be sent before or after position is confirmed. This message is not sent for FGBs.

2.1.2 Alert Message Structures

Alert messages are structured to present data in a logical, consistent format. Table 2.2 describes the structure of the alert messages, with a list of key fields provided in parentheses. Sample alert messages are provided in Section 4.

Table 2.2: Alert Message Structure Message Header

(message number, transmit time, message type)
Alert Data Block (406 MHz Beacon ID, Site ID, alert position, detect time)
406 MHz Beacon Decode Information (Country of Registration, Beacon type, Craft ID)
406 MHz Beacon Registration Data (Beacon owner, contact information, vehicle/usage information) (For non-USA beacons: Beacon Registry contact information)
Supporting Information (Alert recipients, previous detections)
Incident Feedback Request (Requests RCC feedback on resolution of beacon activation)
Message Trailer (formal end of message)

A detailed description of these message sections is provided in Section 3. Other conditions pertinent to alert message content and distribution are described in Sections 2.1.3 through 2.1.6.

2.1.3 406 MHz Beacon Message Overview

406 MHz FGBs transmit either 112 bits (short message) or 144 bits (long message). Except for ELT(DT)s, operational FGBs transmit every 50 seconds ± 2.5 seconds. The first 24 bits are used by receiving equipment at the satellite and the LUT (ground station) to identify the signal as coming from a 406 MHz beacon. The remaining 120 bits (bits 25 – 144) in the long message, also known as the "beacon message," are normally represented by 30 hexadecimal characters* and identify the beacon in LUT-to-MCC and MCC-to-MCC communications. The remaining 88 bits of the short message, bits 25 – 112, are zero-filled on the right to form the standard 30-hexadecimal character ID exchanged by MCCs. Components of the FGB message are described in document C/S T.001.

The 406 MHz SGB message consists of 250 bits, of which 48 bits are within a rotating field type. The use of a rotating field expands the amount of information that can be provided in the beacon message, by including certain kinds of information in one rotating field type and other kinds of information in another rotating field type. SGBs have a fixed identification consisting of Type Approval Certificate (TAC) number and serial number that is independent of the vessel or aircraft identification information that may be encoded in the beacon message. Every SGB message has a unique 23-hex ID that includes the country of beacon registration. Components of the SGB message are described in document C/S T.018.

Compared to the FGB message, the additional bits in the SGB message enable additional information to be provided, including a more precise encoded (i.e., GNSS) position and the time that this position was updated. An SGB transmits more frequently soon after activation to help ensure that reliable position information is available in a timely manner, and transmits less frequently later during the activation as a means to conserve the beacon's battery capacity.

Both FGB and SGB ELT(DT)s transmit every 5 seconds in the first 120 seconds after activation, and less frequently afterwards. ELT(DT)s start transmitting no more than 5 seconds after activation. All ELT(DT)s have a cancellation function, whereby activation of an ELT(DT) can be cancelled by the same means by which it was initiated. A portion of the FGB ELT(DT) beacon message includes a rotating field, where some transmissions include the three-letter aircraft designator (3LD) and other transmissions include a more precise GNSS location.

** A hexadecimal or "hex" character has 16 possible values, where symbols 0-9 represent values zero to nine and letters A-F represent values ten to fifteen.*

2.1.4 Alert Messages with an Unreliable 406 MHz Beacon Message

A 406 MHz FGB or SGB message is determined to be unreliable when it fails a validation check as specified in document C/S A.001; for example, if the country code is invalid or the primary (first) error detection code encoded in the FGB message is invalid.

The USMCC distributes alerts with unreliable 406 MHz beacon messages based only on:

a) The MEOLUT-computed DOA location or LEOLUT-computed Doppler location (if available), or
b) Data in the USA Registration Database (if the beacon ID is registered, and DOA or Doppler location is not available).

An alert message with an unreliable beacon message is not distributed if there is no DOA or Doppler location and the beacon ID is not registered in the USA Registration Database.

An unreliable beacon message may be caused by a problem with the beacon, the satellite, the LUT, the MCC, or communications to the MCC. An unreliable beacon message may also be caused by a miscoded beacon. Whatever the cause, the absence of a reliable (i.e., usable) beacon message does not imply that the associated DOA or Doppler location is unreliable or that the 406 MHz alert was transmitted in a non-distress situation.

Alerts with an unreliable 406 MHz beacon message and a reported DOA or Doppler location in the USA SRR are sent to a USA RCC based on location. In addition, these alerts are sent to the US Coast Guard (USCG) Atlantic Area (LantArea), USCG Pacific Area (PacArea), and the USA Competent Authorities for Ship Security Alert System (SSAS) alerts, because the associated beacon message may have been transmitted by an SSAS beacon. Section 2.1.5 further describes SSAS beacon alerts.

When the 406 MHz beacon message is unreliable, the RCC alert message includes an additional header line saying "UNRELIABLE BEACON (HEXADECIMAL) ID," which immediately precedes the

standard message title, as shown in the sample alert message in Section 4.2.3. No fields in the 406 MHz beacon message are decoded in the RCC message when the beacon message is unreliable, as described in Section 3.3.8.

If the MCC receives a new alert with an unreliable beacon message after it receives an alert with a reliable beacon message for the same beacon (based on a match of the 15-digit hexadecimal beacon ID for an FGB or the 23-digit hexadecimal beacon ID for an SGB), then the new alert will be linked to the previous alert (i.e., added to the same alert site) and sent using beacon message information in the reliable beacon message.

2.1.5 Alert Messages for SSAS Beacons

Alert messages for 406 MHz SSAS beacons are sent to the designated competent authority based on the country encoded in the 406 MHz FGB ID, in accordance with Cospas-Sarsat specifications in C/S documents T.001, T.015, A.001, and A.002.

If the competent authority (message destination) for a SSAS alert is a USA RCC or a USA SPOC (i.e., a country in the USA Service Area but not in the USA Search and Rescue Area) that receives alert messages in RCC format, then the message has the same format as other RCC messages, except that a header line stating “SHIP SECURITY ALERT” is included. This header line immediately precedes the standard message title. SSAS alerts are normally sent only to the designated competent authority.

For USA SPOCs that are not sent alert messages in RCC format, the USMCC sends SSAS alert messages in SIT 185 format, as specified in and in Section 6 and in document C/S A.002.

2.1.6 Alert Messages Sent During USMCC Backup

If the USMCC is unavailable, the Canada MCC (CMCC) will provide alert data to USA RCCs and SPOCs in Cospas-Sarsat standard format SIT 185, as described in document C/S A.002. Some important differences between alert (SIT 185) messages sent by the CMCC and alert (SIT 170 to 179) messages sent by the USMCC are noted below.

a) SIT 185 messages sent by the CMCC do not contain a site ID. Use the 15-digit FGB ID (field “CMCC REF” in Line “2”) to associate different messages for the same beacon activation. View the Message Title (Line 1) to help determine if a new site was opened for a given beacon ID.

Use the beacon ID and activation time to update the USMCC Incident History Database (IHDB). The IHDB may not be available (or may not contain information on a specific beacon activation), depending on the USMCC failure.

b) CMCC personnel cannot close alert sites.

c) SIT 185 messages sent by the CMCC do not contain registration data for USA beacons, since the CMCC software does not have access to the USMCC Beacon Registration Database (RGDB). In addition, CMCC personnel do not have access to the USMCC RGDB. The USA RCC should query the USMCC RGDB manually for registration information about USA beacons. The RGDB may not be available, depending on the USMCC failure.

d) Since the CMCC does not have access to the USMCC RGDB to determine if a beacon is registered, the CMCC sends SIT 185 unlocated alerts for all serialized USA beacons. In contrast, the USMCC sends unlocated alerts for serialized USA beacons only if the beacon is registered or contained in a USA special program.

e) The CMCC sends all SIT 185 unlocated alerts for USA beacons to the AFRCC.

f) Next Pass Times (SIT 185, Line 10*) are generally provided based on mutual visibility of the satellite to Canadian LEOLUTs and the reported beacon location. The CMCC may also provide next pass times based on information received from the AUMCC for non-Canadian LEOLUTs (annotated on the message as “FOREIGN LUT”). Alert messages sent by the USMCC do not provide next pass information.

g) The CMCC specially routes all alerts for USA-coded “national use” beacons to the AFRCC in addition to routing the alerts based on location, whereas the USMCC specially routes USA-coded “national use” beacons that are allocated to USA government “special programs” to specific destinations per special program (based on agreements made by NOAA/USMCC with other USA government agencies). In this context, the CMCC defines a USA country code to be in the range of 366 to 369, whereas the USMCC may perform special routing based on any USA country code listed in Table 3.2.11.

SIT 185 messages from the CMCC for USA national use beacons will contain the following information:

```
16. REMARKS:  USA CODED NATIONAL USE BEACON
```

h) The CMCC distributes unlocated alerts, Notifications of Country of Registration (NOCRs), and SSAS alerts for country codes for countries in the US service area per Annex 14, except that the CMCC send NOCRs and unlocated alerts to the AFRCC where “US RCC” is listed in Table 3.2.11.

i) The CMCC sends a maximum of 4 missed LEOSAR satellite missed pass messages per reported beacon location. The USMCC does not send missed pass messages but sends missed detection messages.

j) The CMCC message title “MIRROR NOTIFICATION” indicates that ambiguity associated with Doppler position data has been resolved and that the resolved (confirmed) position is not in the SRR of the message destination.

k) While the USMCC sends alerts for EPIRBs in the AFRCC SRR and within 50 km of a USCG SRR to the USCG RCC (not the AFRCC), the CMCC would send these alerts to the AFRCC and send to the buffer USCG RCC per normal CMCC distribution rules.

l) SIT 185 messages sent by the CMCC do not contain the two-line SIT message header that is sent by the USMCC.

m) The CMCC Operator cannot remove one destination (RCC) from the distribution list for an alert site without removing all destinations. This means if two RCCs are receiving data for a site and one of the RCCs wants their messages suppressed for the site, the CMCC Operator will not be able to suppress messages for the one RCC without suppressing the messages for the other RCC.

n) SIT 185 messages sent by the CMCC do not list the other message destinations, whereas the USMCC provides a list of message recipients in “Supporting Information”.

o) While the USMCC alert message includes the beacon registration data for the associated USA special program block registration ID when available, the CMCC cannot provide this information. As a result, USA RCC personnel will not be able to access the appropriate beacon registration data for USA special program beacons that have a block registration. See the section for “PROGRAM BLOCK REGISTRATION ID” in Section 3.

p) When the LGM CMCC (which is not yet operational) re-establishes the confirmed position (i.e., the MCC Reference Position) without reference to the previous confirmed position, it includes this text in the alert message:

```
CONFIRMED POSITION WAS REESTABLISHED WITHOUT REFERENCE TO THE PREVIOUS
CONFIRMED POSITION
```

When this occurs, and a new message destination is identified for subsequent alerts, the following text will be also be included in the alert message:

```
A NEW MESSAGE DESTINATION HAS BEEN IDENTIFED FOR THE NEW CONFIRMED POSITION.
SUBSEQUENT ALERTS WILL NO LONGER BE SENT TO THE PREVIOUS DESTINATION.
```

Note that the CMCC currently generates SIT 185 messages using the legacy term “Confirmed Position” instead of the new term “MCC Reference Position”.

Note that the USMCC may also re-establish the MCC Reference Position without reference to the previous MCC Reference Position (as described in Section 3.2.3.11), but the USMCC will not automatically change the message destination when this occurs.

q) The CMCC is not currently capable of distributing MEOSAR or SGB alerts. The CMCC does not recognize FGB ELT(DT)s, and thus distributes FGB ELT(DT) alerts as “unreliable beacon messages” based only on the Doppler location. If such a message originates from an FGB ELT(DT), any associated “Doppler positions” are likely to be unreliable due to the rapid aircraft motion. The 15-digit HEX ID in

the SIT 185 message may be decoded using an appropriate tool (e.g., https://cospas-sarsat.int/en/beacons-pro/beacon-message-decode-program-txsep/beacon-message-decode-program or https://cospas-sarsat.int/en/beacons-pro/beacon-message-decode-program-txsep/beacon-decode-all) to **help** determine if the unreliable beacon message is associated with an FGB ELT(DT).

In addition, the CMCC is not capable of generating SIT 185 messages in the re-organized format specified in document C/S A.002, which contains 6 numbered message sections (lines) instead of 15.

Sample SIT 185 messages from the CMCC are provided in Annex 4.

This section (2.1.6) will need to be updated as the CMCC is updated for the capabilities noted in item q.

* - *Line number within the legacy SIT 185 message format that contains 15 lines.*

2.1.7 Nationally Defined Alert Messages Designed for Automated Processing

The USMCC sends nationally defined alert messages designed for automated processing to designated destinations. These alert messages are described in Annex 9.

2.1.8 Messages Sent to the Location of Aircraft in Distress Repository (LADR) for ELT(DT)s

The Location of Aircraft in Distress Repository (LADR) is an ICAO-mandated database that contains data from ELT(DT) transmissions. In simple terms, data is sent to the LADR for each ELT(DT) transmission so that the location of the associated aircraft, potentially in distress, can be tracked by Air Traffic Service Units (ATSUs), aircraft operators, and other relevant authorities. Unlike other ELTs, ELT(DT)s may be activated, either automatically or manually, while the aircraft is still in flight.

The LADR is expected to be operated by EUROCONTROL. The LADR will send notifications (not considered “alerts”) to registered users when data is present that matches their user profile. For ATSUs and RCCs, this will be an event in a geographical area (e.g., their area of responsibility and adjacent areas); for aircraft operators, it will be an aircraft that they operate. All SAR authorities wishing access to the LADR data first are required to register to access ICAO’s Ops Control Directory (sometimes referred to as OPS CTRL), because the points of contact in the Ops Control Directory are used to establish access to the LADR. The distribution of ELT(DT) data from the C/S system is illustrated in Figure 2.1. ELT(DT) data will be automatically distributed to designated SAR authorities (i.e., SPOCs), as well as placed in the ICAO LADR, where it will be made available to ATSUs, Airline Operators and RCCs that have subscribed to the LADR.

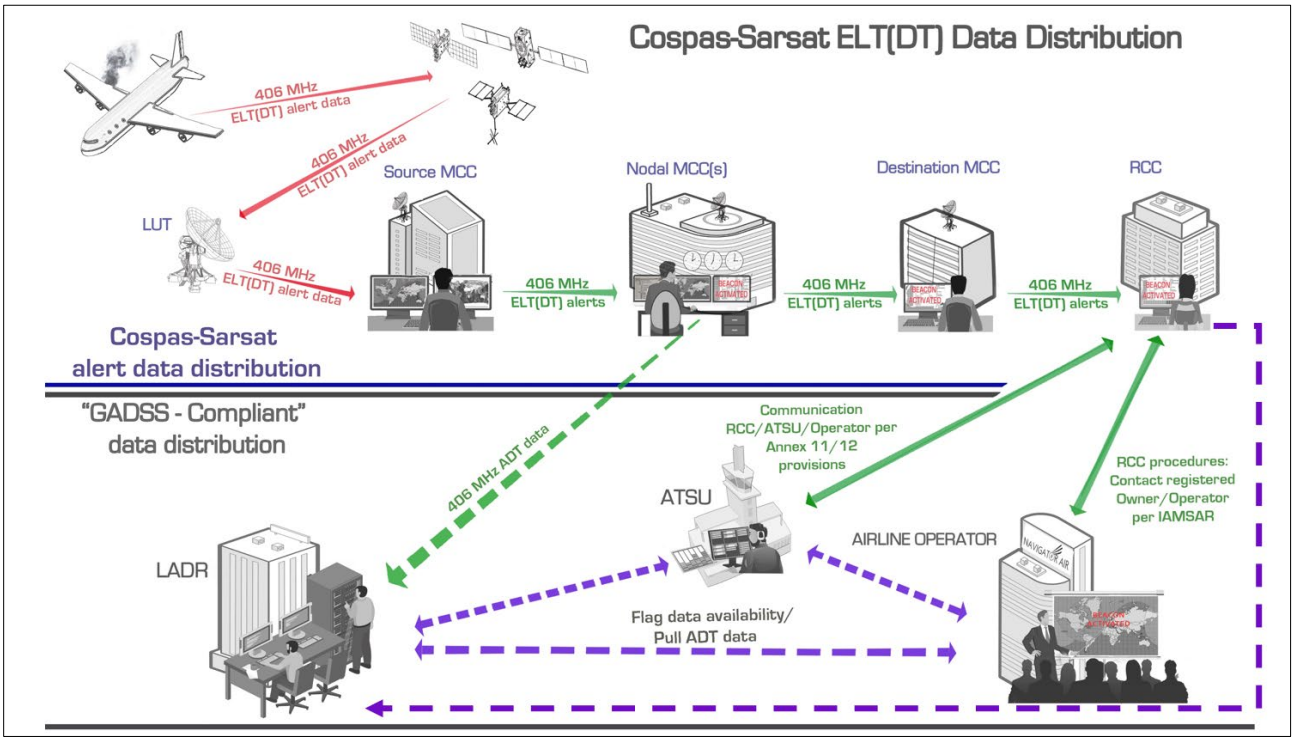


Figure 2.1: Distribution of ELT(DT) Data from the Cospas-SARSAT System

As required by document C/S A.001, ELT(DT) data is transmitted to the LADR by the nodal MCC associated with the destination MCC or by another nodal MCC on behalf of that nodal MCC. Based on available DOA or encoded position data*, the appropriate nodal MCC sends a new alert to the LADR if:

a) The detect time is at least 3 seconds from the detect time of all other alerts that the MCC has sent to the LADR for the beacon;
b) The alert has DOA or encoded position data and the detect time is at least 3 seconds from the detect time of all other alerts with DOA or encoded position data that the MCC has sent to the LADR for the beacon; or
c) The alert is a confirmed cancellation of the beacon activation, based on the receipt of three separate cancellation messages with detect times within 110 seconds (with no intervening non-cancellation messages).

**While document C/S A.001 currently indicates that unlocated alerts may be sent to the LADR, ICAO recently stated that only located alerts will be allowed in the LADR; once ICAO formalizes this new requirement, A.001 will be updated accordingly.*

ELT(DT)s comply with ICAO GADSS (Global Aeronautical Distress and Safety System) requirements for Autonomous Distress Tracking (ADT) to transmit an accurate position information at least every minute, which should allow an aircraft crash site to be located within six nautical miles (6 NM). These requirements are described in the *Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery* (ICAO document 10054). An ADT capability will be required in most new commercial aircraft as of 1 January 2025.

Administrations should follow defined national SAR procedures for responding to the activation of an ELT(DT). As the alert is likely emanating from an aircraft still in flight, DISTRESS TRACKING alert

messages should be sent to an Aeronautical RCC (ARCC) which should rapidly liaise with relevant ATSU(s) and airline operator(s) as specified in dedicated annexes to the ICAO Convention, IAMSAR Manual (ICAO document DOC 9731), and GADSS documentation.

2.2 Support Messages

Support messages are often sent in response to specific requests by an RCC, SPOC, or MCC. The SIT 950 message may be sent without request, to provide information on system status.

2.2.1 Support Message Types

Table 2.3 provides a brief description of the support messages generated by the USMCC. The message name is in uppercase letters, as it appears on the message.

Table 2.3: Description of Support Messages

SIT	Message Name/Comments
950	**NARRATIVE MESSAGE** This message is used to transmit narrative text to the RCCs. This may provide information on system status.
951	**ALERT SITE QUERY** This message is used to provide information on active and closed alert sites processed by the USMCC. Queries may be based on time, site ID, beacon ID, or geographical area.
952	**406 BEACON REGISTRATION** This message is used to transmit 406 MHz beacon registration information to RCCs and SPOCs, either for USA-coded or non-USA-coded beacons. (MCCs use the SIT 925 message to send registration information to other MCCs.) This message may be sent in response to a request for beacon registration. It may also be sent automatically when the USMCC receives a SIT 925 message from another MCC for a beacon located in the SRR of a USA RCC or SPOC.
953	**BEACON-LUT MUTUAL VISIBILITY** This message is used to transmit a list of LEOSAR satellite passes that have mutual visibility with a USA LEOLUT and a specified location.
956	**OPERATIONAL CHARACTERISTICS FOR AN SGB TAC** This message is used to transmit information about the operational characteristics of an SGB, based on the TAC number encoded in the beacon message.

2.2.2 Support Message Structure

Table 2.4 describes the structure of alert message created by the USMCC, with a list of key fields provided in parentheses. Sample support messages are presented in Section 4.

Table 2.4: Support Message Structure

Message Header (message number, transmit time, message type)
Support Message Data (e.g., narrative text, alert data, beacon registration data)
Message Trailer (formal end of message)

3 USMCC ALERT MESSAGE COMPONENTS SENT TO RCCs

The following sections describe the common components of alert messages sent to USA RCCs, as summarized in Table 2.2. Components of alert messages that are the same for multiple alert messages (such as the Message Header and Beacon ID) are not described per alert message. Section 4 provides sample alert messages and describes their unique components.

Note: Brackets [] are used to indicate that a message component is not present on all messages.

3.1 Message Header

As shown in Table 3.1.1, the message header contains no field labels. The message header is the same for alert and support messages. Lines 1 and 2 conform to the message header definitions in document C/S A.002 used by MCCs to send messages to other MCCs. The message header provides message accounting information, including sender identification, destination identification, message type identification, transmission time, and unique message number.

Line 1 of this header provides the current (Curr#) and original (Orig#) message numbers for this message to the RCC. The current message number is sequential per destination (RCC) to enable message tracking by RCCs. (Thus, an RCC that received message number “00005” followed by message number “00007” would know to request message number “00006.”) The original message number is zero unless the message is a retransmission of a previous message sent to the same RCC. The message source (Srce) is always 3660, which identifies the USMCC. The message transmission time (YY DDD HHMM) contains the Year (YY), day of the year (DDD), and hour (HH) and minutes (MM) of the day. This time is in Zulu or Coordinated Universal Time (UTC), as are all other times on the RCC message.

Line 2 of the message header contains a numeric identifier for the message type, the SIT, as defined in Table 2.1. An alphanumeric identifier for the message destination (Dest) is also provided. Annex 7 lists message destination identification codes for RCCs and SPOCs on RCC alert messages sent from the USMCC.

Messages sent to US Air Force (USAF) RCCs (including the AFRCC and the AKRCC) contain an additional line after Line 2 of the message header that contains the site ID (format SITE ID: NNNNN, as described in Section 3.2.1.2); this additional line is provided to allow the Site ID to be identified by USAF personnel when the message is received via AFTN/AISR without having to open the message.

Message Title Special Information is only included when the 406 MHz beacon message is unreliable (see Section 2.1.4), when the beacon type is Ship Security (see Section 2.1.5), or when the beacon is associated with certain national programs (see Annex 8). The Message Name (as defined in Table 2.1) corresponds to the message type.

Table 3.1.1: Message Header Format

/Curr# Orig#/Srce/YY DDD HHMM /SIT/Dest [Message Title Special Information] **** Message Name ****

In the following example (Table 3.1.2), message 17127 was sent by the USMCC to the AFRCC (Dest= 366S) at 0939 UTC on 27 September 2022. The message type is a "406 BEACON INITIAL LOCATED ALERT," and the SIT number is 171. Note that the same message type (title) may occur on a SIT 174 message.

Table 3.1.2: Message Header Sample (Non-SSAS Beacon)

/17127 00000/3660/22 270 0939 /171/366S **** 406 BEACON INITIAL LOCATED ALERT ****

The following example (Table 3.1.3) contains an additional message title that indicates that an SSAS beacon was activated.

Table 3.1.3: Message Header Sample (SSAS Beacon)

/17111 00000/3660/22 273 1239 /171/CGOP !!! SHIP SECURITY ALERT !!!!!!!!!! **** 406 BEACON INITIAL LOCATED ALERT ****

Table 3.1.4 contains an additional message title that indicates that an ELT(DT) beacon was activated.

Table 3.1.4: Message Header Sample (ELT(DT))

/13491 00000/3660/22 121 1239 /371/366S "!!! DISTRESS TRACKING ELT !!! **** 406 BEACON INITIAL LOCATED ALERT ****

3.2 Alert Data Block

As outlined in Tables 3.2.1.a (FGB) and 3.2.1.b (SGB), the alert data block has the following the structure:

1) The Beacon ID/Site ID Header is always present. The Beacon ID is 15 hexadecimal digits for an FGB or 23 hexadecimal digits for an SGB, as discussed below.
2) Information on Site Closure is only present on SIT 176 messages (FGBs) and SIT 376 messages (SGBs).
3) The MCC Reference Position Summary is only present when position is confirmed (i.e., when two positions from independent sources match within 20 km).
4) New Alert or Missed Detection/Site Closure Information is always present. It provides the new alert or missed detection/site closure information that caused the message to be generated. Missed Detection/Site Closure information is specific to the SIT 176 and SIT 376 messages.

Table 3.2.1.a: FGB Alert Data Block Structure

BEACON ID: XXXXX XXXXX XXXXX SITE ID: NNNNN
[SITE CLOSURE DATA]
[MCC REFERENCE POSITION SUMMARY]
[NEW ALERT OR MISSED DETECTION INFORMATION]

Table 3.2.1.b: SGB Alert Data Block Structure

BEACON ID: XXXXXX XXXXXX XXXXXX XXXXX SITE ID: NNNNN
[SITE CLOSURE DATA]
[MCC REFERENCE POSITION SUMMARY]
[NEW ALERT OR MISSED DETECTION INFORMATION]

Table 3.2.2 provides a sample alert data block where position is not confirmed for an FGB.

Table 3.2.2: Alert Data Block Sample (Position Not Confirmed)

```
BEACON ID: ADCD0 21DDC C2001      SITE ID: 65533

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
53   N/A A  35 25.2N  076 36.4W  27 093725 SEP S13 006 CMCC   AFRCC
47   N/A B  31 42.7N  058 40.0W  27 093725 SEP S13 006 CMCC   LANTAR
```

Table 3.2.3 provides a sample alert data block for an alert that enabled the position to be confirmed (i.e., if the SIT number is 174) or enabled a confirmed position to be updated (i.e., if the SIT number is 175). The presence of the "MCC REFERENCE POSITION" indicates that the position is confirmed (i.e., when two positions from independent sources match within 20 km).

Table 3.2.3: Alert Data Block Sample (Position Confirmed)

```
BEACON ID: ADCD0 21DDC C0801      SITE ID: 73531

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
38 45.5N 076 56.9W  001.5 HRS  AFRCC

**** NEW ALERT INFORMATION ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  011 D  38 43.2N  076 52.3W  17 054513 FEB MEO 004 FL1
```

3.2.1 Beacon ID/Site ID Header

3.2.1.1 BEACON ID

The BEACON ID is a hexadecimal code that identifies the 406 MHz FGB (15-hex) or a 406 MHz SGB (23-hex). The BEACON ID corresponds to bits 26 to 85 of the 406 MHz message transmitted by the FGB, as described in document C/S T.001. For location protocol FGBs, the bits of the BEACON ID that contain location are defaulted so that the same BEACON ID is referenced regardless of its encoded position. For SGBs, the bits that contain location are separate from the bits that contain the 23-character hexadecimal ID, so the BEACON ID for an SGB does not contain default values. Some information provided in the Beacon Decode section of the RCC message is not available in the 15-hex ID portion of the FGB messages or the 23-hex ID portion of the SGB message.

The BEACON ID is used to reference USMCC registration data for the beacon. The BEACON ID is useful in discussing a SAR case with another SAR agency, especially when the other SAR agency does not receive alert messages from the USMCC since the SITE ID (see Section 3.2.1.2) is specific to the USMCC. A sample data line containing the 23-character SGB ID is provided below.

```
BEACON ID: 123456 789ABC 123456 12345      SITE ID: 98592
```

3.2.1.2 SITE ID

The SITE ID is a five-digit number generated by the USMCC that identifies all messages for an activated beacon. It may be used to discuss the beacon activation with personnel at the USMCC or with other USA RCCs or USA SPOCs that have received alert messages from the USMCC for the beacon activation. The five-digit SITE ID is assigned sequentially, and wraps around after the maximum value 99999 is assigned; e.g., after SITE ID 99999 is assigned, the next values would be 00000 and 00001. When the

USMCC Incident History Database (IHDB) is accessed, refer to the detect time to ensure that the appropriate IHDB case is being referenced for a specific SITE ID.

3.2.1.3 Site Closure Information

This information is only present on SIT 176 and SIT 376 messages. It indicates whether the site is open or closed, and if closed, the reason for closure. The SIT 176 and SIT 376 messages are described further in Section 4.7.

3.2.2 Position Confirmation and MCC Reference Position Summary

3.2.2.1 Position Confirmation

Position confirmation is the process by which the MCC attempts to determine the actual beacon position. Position confirmation is achieved when two positions for a beacon from independent sources match within 20 kilometers, as specified in document C/S A.001. Two locations are independent if they are two different types of location, or for two Doppler locations or for two DOA locations, if they are derived from different beacon events, as outlined in Table 3.2.4.

Table 3.2.4: Determining if Two Locations for a Beacon are Independent

Location Type	Encoded	Doppler	DOA
Encoded	No	Yes	Yes
Doppler	Yes	Different satellites or time (TCA) difference of at least 20 minutes*	Yes
DOA	Yes	Yes	a) Each satellite set has a unique satellite and there is at least a 2-second time separation in some portion of the time period associated with each DOA position, or b) the last detect time for the two DOA alerts differs by at least 30 minutes

**Two pairs of Doppler locations are not independent if each Doppler location matches a Doppler location in the other solution; see "406 Beacon Unresolved Doppler Position Match" in Table 2.1.*

Note that the independence of two encoded locations cannot be determined as the two encoded locations come from the same source, i.e., the GNSS unit on or attached to the beacon. In addition, position is never confirmed for ELT(DT)s; since ELT(DT)s are assumed to be fast-moving, it is assumed that the "real" beacon position is continually changing.

The MCC Reference Position provided by the MCC is an estimate of the actual beacon position based on data available to the MCC, and should not be assumed to be the actual beacon position. While the MCC Reference Position computed by the MCC generally corresponds to the actual beacon location within 20 km, the actual beacon position (as determined by SAR personnel) may differ from the MCC Reference

Position reported by the MCC, due to poor (but matching) location data being provided to the MCC or because the beacon moved significantly after position data was provided to the MCC. The MCC estimate of the beacon position is provided with the title "MCC REFERENCE POSITION" to discourage SAR personnel from assuming that this position is known to be the actual beacon position.

3.2.2.2 MCC Reference Position Summary

This information is only present when position is confirmed. See the sample in Table 3.2.3.

3.2.2.2.1 MCC Reference Position

The MCC Reference Position LATITUDE (DD MM.T H) is provided in degrees (DD), minutes (MM), tenths of a minute (T), and hemisphere (N=north, S=south). The MCC Reference Position LONGITUDE (DDD MM.T H) is provided in degrees (DDD), minutes (MM), tenths of a minute (T), and hemisphere (E=east, W=west). Since the MCC Reference Position is a weighted average of multiple positions that may be calculated at different times, it may not reflect the current beacon position.

The USMCC computes the MCC Reference Position using matching encoded, DOA, and Doppler position data, and weighs this position data based on various quality factors. For an FGB, a refined encoded position is given more weight than a coarse encoded position. The weight of a DOA position is based on the expected horizontal error computed by the MEOLUT (described in Section 3.2.3.2) if this value is available; if the expected horizontal error is not available, the weight of a DOA position is based on associated factors that include the number of beacon bursts, the number of satellites that detected the beacon, and satellite geometry (where a large spread of satellite positions is better). The weight of a Doppler position is based on the number of beacon bursts, satellite geometry, the reliability of beacon frequency measurements, and the impact of recent satellite maneuvers, consistent with how these factors are used to determine that a Doppler position may be inaccurate or suspect (see Section 3.2.5.1).

The MCC Reference Position only includes recent positions (where the detect time is within the last hour, normally), which makes it more likely that the MCC Reference Position will maintain proximity to the position of a moving beacon. If the USMCC determines that new positions are consistently in conflict with the previously computed MCC Reference Position and the MCC Reference Position stops getting updated with recent position data, then the USMCC will attempt to re-compute (re-establish) the MCC Reference Position based on recent matching position data. Note that the algorithm to re-establish the MCC Reference Position is only designed to handle slow-moving beacons (e.g., beacons drifting in the ocean), not fast-moving beacons (e.g., aircraft in flight). When a new solution is used to re-establish the MCC Reference Position, the distance between matching positions may exceed 20 km; the 20-km threshold is otherwise used to determine if positions match or are in conflict, both before and after position confirmation. ***To better determine the current position in cases where the beacon is moving, view (or plot) the positions and detect times from the individual alert messages.***

When the USMCC re-establishes the MCC Reference Position, as described above, a warning for an FGB is provided in the SIT 175 alert message, as described in Section 3.2.3.10. Similar information is provided for an SGB in the SIT 375 message.

3.2.2.2.2 Duration, SRR, and BUFFER

The DURATION is the period of time the beacon has been active, based on the difference between the earliest and most recent detect times. The DURATION takes into account the time of the last beacon burst for a MEOSAR alert, which may differ from the time of the first beacon burst. The SRR is the primary SRR of the first alert associated with the MCC Reference Position (see Table 3.2.5). More information on the SRR and BUFFER(s) is provided in Section 3.2.3.9.

Table 3.2.5: Sample MCC Reference Position Summary

```
**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
38 45.5N 076 56.9W  001.5 HRS  AFRCC
```

3.2.3 Solution Data Line (New Alert Data)

A data solution line contains information about a DOA position, an "A" side Doppler solution, a "B" side Doppler solution, and an encoded location or an unlocated alert, as described in this section. Solution data lines are provided for new solutions (per Table 3.2.6) and for previous solutions (see Section 3.5.3). Once position has been confirmed, solution data lines in the Previous Message Information are not provided for an image (incorrect) Doppler location when the associated Doppler location matches the MCC Reference Position.

Table 3.2.6: Sample Solution Data Line (New Solution)

```
**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  007 D  08 29.2N  135 58.9E  18 130219 FEB MEO 004 VNMCC  MARSEC
```

3.2.3.1 Probability (PROB)

The PROB field indicates the probability that the associated Doppler (A or B) position is the real position. Of the two positions generated by Doppler location processing, the "A" position is by definition the position that has the higher probability of being real. The values for PROB range from 50 to 99 for the "A" side and from 01 to 50 for the "B" side. *While the solution with the higher probability is more likely to be the real position, even the highest reported probability (99) does not guarantee that the associated position is the real position.* An "A" side location with a higher probability tends to be more accurate; for example, an "A" side location with a 95% probability is likely to be more accurate than an "A" side location with a 55% probability.

If the Doppler location is computed using two LEOSAR detections (bursts) and GEOSAR frequency data, then field PROB is set to 50 and field NUM is set to 2. For solutions without Doppler location, field PROB has no meaning and is listed as “N/A”.

3.2.3.2 DOA Position Expected Error (EE)

The Expected Horizontal Error (EHE) is the radius of the circle that is centered on the estimated DOA location and contains the true location with a probability of 95 ± 2 %, per document C/S T.019 (MEOLUT Performance Requirements). The EHE is a value between 000.00 and 999.99 km (reported by MEOLUT in kilometers, but displayed on the RCC message in nautical miles) and provides an indication of the accuracy of the DOA location. The EE field on the RCC message provides the EHE of the DOA position in nautical miles (NM). If the EHE has the default value of 000.00, the accuracy is UNKNOWN. If the EHE is greater than 277.8 km (150 NM), the accuracy is shown as “999.99,” which means OVER 150 NM.

In a message sent to a USCG RCC or US SPOC, the EHE is only provided in the EE field if the MEOLUT is commissioned to provide the EHE reliably; otherwise, the EE field is set to “N/A”. The reason for filtering the EHE value is that the value is often unreliable (i.e., too small relative to the actual DOA position error) when the beacon is moving (e.g., drifting at sea) and the MEOLUT is not commissioned to provide this information. Analysis also indicates that the DOA position is not as accurate for moving beacons as it is for static beacons. C/S MEOLUT providers are working to improve the DOA position accuracy and expected error reliability for moving beacons. The C/S website link for “MEOLUT Configuration” (column “DOA & EHE”) indicates which MEOLUTs are commissioned to provide DOA locations and EHE per document C/S T.019 requirements (including accuracy requirements for slow-moving beacons).

Available EHE is always provided in the EE field to US Air Force destinations.

3.2.3.3 Solution (SOL)

The SOL field indicates whether the data line is associated with the “A” position (the Doppler position with the higher probability of being real), the “B” position (the Doppler position with the lower probability of being real), the “D” (DOA) position, or the “E” position (position encoded in the 406 MHz beacon message). For solutions with no position, SOL is listed as “U” (Unlocated).

3.2.3.4 Encoded (GNSS) Location Precision, Resolution, and Uncertainty

The precision on an FGB encoded location provided on alert messages depends on the beacon protocol and the reliability of the two error protected components of the 406 MHz beacon message. If the first error protected data field (PDF-1) for an FGB message is unreliable, the second error protected data field (PDF-2) for an FGB ELT(DT) message is unreliable, or a component of the fixed (non-rotating) portion of the SGB message is unreliable, then the entire 406 MHz beacon message is unreliable (per Section 2.1.4) and no portion of the beacon message is usable, including the encoded location.

If the first error protected data field (PDF-1) is reliable and the second error protected data field (PDF-2) is unreliable for an FGB then only the portion of the encoded location that is contained in PDF-1 is usable. If encoded location data in PDF-1 is usable, but the encoded location "offset" in PDF-2 is not usable, then the encoded location is deemed "coarse." If encoded location data is usable in both PDF-1 and PDF-2, then the encoded location is deemed "refined." The distinction between coarse and refined is not relevant for an SGB-encoded position since SGBs do not contain separate error protected data fields.

Table 3.2.7 provides the resolution and the uncertainty of encoded location, based on beacon protocol and the reliability of the 406 MHz FGB message. This table also provides the corresponding value in the "POSITION RESOLUTION" field, as described in section 3.3.1. User protocol beacons that are not national use seldom contain encoded location and only provide encoded location information in PDF-2.

The uncertainty of the encoded position is the maximum difference between the GNSS position processed by the beacon, and the encoded position transmitted to the RCC, per C/S documents T.001 and T.018. All beacons are required to round off (i.e., not truncate) latitude and longitude data to the available resolution. As a result, if both PDF-1 and PDF-2 for a FGB are usable, then the uncertainty of the encoded position is half the resolution, as shown in Table 3.2.7. The encoded position uncertainty for Return Link Service (RLS) beacons with only PDF-1 usable is half the resolution available in PDF-1, because all available resolution is provided in PDF-1.

However, some standard and national location protocol FGBs are coded using an older methodology, in which:

a) the encoded position value in PDF-1 remains the same as long as it is possible for the refined encoded position (which contains an encoded position offset in PDF-2) to be precise within 2 seconds, and
b) the encoded position offset provided in PDF-2 may exceed the resolution in PDF-1.

When only PDF-1 is usable for beacons employing this older methodology, the encoded position uncertainty is greater than the resolution available in PDF-1, as shown in Table 3.2.7. If it is known that a standard or national location protocol FGB is coded with a newer methodology in which all bits available in PDF-1 are always set to be as close as possible to the actual position, then the actual uncertainty is 7 minutes 30 seconds or 1 minute, respectively.

The encoded position uncertainty reported in Table 3.2.7 is for one component (latitude or longitude) and does not take into account that the actual uncertainty includes the uncertainty of both latitude and longitude. For a beacon located at the equator (where a degree of latitude and a degree of longitude each correspond to a distance of about 111 km), the maximum uncertainty is about 1.41 times the uncertainty reported in the table. In general:

Maximum Uncertainty = SquareRoot of ((LatitudeUncertainty* LatitudeUncertainty) + (LongitudeUncertainty * LongitudeUncertainty)).

For standard, national location, Return Link Service, and ELT(DT) protocol FGBs, the precision (or resolution) of the refined location (i.e., latitude and longitude) is 4 seconds (1 fifteenth of a minute), as shown in Table 3.2.7. This means that a refined encoded location for these protocols has more precision than a tenth of a minute but less precision than a hundredth of a minute. Note that coarse encoded location has less precision than 4 seconds.

Table 3.2.7: Resolution and Uncertainty of Encoded (i.e., GNSS) Location Based on Beacon Protocol and Message Reliability

Beacon Protocol	Only PDF-1 usable in FGB (Value in "POSITION RESOLUTION" field) Uncertainty*	PDF-1 & PDF-2 usable in FGB, or SGB (Value in "POSITION RESOLUTION" field) Uncertainty*
Standard Location (FGB)	15 minutes (at 45 degrees latitude, equals 10.6 nm longitude and 15.0 nm latitude) (15 MINUTES) Uncertainty: 30 minutes (7 minutes 30 seconds if newer coding methodology used)	4 seconds (4 SECONDS) Uncertainty: 2 seconds
National Location (FGB)	2 minutes (at 45 degrees latitude, equals 1.4 nm longitude and 2.0 nm latitude) (2 MINUTES) Uncertainty: 4 minutes (1 minute if newer coding methodology used)	4 seconds (4 SECONDS) Uncertainty: 2 seconds
Return Link Service**, ELT(DT) (FGB)	30 minutes (at 45 degrees latitude, equals 21.2 nm longitude and 30.0 nm latitude) (30 MINUTES) Uncertainty: 15 minutes	4 seconds (4 SECONDS) Uncertainty: 2 seconds
User - not National (FGB)	Encoded location not available (NONE)	4 minutes (4 MINUTES) Uncertainty: 2 minutes
FGB User – National (CSEL)	1 degree latitude, 15 degrees longitude (1 DEG LAT, 15 DEG LONG)	2 seconds (2 SECONDS) Uncertainty: 1 second
FGB User – National (SEPIRB)	1 degree (1 DEGREE)	2 seconds (2 SECONDS) Uncertainty: 1 second
SGB	PDF-1 is not applicable	10 meters (18 METERS) Uncertainty: 10 meters

**The uncertainty is reported for either latitude or longitude. Taking into account latitude and longitude together, the maximum uncertainty is about 1.41 the value reported in the table.*

***Return Link Service (RLS) beacons provide return link information from ground stations via satellites to the beacon. Operational use is permitted for specific RLS beacon models approved for operational use, as documented at https://www.cospas-sarsat.int/en/beacons-pro/experts-beacon-information/approved-beacon-models-tacs.*

The possible values for the FGB encoded location, only available in 4-second intervals, are shown in Table 3.2.8. Values not included in this table for hundredths of a minute (such as .01, .02, and .03) do not occur in the encoded location for the standard and national location protocols. Additional values are possible for USA National User (CSEL and SEPIRB) protocols, which have precision of 2 seconds.

Table 3.2.8: Possible Values for the Encoded Location in Standard, National, RLS, and ELT(DT) Location Protocol FGBs (4-second interval vs. hundredths of a minute)

Encoded Seconds	Hundredths of a Minute
0	.00
4	.07
8	.13
12	.20
16	.27
20	.33
24	.40
28	.47
32	.53
36	.60
40	.67
44	.73
48	.80
52	.87
56	.93

For SGBs, the encoded position resolution is always reported as 18 meters, corresponding to an uncertainty of 9 to 10 meters. While a resolution of 3.4 meters is encoded in the SGB message, the encoded position is reported on the RCC message with a precision of hundreds of a minute (e.g., latitude 34 39.75N), which means that the position must change by about 18 meters (e.g., to latitude 34 39.76N) for the difference to be visible on the RCC message.

For both FGBs and SGBs, the encoded position uncertainty is reported in SIT 185 messages per document C/S A.002, whereas the encoded position resolution is reported in RCC formatted messages.

All ELT(DT)s are required to have a GNSS capability. A DOA location is only provided for an ELT(DT) if the MEOLUT is commissioned to provide DOA location for fast-moving beacons, and the GNSS location is normally considered the primary location data for an ELT(DT).

3.2.3.4.1 Latitude

The LATITUDE (DD MM.t H) of the Doppler and DOA location is provided in degrees (DD), minutes (MM), tenths of a minute (t) and hemisphere (N=north, S=south). The LATITUDE (DD MM.hh H) of the encoded location is provided in degrees (DD), minutes (MM), hundredths of a minute (hh) and hemisphere (N=north, S=south). For solutions with no position, the LATITUDE is listed as “N/A”. Encoded location precision is further described in Section 3.2.3.4.

3.2.3.4.2 Longitude

The LONGITUDE (DDD MM.t H) of the Doppler and DOA location is provided in degrees (DDD), minutes (MM), tenths of a minute (t) and hemisphere (E=east, W=west). The LONGITUDE (DDD MM.hh H) of the encoded location is provided in degrees (DDD), minutes (MM), hundredths of a minute (hh) and hemisphere (E=east, W=west). For solutions with no position, the LONGITUDE is listed as "N/A." Encoded location precision is further described in Section 3.2.3.4.

3.2.3.5 Detect Time

The DETECT TIME format is DD HHMMSS MON, where DD is the day of month, HHMMSS is hour, minute, and seconds of the day in Zulu time (UTC), and MON is the month of the year. The DETECT TIME is truncated at seconds.

For MEOSAR alerts, the DETECT TIME is the time that a satellite last detected the beacon for the alert; the first detect time for MEOSAR alerts is provided in field FIRST DETECT TIME (per Section 3.2.4.2) and is earlier than the time that a satellite last detected the beacon in a MEOSAR alert derived from multiple beacon bursts. If the (last) DETECT TIME matches the FIRST DETECT TIME, the solution is from a single beacon burst. Note that the first DOA location provided for an alert site is usually from a single burst, since the MEOLUT and MCC are required to report usable DOA positions as soon as they are available. Information on the accuracy of DOA positions for single burst and multiple burst solutions is provided in Section 3.2.5.2.

For Doppler solutions, the DETECT TIME is the TCA of the satellite to the beacon. The TCA is computed at the ground station (LEOLUT), and may differ from the detect time of the individual 406 MHz beacon bursts received at the satellite by as much as 8 – 10 minutes; for a Doppler solution computed and sent to the MCC in near real-time, it is possible for the RCC to receive the alert message prior to the computed TCA.

For non-Doppler solutions from LEOLUTs, the DETECT TIME is the time that the satellite last detected the beacon for the alert. For solutions from GEOLUTs, the DETECT TIME is the time that the satellite first detected the beacon for the alert. GEOLUTs report the first detect time for each alert so that the time of beacon activation is more accurately provided for a rapidly moving beacon (e.g., in the event of an aircraft crash).

3.2.3.5.1 Detect Time and Encoded Position Updates

The DETECT TIME for encoded position is the time associated with the satellite detection, as described in Section 3.2.3.5. It does not directly indicate the time that the encoded position was updated in the beacon; however, a change in the FGB refined encoded position indicates that the update occurred since the detect time for the previous refined encoded position. Note that a change in a refined encoded position compared to a previous coarse encoded position does not imply that the position encoded in the FGB message has been updated, but may merely mean that the satellite and LUT have now succeeded in

decoding all position data in the beacon message. In accordance with document C/S T.001:

1) the encoded position may be updated as frequently as every 5 minutes and
2) the encoded position should be cleared if it is not updated within 4 hours.

An FGB that is designed to update its encoded position frequently (e.g., every 5 or 20 minutes) may fail to update the position to precisely reflect the new beacon position because the beacon is unable to obtain sufficient satellite data to compute a new position. This may occur because the beacon's view of the sky is obstructed (e.g., by its associated vessel, tree cover, or a canyon wall).

Newer beacons (i.e., beacons first submitted for C/S type approval after 1 November 2015) with an internal navigation device may provide encoded position updates less frequently as time passes after beacon activation; e.g., only every 15 minutes once the beacon has obtained an encoded position or has been active for 10 minutes, per document C/S T.001. This means that the encoded position may not keep up with the actual position in a timely manner. The rationale for less frequent updates over time is to preserve battery life in case SAR is not complete soon after beacon activation.

SGBs provide the time of the encoded position update. This time is provided with seconds of the minute in the beacon decode section of the RCC message.

3.2.3.6 Satellite (SAT) and Number of Detections (NUM)

The satellite field (SAT) provides information about the satellite(s) that detected the beacon and contains three characters. For MEOSAR alerts, this field is set to "MEO" because MEOSAR alerts are normally generated from detections from multiple satellites.

Table 3.2.9 provides the satellite ID used on RCC messages in addition to the satellite name, 3-digit satellite ID, and type for LEO and GEO satellites.

For MEOSAR alerts, field NUM is set to the number of detections (packets) for which data was used to generate the alert, where each beacon burst received through one antenna is counted as a separate detection or packet. (For example, if two beacon bursts are each received from two antennas, the number of detections is 4.) The field is set to "N/A" for MEOSAR alerts when no data is available. If the number of detections exceeds 99, then NUM is reported as 99.

For LEOSAR and GEOSAR alerts, field NUM is usually set to the number of detections (beacon bursts) used to generate the alert. However, for some GEOLUTs, NUM may include bursts processed with previous alerts and may be as high as 121.

If NUM is 1 for the first alert for an alert site, then the alert may be suspect (i.e., not correspond to a transmission from the beacon with the reported beacon ID). The USMCC identifies a suspect (i.e., "uncorroborated") MEOSAR alert based on a single detection, as described in Section 3.2.7.

Table 3.2.9: LEOSAR/GEOSAR Satellite Type Description

Satellite ID on RCC Message*	Satellite Name	3-Digit Satellite ID	Satellite Type
C14	COSPAS-14	114	LEO
G18	GOES-18	218	GEO
G19	GOES-19	219	GEO
I3	INSAT-3A	243	GEO
I4	INSAT-3D	244	GEO
I5	INSAT-3DR	245	GEO
M1	MSG-1	261	GEO
M2	MSG-2	262	GEO
M3	MSG-3	263	GEO
M4	MSG-4	264	GEO
M5	MTG-I1	265	GEO
R1	ELEKTRO-L3	221	GEO
R2	Louch-5A	222	GEO
R3	Louch-5V	223	GEO
R4	ELEKTRO-L2	224	GEO
S13	SARSAT-13	013	LEO

** Satellite type naming convention:*
C = COSPAS (Russia) low-earth orbiting, G = GOES (US) geostationary, I = INSAT (India) geostationary,
M = MSG or MTG EUMETSAT geostationary, R = ELEKTRO/LUCH (Russia) geostationary,
S = SARSAT (US/Canada/France) low-earth orbiting

Doppler location can only be generated from beacon burst data received from COSPAS and SARSAT satellites, which are polar orbiting. On occasion, Doppler location may not be generated for beacons detected by LEOSAR (polar-orbiting) satellites, because too few usable beacon bursts were detected.

While a LEOSAR or GEOSAR alert with a single detection (i.e., NUM = 1) may also be suspect (i.e., not correspond to a transmission from the beacon with the reported beacon ID), the USMCC does not have rules to identify LEOSAR or GEOSAR alert as suspect (”uncorroborated”) based on a single detection. However, as is the case for MEOSAR single detection alerts, corroborating information can be used to investigate single detection LEOSAR and GEOSAR alert, as described in Section 3.2.7.

If NUM is 2 on a Doppler alert, then the Doppler location was computed using two LEOSAR bursts and GEOSAR frequency data, and the probability (PROB) is set to 50 (50%).

3.2.3.7 Data Source (SOURCE)

The SOURCE indicates the ground station or LUT that ingested the satellite data. If the source is a USA LUT, then the LUT name is provided per Annex 2. If the source is not a USA LUT, then the name of the MCC associated with the LUT is provided per Annex 3. "N/A" indicates that the name of the data source is not known.

3.2.3.8 Search and Rescue Region (SRR) and BUFFER(s)

The SRR, BUFFER, and BUFF_2 are only provided on the new data solution line prior to position confirmation. After position confirmation, these fields are provided in the MCC Reference Position Summary, not on the new data solution line.

Collectively, these fields provide information about which SRRs are responsible for the SAR response. While the order of SRRs (when there is more than one SRR) provides some technical information, as described in this section, the order of the listed SRRs does not indicate which SRR has the lead role in coordinating the SAR response, and all message destinations should coordinate to ensure that a proper SAR response occurs.

For a located alert, the SRR is the primary SRR in which the alert is located, based on USMCC Geosort configuration for the location reported in the alert message. The USMCC Geosort is further described in Section 3.2.3.8.1. If two or more SRRs apply, then the BUFFER and BUFF_2 are the second and third SRRs in which the alert is located, respectively, which may be either buffers to the primary SRR or overlaps of the primary SRR.

The assignment of buffer SRRs (further described below) helps to ensure that the responsible SRR is notified of the distress alert, and takes into account the following uncertainties in the assignment of SRRs:

a) the Geosort configured in the USMCC may not precisely align with the actual SRR border when the border is defined by a geographical boundary (e.g., a jagged coast line) and the reported location is near an SRR boundary, and

b) the location reported in the alert message contains an inherent error that may cause the assigned SRR to differ from the SRR of the actual beacon location in cases where the reported location is near an SRR boundary (e.g., the reported location is in a bay that is a few kilometers from land).

If an alert is located in the primary or buffer SRR of additional (i.e., more than three) SRRs, these additional SRRs will not be listed here, but the message will be routed to all SRRs (message destinations) as appropriate. SRR names (primary and alternate) are provided on the data solution line per Annex 7. If the SRR name per Annex 7 exceeds 6 characters, then the value on the data solution line is limited to 6 characters.

For alerts located in the Canadian SRR, the SRR name for the associated Canadian RCC is provided. When the CMCC is operational, the USMCC sends all alerts located in the Canadian SRR to the CMCC. During a backup of the CMCC, the USMCC sends alerts located in the Canadian SRR to the associated Canadian RCC. The USMCC sends messages to Canadian RCCs in SARMaster format, as described in Annex 10.

If an alert is located outside of the SRR of the Canadian MCC (CMCC), the Bermuda SPOC, the COCESNA SPOC, the Dominican Republic SPOC, or any USA RCC, but within 50 km of its SRR boundary, then the USMCC designates the alert to be in the buffer for that SRR. In addition, the USMCC assigns a buffer SRR for other USA SPOCs and Canadian RCCs per Table 3.2.10. Note that the 348-km buffer distance for SPOCs with USA RCCs is based on the 200-nautical mile U.S. exclusive economic zone (EEZ). Otherwise, buffer SRRs are not designated for MCCs or SPOCs.

As agreed by the USAF and USCG, if an alert for an EPIRB is located in the AFRCC SRR and in the 50-km buffer of a USCG SRR, then the USCG SRR is listed as the primary SRR and the AFRCC SRR is removed from the SRR list for that location.

Table 3.2.10: SRR Buffers for Other USA SPOCs and Canadian RCCs

Primary SRR	Buffer SRR	Buffer Distance (km)
Halifax	Quebec City	25
Trenton	Quebec City	25
Trenton	Halifax	50
Trenton	Victoria	50
Halifax	Trenton	50
Victoria	Trenton	50
Belize	CGD07	348
Costa Rica	CGD07	348
Guatemala	CGD07	348
Guatemala	PacArea	348
Honduras	CGD07	348
Mexico SPOC	PacArea	348
Mexico SPOC	Mexico Telecom.	50
Mexico Telecom.	Mexico SPOC	50
Nicaragua	CGD07	348
Nicaragua	PacArea	348
Panama	CGD07	348
Panama	PacArea	348
El Salvador	PacArea	348

3.2.3.8.1 USMCC Geosort

The USMCC Geosort is a collection of geographical SRRs configured in the USMCC that is used to distribute alerts to US RCCs, US SPOCs and other MCCs based on geographical location.

The USMCC Geosort for MCCs is based on SRR information provided by the C/S Secretariat, as declared by national administrations that operate C/S MCCs that distribute alerts to SPOCs within their respective service areas (i.e., SRRs). As described in document C/S P.011, if adjacent MCCs do not agree on common boundaries for their respective service areas, then overlapping service areas are implemented by national administrations.

For US RCCs and US SPOCs (i.e., for SRRs in the USMCC service area), the USMCC Geosort is based on boundaries specified by (and coordinated by) the USCG, the USAF, and US SPOCs.
SRR boundaries specified in the USMCC and in other MCCs are ultimately based on boundaries defined and coordinated by the International Maritime Organization (IMO) and/or the International Civil Aviation Organization (ICAO). While boundaries defined by IMO and ICAO generally align, when this is not true, nations usually implement overlapping SRRs to help ensure that an adequate SAR response occurs for all located distress alerts.

3.2.3.8.2 Alert Data Distribution Procedures

The SRR and BUFFER fields are set based on reported position, the country or region coded in the 406 MHz beacon message, and USMCC alert data distribution procedures. USMCC alert data distribution procedures are described below.

As referenced in the alert data distribution procedures in this section, a beacon is USA coded if beacon registration information is maintained by the USA for the associated country or region coded in the 406 MHz beacon message. Table 3.2.11 lists the country/region codes for which beacon registration is maintained in the RGDB, as provided on the C/S Contact Lists web page (select “406 MHz Beacon Registries”). This table also lists destinations for unlocated alerts, NOCRs, and SSAS alerts for USA-coded beacons. During a backup of the USMCC, the CMCC distributes corresponding alerts to the destination(s) as listed in the table, except that the CMCC send NOCRs and unlocated alerts to the AFRCC where “US RCC” is listed.

a) All alerts for SSAS beacons are routed to a designated competent authority per country, which usually differs from the destination per country for non-SSAS alerts. SSAS alerts are not distributed based on location. Contact information for designated Competent Authorities is maintained by the associated MCC based on information provided by IMO and is not provided on the C/S website. The destination for SSAS alerts for non-USA-coded beacons associated with countries in the USA service area is provided in Annex 14.

b) For USA-coded SSAS beacons, all alerts are sent solely to the destinations (SRRs) as specified in Table 3.2.11. See Section 2.1.3.

c) For USA-coded beacons with special routing defined (e.g., USA special program beacons), all alerts are sent based on special routing configuration in the USMCC, where the special routing either replaces normal routing or adds to normal routing. Alerts for certain USA special program beacons are routed specially to the AFRCC based on agreement between the USAF and the associated special program. See Section 3.3.3 for more information about USA special programs.

When special routing is defined, this routing takes precedence over normal alert routing, which is described in item d.

d) For normal alert routing (i.e., for non-SSAS beacons and beacons that are not part of USA special programs with replacement routing):
   1. alert distribution is based primarily on beacon location
   2. additional alert distribution rules are described in sections e-k.

e) For USA-coded beacons, unlocated alerts and NOCRs are distributed per Table 3.2.11. Where this table lists "US RCC" for the country code, distribution is based on RGDB information and beacon type, as described in item f.

Table 3.2.11: USA Country/Region Codes and Associated Alert Data Destinations

Code (RCC Message Field "Country Code")	Country/Region Name	10 Digit Name (RCC Message Field "Country")	SRR for NOCRs and Unlocated Alerts*	SRRs for SSAS Beacon Alerts
303	Alaska	ALASKA	AKRCC	LantArea PacArea
559	American Samoa	SAMOA US	AUMCC	AUMCC
338	Hawaii	USA	US RCC**	LantArea PacArea
536	Northern Mariana Islands	MARIANA IS	MARSEC	LantArea PacArea
358	Puerto Rico	PUERTORICO	SANJN	LantArea PacArea
379	US Virgin Islands	VIRGIN US	SANJN	LantArea PacArea
366	USA	USA	US RCC**	LantArea PacArea
367	USA	USA	US RCC**	LantArea PacArea
368	USA	USA	US RCC**	LantArea PacArea
369	USA	USA	US RCC**	LantArea PacArea

** Excludes unlocated alerts for SSAS beacons.*

*** Distribution is based on RGDB information and beacon type, as described below. When the CMCC backs up the USMCC, the CMCC sends NOCRs and unlocated alerts for this country code to the AFRCC. See Section 2.1.6 for more information about alert messages sent during USMCC backup.*

f) For USA-coded beacons registered in the RGDB (where Table 3.2.11 indicates "US RCC" for the country code), the destination and SRR for unlocated alerts are based on:
   1. the home port (or airport) of the craft for which the beacon is registered, or
   2. the owner's home address (if the home port or home port SRR is not available).

If the relevant port or home address for a USA-registered beacon is not in the USA, then the SRR is determined per Annex 13. If two SRRs are provided in the RGDB, then the unlocated alert is

distributed to both SRRs. If no SRR is available in the RGDB for the registered beacon, then distribution is based on beacon type (per item f). In addition, unlocated alerts for unreliable beacon IDs registered in the RGDB are distributed as if the beacon ID was USA coded.

g) For USA-coded unregistered beacons (where Table 3.2.11 indicates "US RCC" for the country code) with a craft ID (i.e., with a vessel or aircraft ID encoded in the beacon message), the destination and SRR for unlocated alerts is based on the beacon type: AFRCC for ELTs, ELT(DT)s and PLBs, and PacArea for EPIRBs.

h) For USA-coded beacons (where Table 3.2.11 indicates "US RCC" for the country code) that are registered in the RGDB or are unregistered with a craft ID, the destination for a NOCR (associated with a located alert) follows the same rules as for an unlocated alert, per items f and g.

i) For USA-coded unregistered beacons without a craft ID that are not part of a USA special program with special routing, an unlocated alert is not distributed and no SRR is assigned.

j) For USA-coded unregistered beacons without a craft ID, the destination for a NOCR (associated with a located alert) is based on beacon type, per item g.

k) For non-USA-coded beacons, the destination (and SRR) for unlocated alerts and the destination for NOCRs is based on the country code of the beacon ID. Related contact information is provided on the C/S Contact Lists web page (select "SPOC") for non-SSAS beacons. The destination for unlocated alerts and NOCRs for non-USA-coded beacons associated with countries in the USA service area is provided in Annex 14.

While the SRR and BUFFER(s) generally indicate the message destination(s) and responsible SAR agency, the following exceptions apply:

1) Due to space limitations on the RCC message, only three SRRs are listed per location. The Supporting Information section of the RCC message may list message destinations for additional SRRs not identified in "SRR/BUFFER(s)". Note that destinations that receive an alert message based on the USMCC "echo" capability are not identified in the Supporting Information section.

2) DOA, Doppler, or encoded location are irrelevant for SSAS beacons, since the message destination (i.e., competent authority) for SSAS beacons is based on the country coded in the 406 MHz beacon ID. The Message Header section of the RCC message indicates if the beacon type is "Ship Security." Alerts for ship security beacons normally are only sent to the competent authority. Alerts for USA ship security beacons may be sent to other RCCs, if requested by the USA competent authority.

3) Alerts are routed specially for USA special program beacons, either in addition to normal routing or instead of normal routing. The Beacon Decode section of the RCC message indicates if a beacon is part of a special program, as described in Section 3.3.3. Field THIS ALERT MESSAGE IS BEING SENT TO lists the destinations to which the USMCC has sent the alert message, as described in Section 3.5.2.

4) NOCR alerts are sent to the country of registration (as coded in the 406 MHz beacon ID) when an alert with location is not located in the SRR of that country, so that the country of registration can help with the

SAR response for its citizens. Since the SRR is based on the location, the NOCR destination will not be listed as the SRR. The SIT number (178 or 378) and message name (NOTIFICATION OF COUNTRY OF REGISTRATION) in the Message Header indicate that an alert message is an NOCR.

Caution: If an NOCR is sent for a MEOSAR alert and the location is serviced by an L/G only capable MCC, then the alert may not be sent to the responsible RCC, since it usually requires manual effort for an L/G only capable MCC to distribute a MEOSAR alert to an RCC. In such a case, the USA RCC receiving the NOCR may need to take additional action to ensure that the responsible RCC has received the alert for a USA-coded beacon.

A list of MCCs, including information on MCC capability is provided in Annex 3. The current list of MCC capability is provided on this C/S web site:

https://cospas-sarsat.int/en/system/detailed-leosar-geosar-system-description/mcc-configuration

Note that the list on C/S web site is updated more frequently than this document.

5) Once an alert message is sent to a destination for an activated beacon, that destination will receive subsequent alerts for the alert site until position is confirmed, regardless of location. This allows message destinations to coordinate a SAR response, as needed.

6) After position is confirmed, the destination in whose area the MCC Reference Position lies will normally receive subsequent alerts for the alert site, regardless of the location of subsequent alerts (i.e., alerts sent after the alert used to confirm the beacon position). If the MCC Reference Position is not in the SRR for the alert site, then that destination is normally removed from the distribution list after position is confirmed, unless distribution is not based on location, as occurs for SSAS beacons (per item 2) and some USA special program beacons may be sent to a designated destination regardless of alert location (per item 3).

If a destination is removed from the distribution list (as evidenced by the SRR and BUFFER fields associated with the MCC Reference Position), it may request the USMCC Controller to add it to the distribution list for subsequent alert. For example, being added to the distribution list after position confirmation may be valuable for an USA RCC that wants to help coordinate the SAR response for a USA beacon with a MCC Reference Position outside of the USA SRR.

7) When the USMCC Controller manually resends an alert message to another RCC due to a request by the RCC, the SRR on the resent message will be the same as on the initial alert.

8) If an unlocated alert is distributed to two destinations based on the presence of two SRRs in the RGDB for the beacon, then the order of the destinations in the SRR and BUFFER fields is arbitrary. Refer to the "PRIMARY SRR" and "SECONDARY SRR" in the Beacon Registration section to determine which SRR (destination) is primary, based on the Home Port, Airport, or Home Address in the RGDB.

9) When position is confirmed for an RLS beacon, the new alert is sent to the MCC associated with the RLS Provider (RLSP) for the beacon, in addition to normal distribution. As indicated in document C/S A.001, the FMCC is the associated MCC for RLS beacons that use the Galileo (EUMETSAT) satellite

constellation to send return link information to beacons. After position confirmation, an alert is also sent to the MCC associated with the RLSP when:

a) the beacon message indicates that the beacon has received an acknowledgement from the RLSP, or

b) the beacon message indicates that the beacon has not received an acknowledgement from the RLSP (after receipt of an acknowledgement from the RLSP).

10) When an unlocated alert is sent as a Detection Update (SIT 177 or 377) to an RCC or SPOC for a site without MCC Reference Position data, the SRR in the New Alert section is based only on the destinations for the current alert, not the previous message destinations; the Supporting Information section contains the previous message destinations.

11) If an alert is located outside of an SRR but within 50 km of its boundary (where 50 km is the default buffer size in the USMCC), and no buffer area is designated for the SRR, then the SRR is listed as a buffer (i.e., in field BUFFER or BUFF_2) but not listed as a message destination in Supporting Information, since the alert is not sent to the SRR. For example, if an alert location is in the TTSP SRR and within 50 km of the VZMCC SRR (which does not have a designated buffer area), then BUFFER lists VZMCC but the alert is not sent to the VZMCC.

While no information on the RCC alert message explicitly assigns the SAR Mission Coordinator (SMC), the RCC receiving an alert message should take action to ensure that the possible distress is resolved.

3.2.3.9 Alert Data Distribution Procedures for DOA Position

A DOA position is computed by a MEOLUT using differences in Time of Arrival (TOA) and/or Frequency of Arrival (FOA) data from multiple MEOSAR satellites. A new alert with DOA location is distributed when DOA location is first received. A subsequent (new) alert with DOA location is distributed when one of the following conditions is met:

1) Before or after position confirmation for a beacon other than an ELT(DT), the new DOA location has improved an expected (horizontal) error:
   - Less than 150 NM (277.8 km),
   - At least 2 NM (3.7 km) less than lowest previously sent DOA expected error (FGBs),
   - At least 1.9 NM (3.5 km) less than lowest previously sent DOA expected error (SGBs), and
   - At least 50% less than lowest previously sent DOA expected error.
2) The new DOA location enables position confirmation. As noted in Section 3.2.2.1, position confirmation for 2 DOA positions requires:
   - Each DOA alert to include data from one satellite not included on the other alert and there is at least a 2-second time separation in some portion of time period associated with each DOA position or
   - The last detect time for the two DOA alerts differs by at least 30 minutes.

Position can also be confirmed by DOA position, with Doppler or encoded position, as described in Section 3.2.2.1.

3) Before position confirmation, 5 minutes has expired since previous DOA alert and the time of the latest beacon burst used to compute the new DOA position is more than 5 minutes after the time of the latest beacon burst used to compute all previously sent DOA positions for a non-ELT(DT).

4) Before position confirmation, the new DOA position is a position conflict (vs. 20-km threshold) for a non-ELT(DT). For an ELT(DT), a position conflict can only occur between the DOA position and encoded position in the same alert, since position in a previously received alert is not referenced in the processing of a new ELT(DT) alert.

5) After position confirmation, the new DOA position matches the MCC Reference Position (vs. 20-km threshold) and the time of the latest burst used to compute the new DOA position is at least 15 minutes from the time of the latest beacon burst used to compute each previously sent DOA position that matched the MCC Reference Position.

6) After position confirmation, the new DOA position is a position conflict and the time of the latest burst used to compute the new DOA position is at least 10 minutes from the time of the latest beacon burst used to compute each previously sent DOA position conflict alert.

7) For an ELT(DT), within 30 seconds of activation, the detect (reference) time of the new alert:

   a) differs by at least three (3) seconds from the reference time for all previously sent alerts; or

   b) differs by at least three (3) seconds from the reference time for all previously sent alerts with DOA position and the new alert contains DOA position; or

   c) differs by at least three (3) seconds from the reference time for all previously sent alerts with refined encoded position and the new alert contains refined encoded position (FGBs only); or

   d) differs by at least three (3) seconds from the reference time for all previously sent alerts with encoded position and the new alert contains encoded position.

   Note that DOA position will only be provided for ELT(DT)s if the MEOLUT is commissioned for fast-moving beacon location accuracy, and that associated C/S specifications are not finalized.

8) For an ELT(DT), if an alert has been received with a more recent detect time than the most recent detect time sent and 10 minutes have past since the previous alert was sent, then the best new solution is sent, per the following criteria (listed from highest to lowest priority):

   a) The alert with the most recent detect time and GNSS (encoded) position, if an alert is available with GNSS position and a detect time more recent than the most recent detect time sent

   b) The alert with the most recent detect time and DOA position, if an alert is available with DOA position and a detect time more recent than the most recent detect time sent

c) The alert with the most recent detect time, if an alert is available with a detect time more recent than the most recent detect time sent.

9) For an ELT(DT), based on service area information available to the MCC, the new alert contains DOA or encoded position located in an area for which the associated MCC or associated distress authority has not previously been sent an alert. Since position is not confirmed for ELT(DT), the distribution list for an ELT(DT) activation may increase indefinitely if the aircraft moves into new SRR areas.

3.2.3.10 Warning When the MCC Reference Position is Re-Established

When the USMCC re-establishes the MCC Reference Position, as described in Section 3.2.2.2.1, a warning is provided in the associated SIT 175 or 375 alert message, immediately after the new solution, as shown in Table 3.2.12. This warning indicates that the MCC Reference Position computed by the USMCC has changed significantly (probably by more than 20 km), which means that the RCC SAR plan may need to be altered.

Table 3.2.12: Sample Extracted Portion of SIT 175 Alert Message Sent When the MCC Reference Position is Re-Established

```
**** 406 BEACON POSITION UPDATE ****

BEACON ID: 2DD42 EA43F 81FE0      SITE ID: 98592

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
43 49.0N 069 52.1W  000.4 HRS  CGD01

**** POSITION UPDATED FROM THE FOLLOWING ALERT ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  N/A D  43 49.0N  069 52.1W  09 221233 APR MEO 012 FMCC

WARNING: MCC REFERENCE POSITION RE-ESTABLISHED USING ONLY NEW DATA
DETECTION FREQUENCY: 406.0277 MHZ
```

3.2.4 Detection Frequency, First Detect Time, and DOA Altitude

3.2.4.1 Detection Frequency

The DETECTION FREQUENCY format is 406.nnnn MHz and provides the detected frequency of the transmitting 406 MHz beacon to a precision of tenths of a Hz (nnnn), as shown in Table 3.2.13. It is provided for the new solution, if available, or a previous solution, if the data is not available in the new solution. The value "NOT AVAILABLE" is reported when the frequency is not available in the new or a previous solution (see Table 3.2.14). The frequency may be unavailable because:

a) it was not provided by the reporting LUT or MCC, or

b) the solution was from a LEOSAR satellite without Doppler location or one/multiple MEOSAR satellites without DOA location, in which case the reported frequency is unreliable since it includes a Doppler shift of unknown magnitude.

This field is not present on the Missed Detection (SIT 176 or 376) message. The detection frequency for an SGB is typically near 406.050 MHz, the center frequency for the "spread-spectrum" distribution of SGB transmissions that are spread across the 406 MHz frequency band.

Table 3.2.13: Sample Solution Data with actual Detection Frequency and Information on Doppler Position Data Accuracy

```
**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL  LATITUDE  LONGITUDE DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
61   N/A A   01 22.2N  103 59.9E 18 130255 FEB S10 006 VNMCC  SIMCC
39   N/A B   08 29.5N  135 58.9E 18 130255 FEB S10 006 VNMCC  MARSEC

DETECTION FREQUENCY: 406.0281 MHZ
HIGH PROBABILITY THAT THE NEW DOPPLER POSITION DATA IS ACCURATE WITHIN 5 KM
```

Table 3.2.14: Sample Solution Data without Detection Frequency

```
**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A                 18 123721 JAN S12 002 SPMCC  AKRCC

DETECTION FREQUENCY: NOT AVAILABLE
```

Per Table H.2 in document C/S T.012, the frequencies in the range of 406.025 to 406.040 MHz are assigned for C/S operational FGBs. There is a 3-KHz separation between allocated frequency bands (e.g., 406.025 MHz, 406.028 MHz, 406.031 MHz are allocated) to help prevent beacon signals from being lost due to collisions of transmissions from beacons operating in the same frequency band. Frequency 406.022 MHz is reserved for C/S system reference (non-operational) beacons. Per document C/S R.018, frequencies 406.061 MHz and 406.064 MHz are used for MEOSAR Development and Evaluation (D&E) tests involving FGBs, to avoid conflict with the C/S operational system. Frequencies above 406.060 MHz are also used to transmit signals for various reference beacons, including buoy beacons managed by USA/NOAA that transmit at 406.067 MHz.

The Detection Frequency can be used to help determine whether an alert originated from an operational beacon. While controlled tests (including MEOSAR D&E tests) and reference beacons transmissions normally involve test-coded beacons (for which alerts are automatically filtered from operational distribution), rapid transmission through the SARP-3 on satellite S13 (or corruption of beacon signals as received by SARSAT satellite or by MEOLUTs) may cause test or reference beacon signals to be treated as operational alerts with an unreliable beacon ID. In short, an alert with an unreliable beacon ID, reported frequency above 406.060 MHz, and Doppler or DOA location near the site of a MEOSAR D&E or reference beacon simulator (including Hawaii) is likely the result of a test transmission, not an operational beacon. Note that the Hawaii beacon simulator transmits at frequency 406.040 MHz in normal mode; that is, when it is not used for controlled tests. The USA operates beacon simulators in Hawaii, Florida, and Maryland, and buoy beacons in Hawaii, Oregon (Columbia River), and southern Maryland.

The Detection Frequency can also be used to help correlate an alert site for an unreliable FGB ID with another alert site with a reliable FGB ID in the same vicinity. If the two detection frequencies are within the same 3-KHz band (e.g., near 406.037 MHz plus or minus 1.5 KHz), then it is more likely that the two alert sites in the same vicinity are from the same beacon than if the frequencies are in different 3-KHz bands (e.g., 406.0312 MHz and 406.0375).

3.2.4.2 First Detect Time

The first DETECT TIME for a MEOSAR solution. The first detect time is not provided for LEOSAR or GEOSAR solutions or in the Previous Message section. See the sample message in Table 3.2.15.

3.2.4.3 DOA Altitude

The MEOLUT normally computes an altitude when it computes the DOA position. When available, the altitude associated with the DOA position is provided in meters from mean sea level, as shown in Table 3.2.15. The DOA altitude is currently provided only on alert messages sent to USAF RCCs (including the AFRCC and the AKRCC). The altitude is provided with a note saying “CAUTION: NOT VALIDATED,” because it is auxiliary information that is not verified as part of MEOLUT commissioning.

Table 3.2.15: Sample First Detect Time and DOA Altitude

```
**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  006 D  08 29.87N 135 58.93E 15 190239 JUL MEO 004 HI_MEO MARSEC

DETECTION FREQUENCY: 406.0373 MHZ
FIRST DETECT TIME: 15 190239 JUL
ALTITUDE OF DOA POSITION: 45 METRES.  CAUTION: NOT VALIDATED
```

3.2.5 Information on Doppler/DOA Position Data Accuracy

3.2.5.1 Information on Doppler Position Data Accuracy

The statement HIGH PROBABILIY THAT THE NEW DOPPLER POSITION DATA IS ACCURATE WITHIN 5 KM is provided when all technical parameters for the new Doppler position data are "nominal," as described in document C/S A.002, Appendix B.1 to Annex B, Message Field 61. This statement roughly means that there is a 95% probability that the new Doppler position is accurate within 5 km (about 2.7 NM), based on the requirement (per document C/S T.005) that nominal Doppler solutions are accurate within 5 km in 95% of cases.

The statement NEW DOPPLER POSITION ERROR MAY EXCEED 5 KM DUE TO TECHNICAL PARAMETERS is provided when any associated technical parameter is not nominal, as described above. These technical parameters include the number of beacon bursts, satellite geometry, and the reliability of beacon frequency measurements.

The statement NEW DOPPLER POSITION ERROR MAY EXCEED 10 KM DUE TO SATELLITE MANEUVER is provided when the maximum expected error in Doppler location exceeds 10 kilometers during the 24-hour period after a satellite maneuver; when this statement is provided, no information is provided about whether the associated technical parameters are nominal.

The statement NEW DOPPLER POSITION DATA SUSPECT – OUTSIDE REPORTING SATELLITE FOOTPRINT is provided if the USMCC determines that either the A or B Doppler position is outside the footprint of the reporting satellite for the solution at the reported detect time (TCA).

Table 3.2.16 provides a sample that includes information on Doppler position data accuracy.

3.2.5.2 Information on DOA Position Data Accuracy

The statement NEW DOA POSITION DATA SUSPECT – OUTSIDE REPORTING SATELLITE FOOTPRINT is provided if the USMCC determines that the DOA position is outside the footprint of any reporting satellite for the solution. Field EE (Expected Horizontal Error) also provides information on the DOA position accuracy, as described in Section 3.2.3.2.

Per the MEOLUT commissioning specification (document C/S T.020), the current MEOLUT location accuracy requirements (i.e., requirements for Early Operational Capability) are:

- Single burst: 70% within 5 km (about 2.7 NM); and 90% within 10 km (about 5.4 NM)
- Multiple burst: 95% < 5 km and 98% < 10 km, within 20 minutes.

Section 3.2.3.5 contains information on single burst and multiple burst solutions.

To date, MEOLUT commissioning for location accuracy has been based on transmissions from stationary beacons. Analysis performed by the USA and others indicates that the DOA position is not as accurate for

moving beacons as it is for static beacons, including beacons moving in the ocean due to waves or currents. As noted in Section 3.2.3.2, C/S MEOLUT providers are working to improve the DOA position accuracy and expected error reliability for moving beacons.

3.2.6 Doppler Image Position Determination

When one Doppler position (A or B) in the new alert is determined to be an "image" (that is, not the actual position), then a data line is included to the alert message about the "LIKELY IMAGE POSITION" as per the following example. This data line is only provided when a Doppler position is determined to be an image prior to position confirmation.

The image position is determined when a beacon was previously detected as a LEOSAR or GEOSAR unlocated alert, and one of the Doppler positions was not visible to the satellite when it detected the unlocated alert, per the "LEOSAR Image Position Determination" algorithm in document C/S A.002 (Appendix B.2 to Annex B). The reported A/B probability is irrelevant to image position determination. When one Doppler position is determined to be an image, it does not imply that the other Doppler position is the real position, since both Doppler positions could be incorrect. A Doppler position is determined to be real based on a match within 20 km to an independent DOA, Doppler or encoded position, regardless of image position determination.

Table 3.2.16: Sample Solution Data with Likely Image Position

```
**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
55   N/A A  08 29.5N  135 58.9E  15 130256 JAN S13 009 ARMCC  MARSEC
45   N/A B  01 22.2N  103 59.9E  15 130256 JAN S13 009 ARMCC  SIMCC

DETECTION FREQUENCY: 406.0281 MHZ
HIGH PROBABILITY THAT THE NEW DOPPLER POSITION DATA IS ACCURATE WITHIN 5 KM
LIKELY IMAGE POSITION: THE A POSITION
```

3.2.7 Uncorroborated (Suspect) MEOSAR Alerts

On occasion, MEOLUTs generate "suspect" alerts; that is, alerts generated based on a single beacon burst detected by one satellite with no corroborating detections; receipt of the same burst from the same satellite via multiple antennas is not considered to be corroboration, unless at least one of the source MEOLUTs does not receive antenna data from any other MEOLUT. A significant portion of uncorroborated MEOSAR alerts appear to be system-generated anomalies; that is, the alert does not correspond to a transmission from a beacon with the reported beacon ID. Section 3.2.7.1 provides analysis of uncorroborated MEOSAR alerts. The occurrence of uncorroborated MEOSAR alerts has decreased significantly since a problem with data shared ("networked") between USA MEOLUTs was fixed in late May 2018.

The USMCC distributes uncorroborated MEOSAR alerts as shown in Table 3.2.17. A MEOSAR alert is identified as "uncorroborated" when the alert is based on a single satellite detection and no previous alert was generated for the alert site (beacon activation), per the sample in Table 3.2.18.

Table 3.2.17: Rules for the Distribution of Uncorroborated MEOSAR Alerts

Destination Type (Beacon Country - Registration Status)	Distribute Alert?
LEOSAR/GEOSAR/MEOSAR capable MCC	Yes
LEOSAR/GEOSAR only capable MCC	No*
RCC and SPOC (USA beacon - registered**)	Yes
RCC and SPOC (USA beacon - not registered**)	No*
RCC (non-USA beacon with encoded position in the USA SRR or a non-USA SRR for which an RCC receives alerts)	Yes
RCC (non-USA beacon with no encoded position)	No*

**Regardless of other criteria, the USMCC distributes an uncorroborated MEOSAR alert if:*

a) the source MEOLUT has met commissioning requirements for processing anomalies (i.e., if the MEOLUT generates an acceptably low rate of anomalous alerts); or

b) the beacon is an ELT(DT), in accordance with the requirement in document C/S A.001 to distribute uncorroborated MEOSAR alerts to SAR authorities and the LADR.

***In this context, a beacon is "registered" if it is in the USA RGDB, in a USA special program or if it has an encoded "Craft ID" (i.e., a vessel or aircraft ID).*

The destination for a MEOSAR uncorroborated alert with encoded position based on the encoded position may differ from the NOCR destination. As a result, the "Alert Distribution Action" could be "Yes" for one destination and "No" for another destination. Two examples follow:

1) An uncorroborated alert is received (from a MEOLUT that has not met commissioning requirements for processing anomalies) for an unregistered USA-coded beacon with encoded position in the service area of the LGM capable FMCC. The alert will be sent to the FMCC but not sent to a USA RCC. The USMCC or USA RCC could provide the registration status if requested.
2) An uncorroborated alert is received (from a MEOLUT that has not met commissioning requirements for processing anomalies) for a Mexico-coded beacon with encoded position in the CGD07 SRR. The alert will be sent to CGD07 but not sent to the Mexico SPOC. In this case, CGD07 may contact the Mexico SPOC to request beacon registration information.

When a MEOSAR alert is identified as uncorroborated (per the sample in Table 3.2.18), RCCs should proceed with caution since the beacon ID and/or associated encoded position may be unreliable.

The validity of uncorroborated MEOSAR alerts can be substantiated by the presence of corroborating information, such as:

a) another alert for the same beacon ID;
b) beacon registration data for the specific beacon ID;

c) an encoded vessel or aircraft ID (per the Beacon Decode section below);
d) if the TAC number is provided in the Beacon Decode section (see Section 3.2.7.1), the allocation of the encoded C/S TAC number and correlation between the beacon type indicated on the alert message and the beacon type(s) designated for the associated TAC number. Relevant information for "Type Approval Certificate Numbers" is located on the C/S website at https://www.cospas-sarsat.int/en/beacons-pro/experts-beacon-information/approved-beacon-models-tacs; or
e) correlation between the reported DETECTION FREQUENCY (if available) and the detection frequency for the beacon model (associated with the TAC number provided in the Beacon Decode section).

For an alert site previously identified as uncorroborated (per the sample in Table 3.2.18), if a new alert is sent, then the alert site is no longer considered to be uncorroborated, since the initial alert has been corroborated. If the first alert was uncorroborated and sent as a NOCR, then the corroborating alert may also be sent as a NOCR.

While uncorroborated LEOSAR or GEOSAR alerts with a single detection (i.e., NUM = 1) are not identified as "uncorroborated" in the alert message, the validity of these single detection alerts can also be substantiated by the presence of corroborating information, as detailed above. However, with respect to item a), the USMCC does not distribute a new alert after a single-detection LEOSAR or GEOSAR alert is sent simply to corroborate the first alert, but the RCC may contact the USMCC to determine if another alert was received for the same beacon ID that was not distributed. In addition, the DETECTION FREQUENCY is never provided for LEOSAR alerts without Doppler location, as described in Section 3.2.4.1.

Table 3.2.18: Sample Uncorroborated MEOSAR Alert

```
**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A E  08 29.87N 135 58.93E 15 130201 JUL MEO 001 HI_MEO MARSEC

DETECTION FREQUENCY: 406.0375 MHZ
FIRST DETECT TIME: 15 130201 JUL
UNCORROBORATED MEOSAR ALERT
```

3.2.7.1 Analysis of Uncorroborated MEOSAR Alerts

The USMCC analyzed alert sites for USA-coded beacons closed from March 2017 through March 2018 where an uncorroborated MEOSAR alert was never corroborated by receipt of another alert for that beacon ID in the associated alert site, independent of whether alerts were distributed for the site. For these MEOSAR uncorroborated alert sites, 0 of 1461 (0.0%) sites where the USA-coded beacon ID contained an unallocated TAC number were registered (i.e., in the USA RGDB), whereas the registration rate for all USA-coded beacons is about 70%. Thus, it is very unlikely that an uncorroborated MEOSAR alert associated with an unallocated TAC number corresponds to a transmission from a beacon with the reported beacon ID.

For the same set of MEOSAR uncorroborated alert sites, 178 of 1899 (9.4%) sites where the USA-coded beacon ID contained an allocated TAC number were registered. Since the registration rate for all USA-coded beacons is about 70%, this suggests that there is about a 13% probability that an uncorroborated MEOSAR alert (never corroborated by other alert data) associated with an allocated TAC number is not a system generated anomaly. (That is, 1899 total sites * 0.70 expected registration rate = 1329 expected registrations. 178 actual registrations/1329 expected registrations = 13.4% of the expected registration rate, which suggests a system anomaly rate of 86.6%.)

From March 2017 through March 2018, the USMCC sent uncorroborated MEOSAR alerts for 13,634 sites (to RCCs and LGM capable MCCs). The USMCC sent a subsequent alert that corroborated the uncorroborated MEOSAR alert for 1,495 (11.0%) of these sites, indicating that a significant number of uncorroborated MEOSAR alerts correspond to real activations of the associated beacon ID. For example, these single detection ("suspect") uncorroborated alerts may occur for real beacon activations when the beacon is on the fringe of visibility to the MEOLUT (i.e., only one satellite with visibility to the beacon is being tracked by the MEOLUT), or the beacon has limited visibility to the sky (e.g., the beacon is located in a canyon or an aircraft hangar).

US RCCs have performed rescues where the only notification about the beacon activation was an uncorroborated MEOSAR alert, including 2 cases in 2017. As noted in Section 3.2.7, the number of uncorroborated MEOSAR alerts has decreased significantly since late May 2018.

3.2.8 Beacon Decode Information Derived from a Previous Reliable Beacon Message

If a new alert contains an unreliable beacon message (e.g., due to inconsistencies in its error correcting code) but its 15-hex beacon ID matches the 15-hex beacon ID of a previous reliable beacon message for an FGB (or its 23-hex beacon ID matches the 23-hex beacon ID of a previous reliable message for an SGB), then the new alert is incorporated into the same alert site, and the new (transmitted) alert:

a) includes Beacon Decode information derived from a previous "matching" beacon message;
b) does not include encoded position data; and
c) includes a note stating that the new beacon message is unreliable and that the Beacon Decode information provided is from a previous reliable beacon message (per the sample below).

This note provides a caution to the RCC for the rare chance that the new alert is actually from another beacon and implies that encoded position is not provided for the new alert. Sample text from an alert with Beacon Decode information derived from a previous reliable beacon message is provided in Table 3.2.19.

Table 3.2.19: Sample Beacon Decode Information Derived from a Previous Reliable Beacon Message (FGB)

```
HIGH PROBABILITY THAT THE NEW DOPPLER POSITION DATA IS ACCURATE WITHIN 5 KM
  DATA DECODED FROM THE BEACON MESSAGE IS NOT RELIABLE. BEACON
  MESSAGE DATA PROVIDED BELOW IS FROM A PREVIOUS RELIABLE BEACON MESSAGE

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: EPIRB SERIAL (STANDARD)
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: TAC 127          MODEL      :
SERIAL NUM  : 11540            HOMING     : 121.5
POSITION TYPE: INTERNAL        POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.
```

3.2.9 Warning for SGB Alerts

SGBs are being developed and tested but are not yet operational. To validate associated LUT and MCC processing, SGB tests may be performed that involve the operational distribution of alerts for SGBs. To mitigate the risk that an RCC treats an SGB alert as a distress activation, the following warning will be provided in the alert message while SGBs are in the development phase.

```
  WARNING: SECOND GENERATON BEACON (NOT OPERATIONAL)
```

3.3 Beacon Decode Information

The information in this block is decoded from the transmitted 406 MHz beacon ID, in accordance with document C/S T.001 for FGBs and document C/S T.018 for SGBs. For USA beacons, bits in the beacon ID defined for national use in C/S T.001 are decoded per the USA Beacon Coding Guide. National use information for USA beacons is further described in Section 3.3.3. Beacon decode information is provided on all alert messages except the SIT 176 and SIT 376 messages. See the sample information in Table 3.3.1.

Table 3.3.1: Sample Beacon Decode Information (No Special Program)

```
**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: EPIRB SERIAL CATEGORY I
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: ACR              MODEL      : UNKNOWN
SERIAL NUM  : 34679            HOMING     : 121.5
POSITION TYPE: NIL             POSITION RESOLUTION: 4 MINUTES

 6 IHDB record(s) found, most recent: 2020-12-25.
```

3.3.1 Beacon Decode Detailed Information

The COUNTRY field identifies the country, state, or territory associated with the beacon. It identifies the country that maintains registration information for the beacon. For USA-registered beacons, the registration data is included in most alert messages. The C/S website ("Contact Lists," sub-link "406 MHz Beacon Registers") provides Registry 24/7 Points of Contact for non-USA beacons.

The Maritime Identification Digit (MID) CODE is the 3-digit code assigned by the International Telecommunications Union (ITU) and corresponds to the COUNTRY. Multiple MID codes may be assigned to the same country; for example, 366 to 369 are assigned to the USA, as shown in Table 3.2.8.

The ITU has assigned special MIDs for use in EPIRBs where the MID does not correspond to the country of registration (see Table 3.3.2). Since there is no actual country associated with the special MID, no NOCR is sent. However, the USMCC generates an NOCR for internal destination DUMMYSRR, which is identified as a message destination in the Supporting Information section of the RCC message. Current and previous message destinations are further described in Section 3.5.2. Sample Beacon Decode Information with a special MID for an EPIRB is provided in Table 3.3.3.

Table 3.3.2: Special MIDs Assigned for Use in EPIRBs

MID Range	Country in Beacon Decode Section	Note in Beacon Decode Section of the RCC message*
974	EPIRB_AIS	MID ALLOCATED FOR EPIRB AIS
982 - 987	EPIRB_MMSI	MID ALLOCATED FOR MMSI OF CRAFT ASSOCIATED WITH A PARENT SHIP, WHERE THE TRUE MID IS DERIVED FROM MMSI DIGITS 1,2 + MID DIGIT 3

** In the "Other Information" section of a SIT 185 message.*

Table 3.3.3: Sample Beacon Decode Information with Special MID for EPIRB

```
**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : EPIRB_MMSI       BEACON TYPE: EPIRB MMSI (STANDARD)
COUNTRY CODE: 983              CRAFT ID   : 000456         SPECIFIC BEACON: 1
MANUFACTURER:                  MODEL      :
SERIAL NUM  :                  HOMING     : NIL OR NOT 121.5
POSITION DEVICE: EXTERNAL      POSITION RESOLUTION: NONE
 MID ALLOCATED FOR MMSI OF CRAFT ASSOCIATED WITH A PARENT SHIP, WHERE
  THE TRUE MID IS DERIVED FROM MMSI DIGITS 1,2 + MID DIGIT 3

 6 IHDB record(s) found, most recent: 2020-12-25.
```

BEACON TYPE shows the beacon type (i.e., EPIRB, ELT, PLB, SHIP SECURITY, TEST, or NATIONAL USER). It indicates if the beacon ID contains a serial number, which is contained in field SERIAL NUM (described below). A serial number is an arbitrary sequential number (e.g., 1, 291, 1234) that has no intrinsic meaning, and does not directly provide a reference to the vessel or aircraft associated with the beacon.

For location protocol FGBs, the values “(STANDARD)” and “(STD)” indicate Standard location protocol and “(NATIONAL),” “NATIONAL” and “(NAT)” indicate National location protocol. Standard and National location protocols are capable of being encoded with the beacon location, as described in document C/S T.001. (User protocol beacon may also contain encoded location.) While location is encoded in a common (standard) format for National location protocols, some bits in the 406 MHz beacon message are reserved for “national use”. Further information on beacon type and associated fields coded in the beacon ID is provided in Table 3.3.4.

Based on information encoded in the beacon ID, the CRAFT ID identifies the vessel or aircraft and contains the radio call sign, ship station ID, aircraft tail number (registration marking), or aircraft operator designator. It provides a reference to beacon registration data independent of the USMCC RGDB. For example, the MMSI (i.e., the 3-digit MID plus the 6-digit ship station ID) or radio call sign can be used to search the ITU maritime registration database using the following link:

https://www.itu.int/mmsapp/ShipStation/list

The SPECIFIC BEACON identifies the specific beacon on a vessel or aircraft, and allows multiple beacons on a single vessel or aircraft to be uniquely identified. This field is present for most non-serial FGB protocols. The SPECIFIC BEACON is numeric for some FGB protocols (e.g., aviation user) and is alphanumeric for other FGB protocols (e.g., radio call sign user). The title SPECIFIC BEACON and an associated value are not provided for SGBs; the specific beacon is not part of the SGB coding protocol because each SGB contains a unique Cospas-Sarsat TAC number and serial number; see the discussion of SERIAL NUM below.

The MANUFACTURER and MODEL number of the beacon are provided for serial user protocol FGBs that contain a USA country code, as specified in the USA Beacon Coding Guide. When the TSC number is coded in the beacon ID, the MANUFACTURER field contains this number in format “TAC <number>”. Cospas-Sarsat issues a TAC number for a 406 MHz beacon model that successfully completes Type Approval testing, as specified in document C/S T.007 for FGBs and in document C/S T.021 for SGBs. To determine the beacon manufacturer and model associated with a specific TAC number, use the following link:
https://www.cospas-sarsat.int/en/beacons-pro/experts-beacon-information/approved-beacon-models-tacs

The SERIAL NUM is the unique serial number of the beacon. For FGBs encoded with a 24-bit address, the 24-bit address is provided in place of the SERIAL NUM with the label 24 BIT ADDR and with the prefix “HEX=”. SGBs are always coded with a TAC number and Serial Number, which together, provide a unique ID that never changes for the beacon. For SGBs with a 24-bit address, the 24-bit address is provided in the CRAFT ID field, and is followed by the tail number when known (i.e., when 24-bit address is coded for a USA beacon). For FGBs and SGBs, the 24-bit address is always provided as 6 hexadecimal characters.

The ICAO 24-bit aircraft address is allocated to States to uniquely identify aircraft worldwide. The Appendix to Chapter 9 of the ICAO Annex 10, Aeronautical Communications document provides the worldwide scheme for the allocation, assignment and application of aircraft addresses (see C/S document G.007). For USA-coded beacons with a 24-bit address, field CRAFT ID provides the tail number. If the

country that assigned that 24-bit address is known but is not the United States, then the CRAFT ID is provided as “NONUS”.

HOMING identifies the frequency and type of homer on the beacon. The following values may occur for First-Generation Beacons (FGBs), as specified in document C/S T.001:

“121.5”

“MARITIME” (9 GHz Search and Rescue Radar Transponder (SART))

“OTHER” (other auxiliary radio locating device)

“NIL OR NOT 121.5” (only National, Standard or RLS Location Protocol beacons) and “NIL” (no auxiliary radio locating device).

For SGBs, the value is either “YES” or “NIL”.

The POSITION DEVICE indicates the type of device that the beacon uses to provide the encoded position. Possible values are INTERNAL, EXTERNAL and NIL:

INTERNAL – encoded position is provided by a device internal to the beacon

EXTERNAL – encoded position is provided by a device external to the beacon

NIL – no information is available. The beacon type is not FGB location protocol or the information was not reliably provided in the 406 MHz beacon message for this alert. The value is “NIL” for SGBs.

The POSITION RESOLUTION indicates the encoded position resolution. Table 3.2.7 provides the resolution of encoded location and the corresponding value in the POSITION RESOLUTION field, based on beacon protocol and the reliability of the 406 MHz beacon message. The field value is “NONE” if encoded position data is not available.

If available, the country (or state) that assigned the 24-bit address for an aircraft is provided, as shown in the following example:

AIRCRAFT 24-BIT ADDRESS ASSIGNED TO INDONESIA

Table 3.3.4: Beacon Types Provided in USA RCC Messages

All beacon types are for FGBs unless the beacon type indicates "SGB". There is only one protocol for encoding location in the SGB message.

Beacon Type	Location Protocol	Description/Notes
ELT 24 BIT ADDRESS (STD)	Standard	24 Bit Aircraft Address provides a reference to the aircraft. The tail number is provided in field CRAFT ID for USA-coded beacons with this protocol.
ELT A/C OPERATOR (STD)	Standard	Aircraft Operator is provided in field CRAFT ID. Aircraft operator designators are provided in the ICAO airline designators document published as ICAO document "8585 – Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services". These designators are three-letter codes like BAW for British Airways or QFA for QANTAS. Field SERIAL NUM provides the serial number for the aircraft operator.
ELT AVIATION USER	No*	Aircraft tail number is provided in field CRAFT ID. Field SPECIFIC Beacon Identifies beacon number on the aircraft.
ELT RETURN LINK	RLS	Field SERIAL NUM provides the serial number. The beacon has return link capability
ELT SERIAL (NATIONAL)	National	Field SERIAL NUM provides the serial number.
ELT SERIAL (STANDARD)	Standard	Field SERIAL NUM provides the serial number.
ELT SERIAL A/C 24BIT ADD	No*	24 Bit Aircraft Address provides reference to the aircraft. The tail number is provided in field CRAFT ID for USA-coded beacons with this protocol.
ELT SERIAL A/C OPERATOR	No*	Aircraft Operator is provided in field CRAFT ID; see "ELT 24 BIT ADDRESS (STD)" above. Field SERIAL NUM provides the serial number for the aircraft operator.
ELT SERIAL AVIATION	No*	Field SERIAL NUM provides the serial number.
ELTDT A/C ADDRESS A/C DESIGNATOR SERIAL RETURN LINK	ELT(DT)	Distress Tracking ELT. If a beacon is coded with the 24 Bit Aircraft Address protocol, this field provides a reference to the aircraft and the tail number provided in field CRAFT ID for USA-coded beacons. If an ELT(DT) is coded with Aircraft Designator, then field AIRCRAFT OPERATOR DESIGNATOR (3LD) will provide the 3-character Aircraft Designator. Field SERIAL NUM provides the serial number for an "ELTDT SERIAL" beacon.
EPIRB MARITIME USER	No*	Field CRAFT ID contains the Ship Station ID or the radio call sign, as described in this table for "EPIRB MMSI (STANDARD)" and "EPIRB RADIO CALL SIGN," respectively.

Beacon Type	Location Protocol	Description/Notes
EPIRB MMSI (STANDARD)	Standard	Field CRAFT ID contains trailing 6 digits of the 9-digit Ship Station ID number, which is one form of MMSI (Maritime Mobile Service Identity). The first 3 digits of the Ship Station ID number are the Maritime Identification Digits (equivalent to country code).
EPIRB RADIO CALL SIGN	No*	Field CRAFT ID contains the Radio Call Sign, which provides a reference to the associated vessel. The first 3 digits of a radio call sign identify its country of registration.
EPIRB RETURN LINK MMSI	RLS	Field CRAFT ID contains trailing 6 digits of the 9-digit Ship Station ID number, which is one form of MMSI (Maritime Mobile Service Identity). The first 3 digits of the Ship Station ID number are the Maritime Identification Digits (equivalent to country code). The beacon has return link capability.
EPIRB RETURN LINK	RLS	Field SERIAL NUM provides the serial number. The beacon has return link capability
EPIRB SERIAL (NATIONAL)	National	Field SERIAL NUM provides the serial number.
EPIRB SERIAL (STANDARD)	Standard	Field SERIAL NUM provides the serial number.
EPIRB SERIAL CATEGORY I	No*	The beacon can be activated manually or automatically. Corresponds to a “float free” EPIRB per document C/S T.001.
EPIRB SERIAL CATEGORY II	No*	The beacon can only be activated manually. Corresponds to a “non-float free” EPIRB per document C/S T.001.
NATIONAL USER	Undefined	Specific information that may be encoded in the beacon ID, such as beacon type and location, is defined nationally. Information defined nationally (i.e., for “national use”) will probably not be decoded by foreign MCCs; e.g., national use information in a USA coded beacon will probably not be decoded by the Canada MCC (CMCC) when it backs up the USMCC.
PLB RETURN LINK	RLS	Field SERIAL NUM provides the serial number. The beacon has return link capability
PLB SERIAL	No*	
PLB SERIAL (NATIONAL)	National	
PLB SERIAL (STANDARD)	Standard	
SGB ELT	SGB	SGB ELT
SGB ELT RETURN LINK TEST	SGB	Test return link SGB ELT, per document C/S T.018**.
SGB ELTDT	SGB	Distress Tracking SGB ELT
SGB EPIRB	SGB	SGB EPIRB
SGB EPIRB RETURN LINK	SGB	Return link SGB EPIRB
SGB EPIRB RLS TEST	SGB	Test return link SGB EPIRB, per document C/S T.018**
SGB PLB	SGB	SGB PLB
SGB [TYPE-1] TEST	SGB	SGB test beacon, where “[Type-1]” is “ELT,” “ELTDT,” “EPIRB,” or “PLB”

Beacon Type	Location Protocol	Description/Notes
SGB SYSTEM BCN RLS TEST	SGB	Test return link SGB system beacon, per document C/S T.018**
SHIP SECURITY	Standard	Contains Standard location protocol. The beacon can only be activated manually. Field CRAFT ID contains trailing 6 digits of the 9-digit Ship Station ID number; see "EPIRB MMSI (STANDARD)".
TEST	Undefined	Alerts for test beacons are normally not distributed, but may be distributed as part of a controlled test. Specific information may be encoded in the beacon ID that is defined nationally, such as beacon type and location.
TEST RETURN LINK	RLS	Test return link beacon, per document C/S T.001**.
TEST RETURN LINK MMSI	RLS	Test return link beacon with MMSI, per document C/S T.001**.
TEST SERIAL (STANDARD)	Standard	Alerts for test beacons are normally not distributed, but may be distributed as part of a controlled test. Contains Standard location protocol.

** User Protocol; may contain encoded location as described in Section 3.2.3.4.*
*** Per C/S document A.001, alerts for test return link beacons are normally exchanged between MCCs and sent to the Return Link Service Provider (RLSP), but not normally sent to SAR authorities*.

3.3.2 Beacon Decode Information for Return Link Service (RLS) Beacons

The RLS provides notification to a 406 MHz beacon that an alert transmitted by the beacon has been detected by a LUT and distributed via the Cospas-Sarsat MCC network to the designated RLSP and to SAR authorities. This service is intended to provide information to persons in distress about the disposition of the SAR effort, and is only available for 406 MHz beacons coded to provide a return link. If a beacon is coded to provide a return link, then this capability is identified in the beacon type, as described in Table 3.3.4.

Per C/S procedures, an alert is not sent to the RLSP until the beacon position is confirmed. In addition, a subsequent alert is sent to the RLSP after position confirmation if the beacon Return Link Message (RLM) receipt status has changed; in particular, when new information in the beacon message indicates that the beacon has received the RLM message

Beacon decode information specific to RLS beacons is provided in the alert message after the general beacon decode information, as shown in the example below. The RLS PROVIDER indicates which satellite constellation that provides the return link service, and is listed as GALILEO, GLONASS or UNKNOWN. GLONASS satellites are provided by Russia.

If the beacon message indicates that the RLS beacon is capable of receiving an automatic acknowledgement from the RLSP, then the alert message includes a line with this format:

"RLM TYPE-1 XXXXXXXX (AUTOMATIC ACKNOWLEDGEMENT)"

where XXXXXXXX is "RECEIVED" if the beacon has received an automatic acknowledgement or "CAPABLE" if the beacon has not received an automatic acknowledgement.

If the beacon message indicates that the RLS beacon is capable of receiving a manual acknowledgement from the RLSP, then the message includes a line with this format:

"RLM TYPE-2 XXXXXXXX (MANUAL ACKNOWLEDGEMENT)"

where XXXXXXXX is "RECEIVED" if the beacon has received a manual acknowledgement or "CAPABLE" if the beacon has not received a manual acknowledgement. To date, Cospas-Sarsat has not agreed to support RLS manual (Type-2) acknowledgements.

Note that if a C/S Type Approval number is provided for an RLS FGB (i.e., in field "TAC" in Table 3.3.5), this number is derived by adding a fixed value per beacon type (1000 for EPIRBs, 2000 for ELTs, and 3000 for PLBs) to the numeric value encoded in the beacon message.

Table 3.3.5: Sample Beacon Decode Information for RLS Beacon (FGB)

```
**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : FRANCE           BEACON TYPE: PLB RETURN LINK
COUNTRY CODE: 227              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: TAC 3002         MODEL      :
SERIAL NUM  : 135              HOMING     : 121.5
POSITION DEVICE: INTERNAL      POSITION RESOLUTION: 4 SECONDS

RLS PROVIDER: GALILEO
RLM TYPE-1 RECEIVED (AUTOMATIC ACKNOWLEDGEMENT)

 6 IHDB record(s) found, most recent: 2020-12-25.
```

3.3.3 Beacon Decode Information – Activation Type

If available in the beacon message, the means by which the beacon was activated is provided in field ACTIVATION TYPE. The specified values for Activation Type are:

- UNKNOWN
- MANUAL
- "AUTOMATIC BY BEACON"
- "AUTOMATIC BY BEACON (G-SWITCH/PROBABLE CRASH)"
- "AUTOMATIC BY EXTERNAL MEANS (AVIONICS)"

The last two values are specific to ELT(DT)s. SSAS beacons can only be activated manually. "UNKNOWN" indicates that the activation method is either automatic or manual. In the case where "UNKNOWN" is provided in the RCC message, "AUTOMATIC OR MANUAL" would be provided on the SIT 185 message for the same alert.

3.3.4 Beacon Decode Information – Additional Craft Identification Information

For an FGB ELT(DT), the three-letter aircraft operator designator (3LD) is provided with the title "AIRCRAFT OPERATOR DESIGNATOR:" if the 3LD is available. If the 3LD for an ELT(DT) is "ZGA," it means that the 3LD is not available, and this text would be provided:

AIRCRAFT OPERATOR DESIGNATOR: ZGA (AIRCRAFT OPERATIOR NOT AVAILABLE)

Note that alert data for an ELT(DT) can only be entered in the LADR if there is an associated 3LD; the dummy value "ZGA" is allocated to enable ELT(DT) alert data to be entered in the LADR when the associated aircraft does not have a 3LD.

When the type of Craft (Vessel) ID is available for an SGB, field CRAFT ID TYPE and a second Craft ID field will be added to the Beacon Decode section, as described in Table 3.3.6. As for FGBs, the primary Craft ID for an SGB is provided in field CRAFT ID.

Table 3.3.6: Additional Craft ID Information for SGBs

CRAFT ID TYPE	2d Craft ID Title	Note
MMSI	EPIRB-AIS ID	If available, the EPIRB-AIS ID is provided in the format "974 NNNN," where 974 is fixed and NNNN is a 4-digit number encoded in the SGB message, which corresponds to the last four digits of the 9-digit AIS number; see the description of AIS NUMBER in Section 3.4.2.1. NNNN is zero-filled; e.g., encode value 234 is shown as "0234"
RADIO CALL SIGN	N/A	A second Craft ID is not available
TAIL NUMBER	N/A	A second Craft ID is not available
24 BIT ADDRESS	AIRCRAFT OPERATOR DESIGNATOR	Second Craft ID Title and three-letter aircraft operator designator provided, when available.
AIRCRAFT OPERATOR	AIRCRAFT OPERATOR SERIAL NUMBER	Serial number for the Aircraft Operator
SYSTEM TEST	N/A	Alerts for System test beacons are normally not sent to RCCs, but may be sent as part of a controlled system test.

The following example shows additional Craft ID information for an SGB with Craft ID type MMSI.

CRAFT ID TYPE: MMSI

EPIRB-AIS ID: 974 0123

3.3.5 Beacon Decode Information for Special Programs

Based on official agreements between NOAA and USA Government agencies, NOAA allocates groups of national use protocol 406 MHz beacons with a USA country code to a special program, as described in the USA Beacon Coding Guide. For many of these special programs, associated 406 MHz beacons are registered in the Joint SARSAT Electronic Tracking System (JSETS), a beacon registration database maintained by the Department of Defense for beacons used by the USA military. To date, NOAA has not allocated any national use SGBs to a special program.

Table 3.3.7: Sample Beacon Decode Information (Special Program)

```
**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: PLB SERIAL (NATIONAL)
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER:                  MODEL      :
SERIAL NUM  : 2336             HOMING     : NIL OR NOT 121.5
POSITION DEVICE: INTERNAL      POSITION RESOLUTION: 2 MINUTES

PROGRAM: XXX                   PROGRAM BLOCK REGISTRATION ID: XXXXXXXX81FE0

 6 IHDB record(s) found, most recent: 2020-12-25.
```

The name of the special program associated with the beacon ID is provided in PROGRAM, as shown in Table 3.3.7. If PROGRAM is set to "SEE JSETS," then the beacon ID is registered in JSETS but is not part of a group of special program beacons allocated by NOAA. If alerts for the beacon ID are distributed for a test coordinated with the USMCC (i.e., a test that involves a USA-coded beacon per Table 3.2.11 or a beacon located in the USA SRR), PROGRAM is set to "BEACON TEST XXX…," where "XXX…" describes the specific beacon test. The data line that contains PROGRAM is only included in the alert message if PROGRAM information is available.

PROGRAM BLOCK REGISTRATION ID contains the 15-hexadecimal beacon ID that is linked to Beacon Registration Data for a special program.

If the Program Block Registration ID is set to 000000000000001, then:

1) available registration information for the specific beacon ID in the USMCC RGDB is provided in the alert message (see Section 3.1.4) and

2) the next line of the alert message (just prior to "USMCC Registration" data) indicates:

*** SEE JSETS: BEACONS FOR THIS PROGRAM ARE REGISTERED IN JSETS ***

US military beacons should be registered in JSETS and not in the Registration Database maintained by the USMCC/NOAA (RGDB). However, since beacons for some USA military special program have been

registered in the RGDB (instead of, or in addition to, being registered in JSETS), RGDB information for specific beacon IDs and a reference to JSETS is provided for some special programs.

By default, alert messages are distributed by LGM capable MCCs to other MCCs based on the MCC Reference Position once the position is confirmed; however, MCCs may opt out of receiving alerts after position confirmation from LGM capable MCCs. Alert messages are distributed by L/G only capable

MCCs to other MCCs only until position is confirmed. As a consequence, alerts for USA special program beacons will only be distributed to the USMCC after position confirmation when:

a) the alert is detected by a USA LEOLUT, GEOLUT, or MEOLUT (where only LEOLUTs have stored/global capability).
b) the alert is detected by a foreign LEOLUT, GEOLUT, or MEOLUT that is associated with an LGM capable MCC.

If the Program Block Registration ID is set to a value other than 000000000000001, then this ID identifies a single registration in the RGDB associated with the entire special program, not the specific beacon ID. The associated registration data usually provides a link to a separate registration database, as described in Section 3.4.

Some information encoded in the beacon ID is specific to certain USA national use protocols and is documented separately.

3.3.5.1 Beacon Decode Information for USA Naval Submarine Program Beacons

The following applies only to the USA Naval Submarine special program. The SEPIRB ID is the serial number for the beacon. (SEPIRB is an acronym for Submarine EPIRB.) MINUTES FOR GPS LOC provides the number of minutes elapsed between beacon activation and the acquisition of encoded location from a GPS satellite; the value is "N/A" if data is not available. HOURS ACTIVE contains the number of hours since beacon activation; the value is "N/A" if data is not available. See the sample message in Annex 8.

3.3.5.2 Beacon Decode Information for USA CSEL Program Beacons

The following applies only to the USA CSEL special program. The HHR ID is the serial number for this beacon; HHR is an acronym for Hand Held Radio. ZEROIZE STATUS (value is "YES," "NO," or "N/A") indicates whether associated devices have been cleared. TEST MODE (value is "YES," "NO," or "N/A") indicates whether the beacon was activated in test mode or normal operating mode. "N/A" indicates that data is not available for ZEROIZE STATUS and TEST MODE. *The USMCC processes alerts for this special program as operational alerts regardless of the value given in TEST MODE.*

3.3.6 Beacon Decode Information – FGB ELT(DT) Encoded Position Altitude and Currency

The encoded (i.e., GNSS) position altitude for an FGB ELT(DT) will be provided with the title "ALTITUDE OF GNSS LOCATION:" and one of the following values:

a) "LESS THAN 400 METRES (1300 FEET)"
b) "BETWEEN [XXXX1] AND [YYYY1] METERS (BETWEEN [XXXX2] AND [YYYY2] FEET)", where [XXXX1] and [YYYY1] are the values provided in document C/S T.001 and [XXXX2] and [YYYY2] are the corresponding values rounded to the nearest hundreds of feet
c) "GREATER THAN 10000 METERS (32800 FEET)"
d) "NOT AVAILABLE

A sample is provided below:

```
ALTITUDE OF GNSS LOCATION:
 BETWEEN 1600 AND 2200 METRES (BETWEEN 5200 AND 7200 FEET)
```

If encoded position currency information is available for an FGB ELT(DT), then the following text will be provided:

"UPDATE TIME WITHIN [AAAA] OF DETECTION TIME" where "[AAAA]" is one of the following:

- "0 - 2 SECONDS"
- "2 - 60 SECONDS"
- "1 MINUTE TO 4 HOURS"

3.3.7 Beacon Decode Information – Other SGB Data

If an SGB lacks encoded (i.e., GNSS) position capability, a data line will indicate:
"BEACON DOES NOT HAVE GNSS POSITION CAPABILITY".

If available, the time of GNSS position update is provided for SGB ELT(DT)s in the format:

"TIME OF GNSS POSITION UPDATE: DY HHMMSS MON"

where "DY" is the day of month, "HHMMSS" is hours, minutes, and seconds and "MON" is the month.

If available, the time that has expired since the GNSS location was generated is provided, as:

- "TIME SINCE GNSS LOCATION GENERATED: nnnn MINUTES" (if the value is < 2046 minutes), or
- "TIME SINCE GNSS LOCATION GENERATED: 2046 MINUTES OR MORE" (if the value is greater than or equal to 2046 minutes)

If available, the altitude of the GNSS location is provided, in the format:
"ALTITUDE OF GNSS LOCATION: nnnnn METRES (yyyyyyy FEET)"
where the value is feet is rounded to the nearest foot.

If available, the hours elapsed since beacon activation is provided, as:

- "ELAPSED TIME SINCE ACTIVATION: nn HOURS" (if the value < 63), or
- "ELAPSED TIME SINCE ACTIVATION: 63 HOURS OR MORE" (if the value = 63 or more).

As available, the remaining battery capacity is provided as a percentage, in the format:
"REMAINING BATTERY CAPACITY: BETWEEN nn AND nnn PERCENT".

If information on the operational characteristics is available is available for an SGB TAC number in the local TAC database maintained at the USMCC, then this text will be provided in the alert message:

BEACON CHARACTERISTICS PER TAC DATABASE PROVIDED IN A SEPARATE MESSAGE

Information about SGB operational characteristics is provided in a SIT 956 message, as described in Section 5.5.

3.3.8 Beacon Decode Information for Unreliable Beacon Messages

When the 406 MHz beacon message contains unreliable information (and if the associated 15- or 23-hex ID does not match the hex ID of a previous reliable beacon message), then no associated data fields are decoded, and the Beacon Decode Information contains the following line:

```
NO DATA PROVIDED BECAUSE THE BEACON CODING IS NOT RELIABLE
```

Because the beacon coding is not reliable, it is not advisable to decode the beacon ID independently of the USMCC provided message (for instance, from the C/S web site). Alert messages with unreliable 406 MHz beacon messages are distributed based only on:

a) DOA or Doppler location (if available), or
b) data in the USA Registration database (if registered, and DOA or Doppler location not available).

Section 2.1.4 provides further information on unreliable 406 MHz beacon messages.

3.3.9 Beacon Decode Information for IHDB Records Found Statement

When a site closes in the USMCC, a record is created in the IHDB. A statement appears at the end of the Beacon Decode section indicating whether or not previous activations have been recorded in the IHDB. The results of the IHDB search, as shown below, are provided in the statement.

```
6 IHDB record(s) found, most recent: 2020-12-25.
```

```
No IHDB records found.
```

3.4 Beacon Registration Data

This block provides data stored in the USMCC Beacon Registration Database (RGDB) for the beacon ID, and contains three sections of RGDB data: 1) owner contacts, 2) carriage and type of use, and 3) registration date and special information. This block is provided until position is confirmed, but is not provided on messages subsequent to position confirmation.

Table 3.2.11 lists the country/region codes for which beacon registration is maintained in the USA Beacon Registration Database.

Empty beacon registration fields, including telephone numbers, AIS number, and INMARSAT number, may be excluded from the RCC message to limit the message size. This reduces the chance that the RCC message will exceed the AFTN message length limitss.

3.4.1 Beacon Registration Data – Owner Contacts

The first section ("OWNER CONTACTS") provides the beacon owner and emergency points of contact information, including owner name, owner home address, and names and telephone numbers for emergency points of contact. This section is the same for all beacon types.

If the OWNER NAME indicates "SEE JSETS," then further beacon registration information about the specific (activated) beacon is provided in the JSETS database. "SEE JSETS" in the OWNER NAME indicates that the beacon belongs to a group of national protocol beacons allocated by NOAA to a USA military special program or to another USA government special program that registers its beacons in JSETS.

3.4.2 Beacon Registration Data – Carriage and Type of Use

The second section provides information about beacon carriage and type of use. Its format varies based on beacon type. For any beacon type other than ELT or PLB, information is provided per Section 3.4.2.1. The field titles identified in Sections 3.4.2.1 through 3.4.2.3 are in upper case and are listed per section in the order that they appear in the RCC message. Annex 5 contains sample beacon registration data for EPIRBs, ELTs, and PLBs.

If the PROGRAM BLOCK REGISTRATION ID is provided in the Beacon Decode Information (per Section 3.3), then beacon carriage and type of use information is based on the beacon type of the PROGRAM BLOCK REGISTRATION ID.

3.4.2.1 Beacon Registration Data – Carriage and Type of Use (EPIRBs and SSAS)

For EPIRBs and SSAS beacons, information is provided about the vessel that carries the beacon, including VESSEL NAME, TYPE, LENGTH OVERALL (FT), COLOR, CAPACITY (i.e., maximum number of people on the vessel), RADIO CALL SIGN, REGISTRATION NO, RADIO EQP (i.e., radio

equipment), INMARSAT NUMBER, CELLULAR NUMBER, IRIDIUM NUMBER, MMSI NUMBER, AIS NUMBER, NUMBER OF LIFE BOATS and NUMBER OF LIFE RAFTS. The HOME PORT PRIMARY SRR, the SECONDARY SRR associated with the home port, and the HOMEPORT (i.e., name, city, and state) are provided.

The AIS NUMBER (i.e., the Automatic Identifier System number) is a 9-digit number with the format xxxYYzzz, where xxx is "970" (standard AIS SART), "972" (maritime survivor locating device or Man overboard device), or "974" (AIS EPIRB), YY identifies the device manufacturer and yyy is a sequential number assigned by the manufacturer. For more information, see https://navcen.uscg.gov/types-of-ais.

The beacon MANUFACTURER, MODEL NUMBER, and ACTIVATION TYPE are included. ACTIVATION TYPE is "CAT1 (MANUAL AND AUTOMATIC)" for Category 1 beacons, "CAT2 (MANUAL)" for Category 2 beacons, and blank if the value is neither Category 1 or Category 2.

BEACON CONTAINS SVDR indicates if the beacon contains a Simple Voyage Data Recorder. Its values are NO and "YES. RECOVER IF POSSIBLE".

3.4.2.2 Beacon Registration Data – Carriage and Type of Use (ELTs)

For ELTs, including ELT(DT)s, information is provided about the aircraft that carries the beacon, including LEASING AGENT, AIRCRAFT MANUFACTURER, MODEL, AIRCRAFT USE, COLOR, RADIO EQP (i.e., radio equipment), CAPACITY (i.e., maximum number of people on the vessel), TAIL NUMBER, FIXED SURVIVAL CRAFT DESCRIPTION, and DEPLOYABLE SURVIVAL CRAFT DESCRIPTION. The AIRPORT PRIMARY SRR, and SECONDARY SRR associated with the aircraft, and the AIRPORT (i.e., name or code, city, and state) are provided.

The beacon MANUFACTURER and MODEL NUMBER are also included.

3.4.2.3 Beacon Registration Data – Carriage and Type of Use (PLBs)

For PLBs, the RADIO CALL SIGN, REGISTRATION NO, RADIO EQP (i.e., radio equipment), MMSI NUMBER, VESSEL NAME, AIS NUMBER, VEHICLE TYPE, SPECIFIC USAGE, HOME PORT, AIRPORT, and TAIL NUMBER are provided. The beacon MANUFACTURER and MODEL NUMBER are also included. The AIS NUMBER is described in Section 3.4.2.1.

3.4.3 Beacon Registration Data – Registration Dates and Special Information

The third and final section provides registration dates, remarks, and special status information, and contains the same fields regardless of beacon type. DATE FIRST REGISTERED is the date that the beacon was first registered. If a previously registered beacon is sold and registered by a new owner, then this field contains the date of registration by the new owner. DATE LAST UPDATED is the date that the registration for the beacon was last updated. DATE REG EXPIRES is the date by which registration is required to be renewed.

When an owner first registers a beacon, the USMCC issues a proof of beacon registration letter where the expiration date is two years from the date of issue. The USMCC issues courtesy decals for all types of beacons (including ELTs since 2018). Subsequently, the USMCC reissues proof of registration for the beacon when the owner name changes, the vessel/aircraft name changes, or the beacon owner confirms that the registration information is valid, and the new expiration date is set to two years after the date of reissue.

The REMARKS section contains notes based on feedback from the owner, a USA RCC or another responding agency. If the field content ends with "See RGDB," then the RCC should access the RGDB directly to view additional information that does not fit into the field as stored in the USMCC.

SPECIAL STATUS indicates whether the beacon is in a special status, as noted in Table 3.4.1. When a beacon is in a special status, it generally means that the beacon is unavailable for normal use or is not in the owner's possession. SPECIAL STATUS INFO provides additional information about the special status condition. REMARKS and SPECIAL STATUS information are provided for a significant portion of USA registered beacons and provide important information that may affect the SAR response.

Table 3.4.1: Beacon Registration Special Status Types

Special Status	Remarks
DESTROYED	The beacon owner reported that the beacon was destroyed
DUPLICATEID	NOAA determined that there are multiple beacons coded with this ID. This means that the associated beacon registration information may not apply when the beacon ID is activated.
LOST	The beacon owner reported that the beacon has been lost
OUTOFSERVICE	The beacon owner reported that the beacon is no longer in service (outage may be temporary or permanent)
RECODED	The beacon owner reported that the beacon has been recoded to another beacon ID (original beacon ID no longer in use by the owner)
REPLACED	The beacon owner reported that the beacon has been replaced by another beacon (owner is no longer using the original beacon)
SOLD	The beacon owner reported that the owner has sold the beacon
STOLEN	The beacon owner reported that the beacon was stolen

3.4.4 Beacon Registration Data for Special Programs

As described in Section 3.3.2, a group of 406 MHz beacons with a USA country code may be allocated to a special program based on official agreements between NOAA and USA Government agencies. For certain special programs, USMCC registration information is provided for specific beacon IDs, as described here and in Sections 3.3.3 and 3.4.1.

When the PROGRAM BLOCK REGISTRATION ID is set to 000000000000001 (as described in Section 3.3.2), USMCC registration data is provided on the alert message for the specific beacon ID and the beacon is part of a special program associated with JSETS.

When the PROGRAM BLOCK REGISTRATION ID is set to a value other than 000000000000001, then the beacon is part of a special program (that may or may not be associated with JSETS) and USMCC registration data is not provided on the alert message for the specific beacon ID. Specific individual beacon registration information may be maintained by the program owner. If beacons for the special program are registered in JSETS, then the OWNER field indicates "SEE JSETS" and no registration information about the specific beacon ID is provided in the alert message.

3.4.5 Beacon Registration Data Not Available

If the beacon is USA coded or the 406 MHz beacon message is unreliable, and the beacon is not registered in the RGDB, then the following comment is provided:

```
REGISTRATION INFORMATION IS NOT AVAILABLE IN THE USMCC DATABASE
```

3.4.6 Beacon Registration Data for Alerts with an Unreliable Beacon Message

When the 406 MHz beacon message contains invalid or inconsistent information, then the beacon coding is not reliable, as described in Section 3.3.3. Registration data is provided for beacons with unreliable coding, if registration data is available in the RGDB for the 15-digit beacon ID. However, RCCs should be cautious in using registration data when the beacon coding is unreliable, since the registration data may pertain to another beacon, not the beacon for which DOA or Doppler location is provided in the associated alert message.

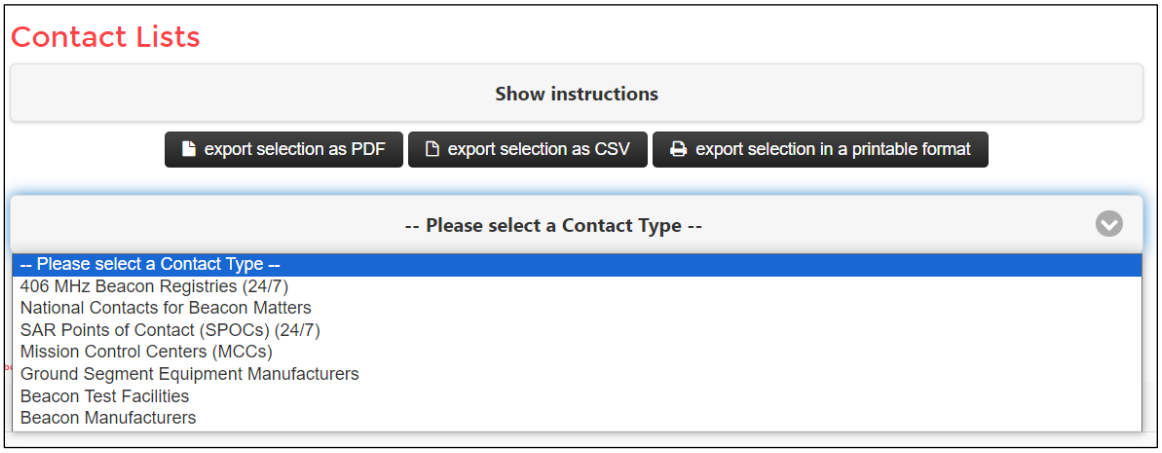
3.4.7 Beacon Registry Information for Non-USA-Coded Beacons

For non-USA-coded beacons, this block (see Table 3.4.2) contains the address for the C/S web page that provides contact lists related to beacon matters, including beacon registration. Countries that do not maintain a national registry typically include their beacons in the C/S International Registration Database (IBRD), which is maintained by the C/S Secretariat.

Table 3.4.2: Beacon Registry Information for Non-USA-Coded Beacons

```
REGISTRATION AT SEE COSPAS-SARSAT WEBSITE
WEB: COSPAS-SARSAT.INT/EN/CONTACTS-PRO/CONTACTS-DETAILS-ALL
```

From that web page, the RCC/SPOC can find the most up-to-date contact information by selecting “406 MHz Beacon Registries (24/7)” from the pull-down list:



3.5 Supporting Information

This block provides supporting information about the alert message and beacon activation (see sample in Table 3.5.1).

Table 3.5.1: Sample Supporting Information

```
**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 15 0104 FEB

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC,CGD08,CGD07

ALERT MESSAGES FOR THIS BEACON PREVIOUSLY SENT TO: N/A

PREVIOUS MESSAGE INFORMATION: N/A
```

3.5.1 USMCC Processing Time

The USMCC PROCESSING TIME format is DD HHMM MON, where DD is the day of month, HHMM is hour and minute of the day in Zulu time (UTC), and MON is the month of the year. This is the time that this alert message was processed at the USMCC initially, and is usually very close to the message transmission time provided in line 1 of the message header. If the transmission time is more than 1 minute later than the USMCC PROCESSING TIME, then the message was probably transmitted manually by USMCC personnel after the output message was generated at the USMCC.

3.5.2 Alert Message Destinations – Current and Previous

Field THIS ALERT MESSAGE IS BEING SENT TO lists the destinations (US RCCs, USA SPOCs, or foreign MCCs) for this message from the USMCC. If the USMCC sends the alert to a non-nodal MCC in another Data Distribution Region (DDR), the immediate MCC destination (e.g., FMCC) is not listed, only the final MCC destination (e.g., UKMCC) is listed. If the originating LUT (SOURCE) is foreign, then the destination list will exclude those SRRs which would receive the alert from another MCC. For example, if the Canadian MCC (CMCC) sends a first alert to the USMCC with the "A" location in the AFRCC SRR and the "B" location in the CMCC SRR, then ALERT MESSAGE IS BEING SENT TO will only list AFRCC, since the CMCC will send the alert to its own RCC. (If the USMCC sends an alert to the CMCC based on a location in the Canadian SRR, the destination list will include the name of the Canadian RCC and the CMCC.) Thus, ALERT MESSAGE IS BEING SENT TO and the SRR should both be examined to determine which SAR agencies are working on a SAR case.
A discrepancy between the SRR and the list of current message destinations may also occur because the message type (e.g., SIT 172, 176, 177, or 376) is specific to USA alert data distribution procedures and is not defined in C/S procedures used to distribute alert data to foreign MCCs and some SPOCs. For example, a SIT 172 message (Located First Alert Update) sent to CGD09 due to an improved Doppler location probability with a location in the FMCC SRR would not list the FMCC as a current message destination, because this type of alert is not defined in C/S documentation for exchange by MCCs.

In addition, destinations that receive an alert message based on the USMCC "echo" capability are not identified in the Supporting Information section.

When position is confirmed for an RLS beacon, the new alert is sent to the MCC associated with the RLS provider, as described in Section 3.2.3.8.2. For example, the new alert used to confirm position for an RLS beacon coded to use the Galileo constellation would be sent to the FMCC (and FMCC would be included in the message distribution list), even if an alert was not sent to the FMCC based on beacon location or beacon country code.

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO lists all destinations that previously received alert messages from the USMCC for this beacon activation, using the same logic as the list of current message destinations. This information can be used to contact other SAR agencies that may already be working on the SAR case. On a first alert, a value of "N/A" indicates that no data is available.

3.5.3 Previous Message Information

PREVIOUS MESSAGE INFORMATION lists solution data for messages previously sent by the USMCC for the site, in descending order by time the messages were received by the USMCC. If more than 5 messages were sent for the site, solutions are only provided for the last 5 messages. Up to 3 solutions may be provided per previous message, if the message contains Doppler and encoded position. Two solutions may be provided per previous message, if the message contains DOA and encoded position.

Solution data fields are provided in the same format as described above in the Alert Data Block. SRR and BUFFER information is only provided in this section before position confirmation. The other solution data fields are always provided.

On the first alert for a beacon activation (i.e., alert site), a value of "N/A" indicates that no data is available. However, the first alert received by an RCC for an alert site may contain previous message information if a previous alert was sent to another destination instead (e.g., due to the country code in the Beacon ID, or the DOA, Doppler, or encoded location).

Once position is confirmed, if one of two associated Doppler position matches the MCC Reference Position within 20 km, then the non-matching (i.e., incorrect) Doppler position is not reported in the previous message information.

When position data from two different alert messages is used to confirm position (i.e., position data from the current alert and a previously received alert), it is possible that data from the previously received alert would not be sent by the USMCC. This would occur when the previously received alert used to confirm position was redundant at the time it was received (and thus was not sent by the USMCC), but contained data that was subsequently used to confirm position. When this occurs, the initial alert used to confirm position will not be provided in the PREVIOUS MESSAGE INFORMATION, since this initial alert was not sent by the USMCC (see Table 3.5.2).

Table 3.5.2: Sample Previous Message Information (Position Confirmed)

```
PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
85   N/A A  64 11.4N  151 22.3W  17 102312 FEB S10 009 AK1
N/A  016 D  64 11.9N  151 21.9W  17 102513 FEB MEO 004 CMCC
N/A  005 D  64 11.6N  151 21.8W  17 102023 FEB MEO 005 FL_MEO
N/A  N/A U  N/A                  17 101955 FEB G16 001 MD1
```

3.6 Incident Feedback Request

Feedback on 406 MHz alert sites is used to identify opportunities to improve beacon design, beacon usage, regulation, information processing and alert response. This feedback also allows the USMCC to provide information on distress alerts (i.e., SARSAT rescues) to the Cospas-Sarsat Secretariat to meet requirements of document C/S A.003 and to NOAA and other USA agencies to meet national requirements. The incident feedback request enables USA RCCs and SPOCs to provide feedback about a beacon activation. Annex 1 describes fields in the incident feedback request and Annex 6 contains a sample incident feedback request. If present, the incident feedback request starts on a new page in the alert message.

As of March 2009, this block is not included in alert messages to any RCC, because the RCCs provide incident feedback information directly to the IHDB (https://incidenthistory.noaa.gov/ihdb/). The incident

feedback request is included in alert messages to SPOCs, since SPOCs do not have direct access to the IHDB. A sample message that contains an incident feedback request is provided in Section 4.7.6.

When a 406 MHz alert site closes, a site closure (SIT 176 or 376) message is sent to the appropriate USA RCC(s) and SPOCs, and information on the closed site is added to the IHDB. RCC personnel can provide feedback directly in the IHDB once the closed site is added to the IHDB. Since closed site information is only added to the IHDB every 10 minutes, RCC personnel may need to wait briefly to provide feedback. When accessing the IHDB, refer to the detect time to ensure that the appropriate IHDB case is being referenced for a specific SITE ID or BEACON ID. SPOC personnel can provide incident feedback to the USMCC upon receipt of the site closure message, and USMCC personnel then update the IHDB on behalf of the SPOC (see Annex 6).

Normally site closure messages are only sent to USA RCCs and SPOCs. In addition, when the USMCC backs up another MCC (e.g., JAMCC or CHMCC), it will send site closure messages to a backup destination that receives alert messages in SPOC format. While the header of the Incident Feedback Request in the site closure message requests feedback, the USMCC does not expect to receive incident feedback from other MCCs (e.g., JAMCC) or SPOCs associated with other MCCs (e.g., the Uruguay SPOC associated with the CHMCC), since the USMCC is only responsible for reporting on SAR incidents in the USA service area.

Note that the incident feedback form is designed to fit within the 69-character line limit for MCCs, since the USMCC may send a site closure message to an MCC during an MCC backup.

3.7 Message Trailer

The message trailer consists of three lines of fixed text, as shown in Table 3.7. All alert and support messages begin with a message header and ends with a message trailer. The first line of the message trailer contains “QQQQ” (as defined nationally, for USA RCCs) or “END OF MESSAGE” (as specified in document C/S A.002 for SPOCs). The last two lines of the message trailer are specified in document C/S A.002 and are included in all messages sent by MCCs to other MCCs.

Table 3.7: Message Trailer

```
QQQQ
/LASSIT
/ENDMSG
```

4 RCC ALERT MESSAGE SAMPLES AND FURTHER DESCRIPTIONS

In the following examples, actual registration data has been altered (or removed) to protect personally identifiable information. Table 2.1 provides an overview on types of alert messages.

4.1 Unlocated First Alerts

4.1.1 Unlocated First Alert for PLB (SIT 170)

Notes on example: The beacon type (BEACON TYPE) is Serial PLB with Standard Location Protocol. The unlocated alert for this PLB was sent to CGD07 (SRR) based on the OWNER home address in the Beacon Registration.

```
/24211 00000/3660/15 359 1843
/170/366M

**** 406 BEACON UNLOCATED FIRST ALERT ****

BEACON ID: 2DCE6 82200 FFBFF      SITE ID: 54792

**** DETECTION TIME AND POSITIONS FOR THE BEACON ***

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A                  24 184233 DEC G16 002 MD1    CGD07

DETECTION FREQUENCY: 406.0368 MHZ

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: PLB SERIAL (STANDARD)
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: TAC 208          MODEL      :
SERIAL NUM  : 256              HOMING     : 121.5
POSITION DEVICE: INTERNAL      POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

OWNER: John Doe
  999 First Street               TEL 1: CELL 954123 4567
  Fort Lauderdale         FL     TEL 2: WORK 954222 3333
  33315     USA                  TEL 3:
                                 TEL 4:
  EMAIL: JohnDoe@gmail.com

CONTACTS: Jack Smith
  TEL 1: CELL 9541112222           TEL 1:
  TEL 2: HOME 9540124567           TEL 2:
  TEL 3:                           TEL 3:
  TEL 4:                           TEL 4:
```

```
RADIO CALL SIGN:                        REGISTRATION NO:
RADIO EQP:
MMSI NUMBER:                            AIS NUMBER:

VESSEL NAME: Bounty
VEHICLE TYPE: Boat
SPECIFIC USAGE: Other
HOME PORT: US Harbor                     Baltimore                    MD
AIRPORT: BWI                            Baltimore                    MD
TAIL NO: N12345

MANUFACTURER: ACR                       MODEL NUMBER: PLB-350B

DATE FIRST REGISTERED: 27 APR 2011    DATE REG EXPIRES: 27 APR 2013
DATE LAST UPDATED: 27 APR 2011

REMARKS:

SPECIAL STATUS:                        SPECIAL STATUS DATE:
SPECIAL STATUS INFO:


**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 24 1843 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  CGD07

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO: N/A

PREVIOUS MESSAGE INFORMATION: N/A

QQQQ
/LASSIT
/ENDMSG
```

4.1.2 Unlocated First Alert for ELT (SIT 170)

Notes on example: The beacon type (BEACON TYPE) is 24 Bit Address ELT with Standard Location Protocol (FGB). The unlocated alert for this ELT was sent to AFRCC (SRR) based on the AIRPORT address in the Beacon Registration. In the Beacon Decode section, the 24-bit address (24 BIT ADDR) is provided in hexadecimal format (HEX=) and the corresponding tail number for the USA aircraft (N203JP) is provided in CRAFT ID. SOL = 'U', meaning that this is an unlocated alert.

```
89666 00000/3660/22 049 1239
/170/366S

****  406 BEACON UNLOCATED FIRST ALERT ****

BEACON ID: 2DC74 33BFC FFBFF      SITE ID: 75100

*****************  DETECTION TIME AND POSITIONS FOR THE BEACON  **************

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A                  18 123721 FEB MEO 002 SPMCC  AFRCC

DETECTION FREQUENCY: 406.0370 MHZ
FIRST DETECT TIME: 18 123720 FEB

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA             BEACON TYPE: ELT 24 BIT ADDRESS (STD)
COUNTRY CODE: 366             CRAFT ID   : N203JP         SPECIFIC BEACON:
MANUFACTURER:                 MODEL      :
24 BIT ADDR : HEX=A19DFE      HOMING     : 121.5
POSITION DEVICE: EXTERNAL     POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

OWNER: Smith LLC
  P.O. Box 1111                  TEL 1: WORK 123456789
  Smithtown               LA     TEL 2:
  70601     USA                  TEL 3:
                                 TEL 4:
  EMAIL: JohnSmith@erahelicopters.com

CONTACTS: Operation Supervisor
  TEL 1: HOME 123456788           TEL 1:
  TEL 2:                          TEL 2:
  TEL 3:                          TEL 3:
  TEL 4:                          TEL 4:

LEASING AGENT:

AIRCRAFT MANUFACTURER/MODEL: AugustaWestland       / AW119MKII
AIRCRAFT USE: Helicopter             COLOR: red/white/black
RADIO EQP: VHF                       CAPACITY:     8
TAIL NO: N12345
```

```
FIXED SURVIVAL CRAFT DESCRIPTION:

DEPLOYABLE SURVIVAL CRAFT DESCRIPTION:
  pop-out floats

AIRPORT PRIMARY SRR: AFRCC            SECONDARY SRR:
AIRPORT: LAKE CHARLES REGIONAL        LAKE CHARLES          LA
ALTERNATE AIRPORT:

MANUFACTURER: ARTEX                   MODEL NUMBER: C406N-HM

DATE FIRST REGISTERED: 27 MAY 2018    DATE REG EXPIRES: 12 MAY 2022
DATE LAST UPDATED: 12 MAY 2020

REMARKS: PRIMARY USAGE IS IN GULF OF MEXICO




SPECIAL STATUS:                       SPECIAL STATUS DATE:
SPECIAL STATUS INFO:


**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 18 1239 FEB

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO: N/A

PREVIOUS MESSAGE INFORMATION: N/A

QQQQ
/LASSIT
/ENDMSG
```

4.1.3 Unlocated First Alert for EPIRB (SIT 170)

Notes on example: This unlocated alert is identified as an "UNCORROBORATED MEOSAR ALERT" as described in Section 3.2.7. NUM is always 001 for an uncorroborated MEOSAR alert. The destination is CGD07, which corresponds to the destination code in line (366M), the HOME PORT PRIMARY SRR in the Beacon Registration Database Information and THIS ALERT MESSAGE IS BEING SENT TO in the Supporting Information.

```
/07852 00000/3680/15 191 1658
/170/366M

****  406 BEACON UNLOCATED FIRST ALERT ****

BEACON ID: ADCD0 2170D 44001      SITE ID: 98853

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A                  10 165627 JUL MEO 001 MD-MEO

DETECTION FREQUENCY: 406.0252 MHZ
FIRST DETECT TIME: 10 165627 JUL
UNCORROBORATED MEOSAR ALERT

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: EPIRB SERIAL CATEGORY I
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: ACR              MODEL      : UNKNOWN
SERIAL NUM  : 34243            HOMING     : 121.5
POSITION DEVICE: NIL           POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

OWNER: BOB JONES
  111 MAIN AVENUE               TEL 1: OTHR 3051234567
  HOMESTEAD               FL    TEL 2:
  33035     USA                 TEL 3:
                                TEL 4:
  EMAIL:

CONTACTS: FISH INC
  TEL 1: WORK 3052223333          TEL 1: OTHR 7862371310
  TEL 2:                          TEL 2:
  TEL 3:                          TEL 3:
  TEL 4:                          TEL 4:

VESSEL NAME: LITTLE FISH
TYPE: POWER Fishing                LENGTH OVERALL (FT):    42
COLOR: WHITE                       CAPACITY:     4
RADIO CALL SIGN:                   REGISTRATION NO:
RADIO EQP: VHF                     INMARSAT NUMBER:
CELLULAR NUMBER:                   IRIDIUM NUMBER: 8811234567890
```

```
MMSI NUMBER:                          AIS NUMBER:

NUMBER OF LIFE BOATS:     0           NUMBER OF LIFE RAFTS:     0

HOME PORT PRIMARY SRR: CGD07          SECONDARY SRR:
HOME PORT: NO DATA PROVIDED            STOCK ISLAND                FL

MANUFACTURER: ACR                     MODEL NUMBER: RLB-32
ACTIVATION TYPE: CAT1 (MANUAL AND AUTOMATIC)

BEACON CONTAINS SVDR: NO

DATE FIRST REGISTERED: 28 OCT 2008    DATE REG EXPIRES: 29 APR 2017
DATE LAST UPDATED: 29 APR 2015

REMARKS:

SPECIAL STATUS:    OUTOFSERVICE      SPECIAL STATUS DATE: 29 APR 2015
SPECIAL STATUS INFO:
   BOAT BEING REBUILT



**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 10 1658 JUL

THIS ALERT MESSAGE IS BEING SENT TO:
  CGD07

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO: N/A

PREVIOUS MESSAGE INFORMATION: N/A

QQQQ
/LASSIT
/ENDMSG
```

4.2 Located First Alerts

4.2.1 Initial Located Alert, Doppler Location (SIT 171)

This alert is sent to MARSEC due to the Doppler "B" location, which has a 39% probability (PROB). The EMAIL address contains "(AT)," which stands for "@".

```
/74542 00000/3660/15 049 1315
/171/366G

**** 406 BEACON INITIAL LOCATED ALERT ****

BEACON ID: 46683 82668 FFBFF      SITE ID: 75102

*****************  DETECTION TIME AND POSITIONS FOR THE BEACON  **************

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
61   N/A A  01 22.2N  103 59.9E  18 130234 FEB S13 008 VNMCC  SIMCC
39   N/A B  08 29.5N  135 58.9E  18 130234 FEB S13 008 VNMCC  MARSEC

DETECTION FREQUENCY: 406.0343 MHZ

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : SINGAPORE        BEACON TYPE: ELT SERIAL (STANDARD)
COUNTRY CODE: 563              CRAFT ID   :               SPECIFIC BEACON:
MANUFACTURER: TAC 112          MODEL      :
SERIAL NUM  : 4916             HOMING     : 121.5
POSITION DEVICE: EXTERNAL      POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION AT MCC SINGAPORE
AFTN: WSSSZSZX
PHONE: (65) 65425024
FAX: (65) 65422548
EMAIL: CAAS_RCC(AT)CAAS.GOV.SG
WEB: WWW.406REGISTRATION.COM

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 18 1315 FEB

THIS ALERT MESSAGE IS BEING SENT TO:
  MARSEC,SIMCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  SIMCC
```

```
PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A                 18 125944 FEB S11 001 GU1    SIMCC

QQQQ
/LASSIT
/ENDMSG
```

4.2.2 Initial Located Alert, Encoded Location (SIT 171)

This MEOSAR alert with encoded location has a DETECT TIME (last detect time) “24 184321 DEC” with two detections (i.e., NUM = 002), one minute after a GEOSAR (satellite G16) unlocated alert was detected (per the PREVIOUS MESSAGE INFORMATION). The FIRST DETECT TIME for the alert matches the last detect time (i.e., field DETECT TIME). CGD05 was added to the distribution list for the alert site based on the encoded location. There is no MCC Reference Position because the position has not been confirmed. Per the BEACON TYPE, the protocol is STANDARD location, and the encoded position RESOLUTION is 15 MINUTES (coarse), indicating that encoded position data in PDF-2 of the beacon message is not usable.

```
/24212 00000/3660/15 359 1844
/171/366M

**** 406 BEACON INITIAL LOCATED ALERT ****

BEACON ID: 2DCE6 82200 FFBFF      SITE ID: 54792

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A E  36 30.00N 072 30.00W 24 184321 DEC MEO 002 SPMCC4 CGD05

DETECTION FREQUENCY: 406.0368 MHZ
FIRST DETECT TIME: 14 184321 DEC

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: PLB SERIAL (STANDARD)
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: TAC 208          MODEL      :
SERIAL NUM  : 256              HOMING     : 121.5
POSITION DEVICE: INTERNAL      POSITION RESOLUTION: 15 MINUTES

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

OWNER: John Doe
  999 First Street               TEL 1: CELL 954123 4567
  Fort Lauderdale         FL     TEL 2: WORK 954222 3333
  33315     USA                  TEL 3:
                                 TEL 4:
  EMAIL: JohnDoe@gmail.com

CONTACTS: Jack Smith
  TEL 1: CELL 9541112222           TEL 1:
  TEL 2: HOME 9540124567           TEL 2:
  TEL 3:                           TEL 3:
  TEL 4:                           TEL 4:

RADIO CALL SIGN:                      REGISTRATION NO:
RADIO EQP:
MMSI NUMBER:                          AIS NUMBER:
```

```
VESSEL NAME: Bounty
VEHICLE TYPE: Boat
SPECIFIC USAGE: Other
HOME PORT: US Harbor                  Baltimore                  MD
AIRPORT: BWI                          Baltimore                  MD
TAIL NO: N12345

MANUFACTURER: ACR                    MODEL NUMBER: PLB-350B

DATE FIRST REGISTERED: 27 APR 2011    DATE REG EXPIRES: 27 APR 2013
DATE LAST UPDATED: 27 APR 2011

REMARKS:

SPECIAL STATUS:                      SPECIAL STATUS DATE:
SPECIAL STATUS INFO:

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 24 1844 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  CGD07, CGD05

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  CGD07

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A                  24 184230 DEC G16 001 MD1    CGD07

QQQQ
/LASSIT
/ENDMSG
```

4.2.3 Initial Located Alert, Unreliable Beacon Message (SIT 171)

Notes on example: Because the FGB message (including the 15-hexadecimal beacon ID) is unreliable, this alert message was distributed solely based on the Doppler location. The "A" side position has a 61% probability and is located in the CGD01 SRR. The "B" side position has a 39% probability and is located in the United Kingdom (UKMCC) SRR. The message SOURCE is the Spain MCC (SPMCC). Following C/S data distribution rules, the SPMCC distributed this alert to the France MCC (FMCC) which distributed it to the UKMCC. Field THIS ALERT MESSAGE IS BEING SENT TO only shows CGD01, not UKMCC, because the USMCC did not distribute the alert to the UKMCC.

```
/64125 00000/3660/15 358 1810
/171/366B

!!! UNRELIABLE BEACON (HEXADECIMAL) ID !!!!!!!!!!

**** 406 BEACON INITIAL LOCATED ALERT ****

BEACON ID: D4EB2 A9A69 A68B6      SITE ID: 20000

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
61   N/A A  42 57.8N  058 18.8W  24 180723 DEC S7  010 SPMCC  CGD01
39   N/A B  53 21.9N  000 59.0W  24 180723 DEC S7  010 SPMCC  UKMCC

DETECTION FREQUENCY: 406.0311 MHZ
HIGH PROBABILITY THAT THE NEW DOPPLER POSITION DATA IS ACCURATE WITHIN 5 KM

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

NO DATA PROVIDED BECAUSE THE BEACON CODING IS NOT RELIABLE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION IS NOT AVAILABLE IN THE USMCC DATABASE

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 24 1809 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  CGD01

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO: N/A

PREVIOUS MESSAGE INFORMATION: N/A

QQQQ
/LASSIT
/ENDMSG
```

4.2.4 Initial Located Alert, with DOA Position (SIT 171)

Notes on example: this MEOSAR alert is being sent to CGD13 based on the DOA position after an unlocated alert was sent to the AFRCC for this USA coded ELT. The SIT number (171) implies that the position is not confirmed.

```
/04422 00000/3660/15 191 0202
/171/366E

**** 406 BEACON INITIAL LOCATED ALERT ****

BEACON ID: ADCC5 20B90 0020D      SITE ID: 98692

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  005 D  47 06.8N  122 27.9W  10 020154 JUL MEO 004 HI-MEO CGD13

DETECTION FREQUENCY: 406.0276 MHZ
FIRST DETECT TIME: 10 020153 JUL

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: ELT SERIAL AVIATION
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: TAC 131          MODEL      :
SERIAL NUM  : 295652           HOMING     : 121.5
POSITION DEVICE: NIL           POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION IS NOT AVAILABLE IN THE USMCC DATABASE

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 10 0202 JUL

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC,CGD13

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO: N/A

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A                 10 020153 JUL G16 001 MD1    AFRCC

QQQQ
/LASSIT
/ENDMSG
```

4.3 Updated Located Alerts Prior to Position Confirmation

4.3.1 Position Update (SIT 172)

This Position Update alert (prior to position confirmation) was sent because the “A” side probability (86%) is at least 15% higher than the “A” side probability on the previous alert sent for the same satellite pass. The higher probability gives the RCC better information about the true location, but location data from an independent beacon event is still required to confirm the beacon position. Note that if a same pass Doppler position conflict alert is sent with a significantly higher “A” side probability (e.g., 82% vs. 50%), then a Doppler location first alert update could later be sent (e.g., with “A” side probability 86% vs. 50%) if the first Doppler alert for the pass (with “A” side probability 50%) remains the reference alert, per C/S A.001 rules for processing same-pass Doppler position conflicts.

Field THIS ALERT MESSAGE IS BEING SENT TO only lists CGD01, not UKMCC, because this message was distributed based on USA national rules, not C/S data distribution procedures. The POSITION DEVICE is NIL because the beacon type (ELT AVIATION USER) is not location protocol.

```
/24303 00000/3660/15 359 1817
/172/366B

**** 406 BEACON POSITION UPDATE ****

BEACON ID: ADC64 99D71 CBBE1      SITE ID: 54789

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
86   N/A A  53 17.2N  000 53.6W  24 180714 DEC S7  011 CMCC   UKMCC
14   N/A B  42 21.4N  058 13.8W  24 180714 DEC S7  011 CMCC   CGD01

DETECTION FREQUENCY: 406.0276 MHZ
HIGH PROBABILITY THAT THE NEW DOPPLER POSITION DATA IS ACCURATE WITHIN 5 KM

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA             BEACON TYPE: ELT AVIATION USER
COUNTRY CODE: 366             CRAFT ID   :  N177CK        SPECIFIC BEACON: 0
MANUFACTURER:                 MODEL      :
SERIAL NUM  :                 HOMING     : 121.5
POSITION DEVICE: NIL          POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION IS NOT AVAILABLE IN THE USMCC DATABASE

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 24 1817 DEC
```

```
THIS ALERT MESSAGE IS BEING SENT TO:
  CGD01


ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  CGD01

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
50   N/A A  42 57.4N  058 18.8W  24 180714 DEC S7  003 SPMCC  CGD01
50   N/A B  53 21.2N  000 58.6W  24 180714 DEC S7  003 SPMCC  UKMCC

QQQQ
/LASSIT
/ENDMSG
```

4.3.2 Unresolved Doppler Position Match (SIT 172)

This alert was sent because each of the new Doppler positions match the Doppler positions from a separate satellite pass within 20 km, prior to position confirmation. While position is normally confirmed when a new location matches a previous location from an independent source within 20 km, when both new Doppler positions match previous Doppler positions from a separate satellite pass, the MCC cannot determine which matching location is the true location. Despite the absence of position confirmation, the "A" and "B" position probabilities of the matching Doppler locations can help determine which location is likely real; in this case, the "A" position probability is 95%.

```
/03324 00000/3660/11 242 1026
/172/366M

**** 406 BEACON UNRESOLVED DOPPLER POSITION MATCH ****

BEACON ID: ADCD0 22959 44801      SITE ID: 02957

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
95   N/A A  27 05.7N  082 23.1W  30 095932 AUG S10 012 FL2    CGD07
05   N/A B  24 26.0N  069 57.6W  30 095932 AUG S10 012 FL2    CGD07 /SANJN

DETECTION FREQUENCY: 406.0276 MHZ
HIGH PROBABILITY THAT THE NEW DOPPLER POSITION DATA IS ACCURATE WITHIN 5 KM

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: EPIRB SERIAL CATEGORY I
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: ACR              MODEL      : UNKNOWN
SERIAL NUM  : 35414            HOMING     : 121.5
POSITION DEVICE: NIL           POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION IS NOT AVAILABLE IN THE USMCC DATABASE

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 30 1023 AUG

THIS ALERT MESSAGE IS BEING SENT TO:
        CGD07,SANJN

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  CGD07,SANJN
```

```
PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A       N/A        30 090155 AUG G16 002 GSE    CGD07
90   N/A A  27 05.7N  082 23.2W  30 095844 AUG S11 007 FL1    CGD07
10   N/A B  24 26.1N  069 57.6W  30 095844 AUG S11 007 FL1    CGD07 /SANJN

QQQQ
/LASSIT
/ENDMSG
```

4.3.3 DOA Position Match Alert (SIT 372)

This alert was sent for an SGB ELT(DT), as evidenced by the special header that indicates “DISTRESS TRACKING ELT” and the BEACON TYPE that indicates “SGB ELT(DT)”. The 23-hex SGB identification is provided in the BEACON ID. The title indicates “406 BEACON DOA POSITION MATCH ALERT” because the DOA and encoded positions match in the alert match within 20 km for an ELT(DT). The beacon position is never confirmed for an ELT(DT), since ELT(DT)s are assumed to be fast-moving. The first two data fields in the first data line indicates that the current message number is 37646 and this message was previously sent as message number 37644.

The CRAFT ID TYPE is AIRCRAFT OPERATOR DESIGNATOR, and the three-letter aircraft operator designator (3LD) is provided in CRAFT ID. The airline can be identified from the 3LD, per ICAO document DOC 8585. ACTIVATION TYPE indicates that the beacon was activated manually. The TIME OF GNSS POSITION UPDATE matches the DETECT TIME associated with the DOA position. The ALTITUDE OF GNSS LOCATION is provided in meters and feet.

The text BEACON CHARACTERISTICS PER TAC DATABASE PROVIDED IN A SEPARATE MESSAGE indicates that information about SGB operational characteristics is provided to the message destination (CGD07) in a separate SIT 956 message

THIS ALERT MESSAGE IS BEING SENT TO indicates that this message is being sent to the FMCC (because the COUNTRY code is AUSTRIA, which is in the FMCC service area) and to CGD07 (because the encoded and DOA positions are in the CGD07 SRR). ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO indicates that messages for the site were previously sent to the ICAOLADR (i.e., the ICAO mandated LADR for ELT(DT) alerts), as well as the FMCC and CGD07. This alert was not sent to the LADR, per requirements in document C/S A.001, because an alert with position was already sent to the LADR with a detect time within 3 seconds of the DETECT TIME in the current alert, as evidenced by DETECT TIME “06 122700 MAY” for an encoded position alert in PREVIOUS MESSAGE INFORMATION.

```
/37646 37644/3660/22 140 1230
/372/366M

!!! DISTRESS TRACKING ELT !!!

**** 406 BEACON DOA POSITION MATCH ALERT ****

BEACON ID: 997400 040015 E1B1FF FFFFF      SITE ID: 01211

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A D  28 00.0N  079 00.2W  06 122700 MAY MEO 005 CHMCC  CGD07
N/A  N/A E  28 00.00N 079 00.18W 06 122700 MAY MEO 005 CHMCC  CGD07

DETECTION FREQUENCY: 406.0500 MHZ
FIRST DETECT TIME: 06 122700 MAY
```

```
**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : AUSTRIA          BEACON TYPE: SGB ELTDT
COUNTRY CODE: 203              CRAFT ID   : UNA
MANUFACTURER: TAC     1        MODEL      :
SERIAL NUM  : 1                HOMING     : NIL
POSITION DEVICE: NIL           POSITION RESOLUTION: 18 METERS
ACTIVATION TYPE: MANUAL
CRAFT ID TYPE: AIRCRAFT OPERATOR DESIGNATOR
AIRCRAFT OPERATOR SERIAL NUMBER: 4095

TIME OF GNSS POSITION UPDATE: 06 1202700 MAY
ALTITUDE OF GNSS LOCATION:  8480 METRES (  27822 FEET)
REMAINING BATTERY CAPACITY: BETWEEN 66 AND 100 PERCENT
BEACON CHARACTERISTICS PER TAC DATABASE PROVIDED IN A SEPARATE MESSAGE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION AT RCC VIENNA, MONITORING STATION VIENNA
AFTN: LOWWYCYX
PHONE: 43 1-7988380
FAX: 43 51-70376
EMAIL: RCC.VIENNA@AUSTROCONTROL.AT
WEB: WWW.AUSTROCONTROL.AT

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 06 1228 MAY

THIS ALERT MESSAGE IS BEING SENT TO:
  FMCC,CGD07

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  FMCC,ICAOLADR,CGD07

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A                  06 122640 MAY MEO 002 CHMCC  FMCC
N/A  N/A E  28 00.00N 079 00.18W 06 122700 MAY MEO 002 CHMCC  CGD07
N/A  N/A E  28 00.00N 079 01.02W 06 122655 MAY MEO 001 FL-MEO CGD07
N/A  N/A U  N/A                  06 122650 MAY G16 001 MD1    FMCC

QQQQ
/LASSIT
/ENDMSG
```

4.4 Position Conflict Alert (SIT 173)

This position conflict alert was sent because neither new Doppler position matches the previously received DOA position within 20 km, prior to position confirmation. The new alert is sent to CGD07 (SRR) due to its Doppler positions. Because the previous DOA alert was sent to CGD08 (per ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO), the new alert is also sent CGD08 so that the two RCCs can coordinate the SAR response. The CNMCC is in the message distribution list because the USMCC previously sent a NOCR to the CNMCC due to the beacon COUNTRY being China. The USMCC distribution of new alerts to the NOCR recipient (prior to position confirmation) is a national procedure, and is not required per document C/S A.001.

```
/49264 00000/3660/15 190 1746
/173/366M

**** 406 BEACON POSITION CONFLICT ****

BEACON ID: B388A 28D29 970D1      SITE ID: 98583

**** POSITION DIFFERENCES OF MORE THAN 20 KMS EXIST FOR THIS BEACON ****
**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
52   N/A A  26 40.3N  078 56.6W  24 183829 DEC S12 003 PEMCC  CGD07
48   N/A B  27 22.3N  077 52.6W  24 183829 DEC S12 003 PEMCC  CGD07

DETECTION FREQUENCY: 406.0400 MHZ

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : CHINA            BEACON TYPE: EPIRB MARITIME USER
COUNTRY CODE: 412              CRAFT ID   : 440427         SPECIFIC BEACON: 0
MANUFACTURER:                  MODEL      :
SERIAL NUM  :                  HOMING     : 121.5
POSITION DEVICE: NIL           POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION AT CNMCC
AFTN: ZBBBZSZX
PHONE: 86 10-65292221
FAX: 86 10-65293296
EMAIL: CNMCC(AT)MAIL.EASTNET.COM.CN

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 09 1746 JUL

THIS ALERT MESSAGE IS BEING SENT TO:
  CGD07,CGD08,CNMCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  CGD08,CNMCC
```

```
PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  006 D  29 32.60N 095 02.5W  24 173522 DEC MEO 005 BRMCC  CGD08

QQQQ
/LASSIT
/ENDMSG
```

4.5 Notification of Position Confirmation (SIT 174)

This alert contains a DOA and encoded position that match within 20 km, thereby confirming the beacon position. MCC REFERENCE POSITION provides the MCC estimate of the beacon position. This is the first alert for the site, as ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO indicates "N/A," and the site duration (DURATION) is 0.0 hours. The message title is "406 BEACON INITIAL LOCATED ALERT" because there was no previous alert for the site with location; if there had been a previous alert with location, the title would have been "406 BEACON POSITION UPDATE".

```
/25601 00000/3660/15 190 1652
/174/366B

**** 406 BEACON INITIAL LOCATED ALERT ****

BEACON ID: 2DD43 92E3F 81FE0      SITE ID: 98609

***************  MCC REFERENCE POSITION  ***************

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
40 49.0N 073 05.3W  000.0 HRS  CGD01

**** NEW ALERT INFORMATION ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  005 D  40 49.0N  073 05.3W  09 165059 JUL MEO 003 FMCC
N/A  N/A E  40 48.00N 073 00.27W 09 165059 JUL MEO 003 FMCC

DETECTION FREQUENCY: 406.0275 MHZ
FIRST DETECT TIME: 09 165059 JUL

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: EPIRB SERIAL (NATIONAL)
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER:                  MODEL      :
SERIAL NUM  : 29276            HOMING     : 121.5
POSITION DEVICE: INTERNAL      POSITION RESOLUTION: 4 SECONDS

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION IS NOT AVAILABLE IN THE USMCC DATABASE

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 24 1833 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  CGD01

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO: N/A
```

```
PREVIOUS MESSAGE INFORMATION: N/A

QQQQ
/LASSIT
/ENDMSG
```

4.6 Position Updates after Position Confirmation (SIT 175)

4.6.1 Position Update (SIT 175)

Notes on example: This alert was sent because the DOA position for a new beacon event matched the MCC Reference Position within 20 km. Expected Error (EE) = N/A means that information is not available or not provided because it is considered to be unreliable.

```
/25603 00000/3660/15 190 2216
/175/366B

**** 406 BEACON POSITION UPDATE ****

BEACON ID: 2DD42 EA43F 81FE0      SITE ID: 98592

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
43 49.0N 069 52.1W  000.4 HRS  CGD01

**** POSITION UPDATED FROM THE FOLLOWING ALERT ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  N/A D  43 49.0N  069 52.1W  09 221244 JUL MEO 012 FMCC

DETECTION FREQUENCY: 406.0277 MHZ
FIRST DETECT TIME: 09 221003 JUL

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: EPIRB SERIAL (NATIONAL)
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER:                  MODEL      :
SERIAL NUM  : 23880            HOMING     : 121.5
POSITION DEVICE: INTERNAL      POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 09 2216 JUL

THIS ALERT MESSAGE IS BEING SENT TO:
  CGD01

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  CGD01,CGD05

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  N/A D  43 49.1N  069 52.0W  09 215433 JUL MEO 003 FL-MEO
69   N/A A  43 49.6N  069 52.4W  09 215614 JUL S11 006 AUMCC

QQQQ
/LASSIT
/ENDMSG
```

4.6.2 Position Conflict Alert (SIT 175)

Notes on example: This alert was sent because the DOA position for a new beacon event did not match the MCC Reference Position within 20 km. A position conflict may be due to an inaccurate position sent to the MCC or a moving beacon. Repeated position conflicts for an alert site (without an update to the MCC Reference Position) may indicate that the beacon is moving. Examine new location data from different alert messages to help determine if the beacon is moving.

```
58304 00000/3660/15 190 1846
/175/366J

**** 406 BEACON POSITION CONFLICT ALERT ****

BEACON ID: ADCD0 21885 43401      SITE ID: 98620

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
53 15.4N 162 53.8W  000.5 HRS  CGD17

**** POSITION DIFFERENCES OF MORE THAN 20 KMS EXIST FOR THIS BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  N/A D  53 43.5N  164 04.0W  09 184416 JUL MEO 021 HI-MEO

DETECTION FREQUENCY: 406.0276 MHZ
FIRST DETECT TIME: 09 1834 JUL

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: EPIRB SERIAL CATEGORY I
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: ACR              MODEL      : UNKNOWN
SERIAL NUM  : 34337            HOMING     : 121.5
POSITION DEVICE: NIL           POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 09 1846 JUL

THIS ALERT MESSAGE IS BEING SENT TO:
  CGD17

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  CGD13,CGD17

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  N/A D  53 13.5N  162 58.0W  09 183449 JUL MEO 004 NMCC
N/A  N/A D  53 17.5N  162 52.0W  09 180446 JUL MEO 003 SPMCC

QQQQ
/LASSIT
/ENDMSG
```

4.7 No Detection/Site Status Report (SIT 176 and SIT 376)

The Beacon ID/Site ID Header Line in the SIT 176 and SIT 376 messages indicates the site status, and if the site is closed, the reason why it was closed. The site status (STATUS) has the following possible values:

1) "(OPEN – NO DETECTION)" indicates that the site is still open and no detection has been sent in the last 30 minutes;
2) "(CLOSED - TIMEOUT)" indicates that the site closed because the beacon has not been detected within 2 hours, if the beacon has been detected by a MEOLUT with DOA position or by a GEOLUT, or 6 hours otherwise;
3) "(CLOSED – BY MCC OPERATOR)" indicates that the site was forced closed by the MCC operator (usually at direction of RCC personnel when the beacon has been secured);
4) "(CLOSED – USER CANCELLATION") indicates that the site closed because the beacon was not detected within 15 minutes after the detection of a User Cancellation message; and
5) "(CLOSED – TIME_OPEN)" indicates that the site closed because it was open for 36 hours.

Closing an MCC site is not intended to give the RCC direction on prosecuting a SAR case, but is primarily an MCC administrative function.

US SPOCs that receive SIT 185 messages receive an abbreviated form of the SIT 176 or 376 message when they are a destination for an alert site that closes; see the sample message provided in Section 4.7.6. This site closure message includes a Message Header, the Beacon ID/Site ID Header Line, an Incident Feedback Request (as shown in Annex 6), and a Message Trailer.

If position is confirmed, the SIT 176 or 376 message provides a MCC Reference Position Summary, per Section 3.2.2. These SIT messages do not contain Beacon Decode or Beacon Registration information.

4.7.1 No Detection/Site Status Report (SIT 176) – Site Closure due to Timeout

The following message indicates that the alert site closed due to time. In this case, the beacon was previously detected by a MEOLUT with DOA position, so the alert site closed when it had not been detected for 2 hours.

```
/52520 00000/3660/22 358 0118
/176/366S

**** 406 BEACON NO DETECTION/SITE STATUS REPORT ****

BEACON ID: 2DD78 ED9BF 81FE0      SITE ID: 54750
STATUS: CLOSED - TIMEOUT

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
31 07.3N 066 32.9E  000.9 HRS  AFRCC

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 24 1801 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  AFRCC

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
89   N/A A  31 07.1N  066 32.8E  23 231758 DEC S10 012 AK3
N/A  007 D  31 07.3N  066 33.6E  23 224743 DEC MEO 008 TRMCC
N/A  027 D  31 07.5N  066 33.1E  23 222516 DEC MEO 006 TRMCC

QQQQ
/LASSIT
/ENDMSG
```

4.7.2 No Detection/Site Status Report (SIT 176) – No Detection

The following message was sent because no alert was sent with a detect time within the last 35 minutes; however, this message does not necessarily mean that the beacon was not detected in this period. For example, an unlocated alert with a detect time 15 minutes later than the detect time of the most recently sent alert would not be transmitted, since the detect time of the unlocated alert does not meet the 30-minute threshold for sending a SIT 177 detection update message. The difference between the time that the previous alert was sent and the time that the "no detection" message is generated may exceed 35 minutes when the USMCC processes a significant volume of new alert messages, since the USMCC gives priority to processing new alerts over generating "no detection" messages.

```
/52520 00000/3660/22 357 2353
/176/366S

**** 406 BEACON NO DETECTION/SITE STATUS REPORT ****

BEACON ID: 2DD78 ED9BF 81FE0      SITE ID: 54750
STATUS: OPEN – NO DETECTION

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
31 07.3N 066 32.9E  000.9 HRS  AFRCC

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 23 2353 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  AFRCC

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
89   N/A A  31 07.1N  066 32.8E  23 231723 DEC S10 007 AK3
N/A  005 D  31 07.3N  066 33.6E  23 224744 DEC MEO 008 TRMCC
N/A  012 D  31 07.5N  066 33.1E  23 222551 DEC MEO 006 TRMCC

QQQQ
/LASSIT
/ENDMSG
```

4.7.3 No Detection/Site Status Report (SIT 176) – Site Closed by MCC Operator

The following message indicates that the alert site was closed manually by the USMCC Operator. The RCC Controller should ensure that the 406 MHz beacon has been secured (turned off) before requesting that the USMCC Operator close an alert site, since another alert site will open for the beacon if it continues to transmit.

```
/52520 00000/3660/22 358 0002
/176/366A

**** 406 BEACON NO DETECTION/SITE STATUS REPORT ****

BEACON ID: 2DD78 ED9BF 81FE0      SITE ID: 54750
STATUS: CLOSED - BY MCC OPERATOR

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 24 0101 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  AKRCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  AKRCC

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  007 D  64 11.9N  152 11.9W  23 232559 DEC MEO 006 FL-MEO AKRCC

QQQQ
/LASSIT
/ENDMSG
```

4.7.4 No Detection/Site Status Report (SIT 176) – Site Closed Due to Time Site Open

The following message indicates that the alert site for an FGB was closed because the alert site was open for the maximum time that sites are allowed to stay open, per the time threshold noted in Table 2.1.

```
/52520 00000/3660/22 358 0110
/176/366S

**** 406 BEACON NO DETECTION/SITE STATUS REPORT ****

BEACON ID: 2DD78 ED9BF 81FE0      SITE ID: 54751
STATUS: CLOSED - TIME_OPEN

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
31 07.3N 066 32.9E  035.0 HRS  AFRCC

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 24 0110 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  AFRCC

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
89   N/A A  31 07.1N  066 32.8E  23 231741 DEC S10 011 AK3
N/A  003 D  31 07.3N  066 33.6E  23 224732 DEC MEO 008 TRMCC
N/A  006 D  31 07.5N  066 33.1E  23 222511 DEC MEO 006 NMCC4
N/A  009 D  31 07.6N  066 33.3E  23 220919 DEC MEO 005 HI-MEO

QQQQ
/LASSIT
/ENDMSG
```

4.7.5 No Detection/Site Status Report (SIT 376) – Site Closed Due to Time Site Open

The following message indicates that the alert site for an SGB was closed because the alert site was open for the maximum time that sites are allowed to stay open, per the time threshold noted in Table 2.1. BEACON ID provides the 23-hex ID for the SGB.

```
/52520 00000/3660/22 358 0110
/376/366S

**** 406 BEACON NO DETECTION/SITE STATUS REPORT ****

BEACON ID: AEF7A5 5A40A1 F77CA5 A0C55      SITE ID: 64126
STATUS: CLOSED – TIME_OPEN

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
31 07.3N 066 32.9E  035.0 HRS  AFRCC

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 24 0110 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  AFRCC

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
89   N/A A  31 07.1N  066 32.8E  23 231741 DEC S10 011 AK3
N/A  003 D  31 07.3N  066 33.6E  23 224732 DEC MEO 008 TRMCC
N/A  006 D  31 07.5N  066 33.1E  23 222511 DEC MEO 006 NMCC4
N/A  009 D  31 07.6N  066 33.3E  23 220919 DEC MEO 005 HI-MEO

QQQQ
/LASSIT
/ENDMSG
```

4.7.6 Site Status Report (SIT 176) – Sent to a USA SPOC that Receives SIT 185 Messages

The following message indicates that the alert site was closed based on timeout and that the destination is the Mexico SPOC, a USA SPOC that receives SIT 185 messages. As shown below, site closure messages sent to USA SPOCs that receive SIT 185 messages include the Beacon ID/Site ID Header Line, followed by an Incident Feedback Request (as shown in Annex 6).

```
/02645 00000/3660/22 017 2043
/176/3450

**** 406 BEACON NO DETECTION/SITE STATUS REPORT ****

BEACON ID: DB476 E2E28 D35C1      SITE ID: 46222
STATUS: CLOSED - TIMEOUT

**** INCIDENT FEEDBACK REPORT. SEND REPORT TO USMCC: ****
** 301-817-4568 (FAX), USMCC@NOAA.GOV (EMAIL) OR KZDCZSZA (AFTN) **

BEACON ID: DB476 E2E28 D35C1  SITE ID: 46222  CLOSE TIME: 17 1526 JAN

ACTUAL LOCATION  LAT:         LONG:

INCIDENT OUTCOME:
 DISTRESS / NON-DISTRESS / UNDETERMINED

INCIDENT TYPE:
 AVIATION / MARITIME / TERRESTRIAL / OTHER / UNKNOWN

BEACON REGISTRATION USED TO RESOLVE INCIDENT:
 PRIMARY MEANS / CONTRIBUTED / NOT USED

BEACON REGISTRATION ACCURACY -
 OWNER INFORMATION:          ACCURATE / INACCURATE / UNVERIFIED

 EMERGENCY CONTACT INFO:     ACCURATE / INACCURATE / UNVERIFIED

 VESSEL/AIRCRAFT USAGE INFO: ACCURATE / INACCURATE / UNVERIFIED

SARSAT DATA USED TO RESOLVE INCIDENT:
 YES ONLY NOTIFICATION / YES FIRST NOTIFICATION / YES ASSISTED / NO

NUMBER RESCUED:        NUMBER IN DISTRESS:

REASON ACTIVATED (SELECT ONE):
 DISTRESS: AUTOMATIC / MANUAL / ACTIVATION METHOD UNKNOWN

 FALSE ALERT (SEE CATEGORIES BELOW) -
  BEACON MISHANDLING: INSTALLATION /TEST-MAINTENANCE /USAGE /DISPOSAL

  BEACON MALFUNCTION: SWITCH /WATER INTRUSION /SELF-TEST /ELECTRONICS

  BEACON MOUNTING:  BRACKET FAILURE / HYDROSTATIC RELEASE / MAGNET

  OTHER FALSE ALERT: ENVIRONMENTAL CONDITIONS / REASON UNKNOWN

 UNKNOWN-INCONCLUSIVE
```

```
ACTIVATION COMMENT:


END OF MESSAGE
/LASSIT
/ENDMSG
```

4.8 Detection Update Messages (SIT 177 and 377)

The SIT 177 and 377 detection update messages do not contain Beacon Registration information. MCC Reference Position information is provided if the position is confirmed. All SIT messages generated for new alert data when position is not confirmed are constructed to include a sub-header that indicates "DETECTION TIME AND POSITIONS FOR THE BEACON," as does the SIT 177 message shown in Section 4.8.1. *However, to accommodate a current limitation in RCC alert message parsing software, the sub-header in all SIT 177 messages will indicate "NEW ALERT INFORMATION" per the SIT 177 message shown in Section 4.8.3 until this limitation is resolved.*

4.8.1 Detection Update (SIT 177) – Position Unconfirmed (Final Version)

```
/03934 00000/3660/15 357 0330
/177/366E

**** 406 BEACON DETECTION UPDATE ****

BEACON ID: 2DCE6 DD3BE FFBFF      SITE ID: 54645

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A                 22 020126 DEC S11 002 AK4    AFRCC

DETECTION FREQUENCY: FREQUENCY IS UNRELIABLE

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 22 0330 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  AFRCC

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
54   N/A A  34 04.4S  031 07.0E  22 002344 DEC S12 004 AUMCC  AFRCC /SAMCC
46   N/A B  30 22.4S  051 35.0E  22 002344 DEC S12 004 AUMCC  AFRCC /SAMCC

QQQQ
/LASSIT
/ENDMSG
```

4.8.2 Detection Update (SIT 177) – Position Confirmed

```
/21290 00000/3660/16 137 1026
/177/366S

**** 406 BEACON DETECTION UPDATE ****

BEACON ID: ADCC0 9EF2C 98765      SITE ID: 11003

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
36 56.6N 127 00.9E  004.5 HRS  AFRCC /CENTCO/KOMCC

**** NEW ALERT INFORMATION ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  N/A U  N/A                  16 102022 MAY MEO 001 HI-MEO

DETECTION FREQUENCY: 406.2450 MHZ
FIRST DETECT TIME: 16 102022 MAY

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: ELT SERIAL AVIATION
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: UNKNOWN          MODEL      : UNKNOWN
SERIAL NUM  : 162763           HOMING     : 121.5
POSITION DEVICE: NIL           POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 16 1026 MAY

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC,CENTCOM

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  AFRCC,CENTCOM,JAMCC,CGD17

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  000 D  36 56.1N  127 01.2E  16 094916 MAY MEO 004 HI-MEO
50   N/A B  36 53.6N  126 56.2E  16 093842 MAY S10 003 AK3
N/A  N/A U  N/A                  16 092821 MAY MEO 001 HI-MEO

QQQQ
/LASSIT
/ENDMSG
```

4.8.3 Detection Update (SIT 177) – Position Unconfirmed (Interim Version)

Note: this section will be removed once the limitation described in Section 4.8 is resolved.

```
/03934 00000/3660/15 357 0330
/177/366E

**** 406 BEACON DETECTION UPDATE ****

BEACON ID: 2DCE6 DD3BE FFBFF      SITE ID: 54645

**** NEW ALERT INFORMATION ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A U  N/A                  22 020144 DEC S11 002 AK4    AFRCC

DETECTION FREQUENCY: FREQUENCY IS UNRELIABLE

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 22 0330 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  AFRCC

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
54   N/A A  34 04.4S  031 07.0E  22 002334 DEC S12 004 AUMCC  AFRCC /SAMCC
46   N/A B  30 22.4S  051 35.0E  22 002334 DEC S12 004 AUMCC  AFRCC /SAMCC

QQQQ
/LASSIT
/ENDMSG
```

4.9 Notification of Country of Registration (SIT 178 and 378)

4.9.1 Notification of Country of Registration (SIT 178) – Position Unconfirmed

This Notification of Country of Registration (NOCR) was sent to CGD07 so that CGD07 can distribute the NOCR to SAR authorities for the Bahamas (the COUNTRY encoded in the beacon ID). The NOCR is distributed to SAR authorities for the country of registration when the alert is not located in the SRR of that country, so that responsible agencies in that country can assist the SAR response for its citizens.

```
/24223 00000/3660/15 359 1944
/178/366M

**** NOTIFICATION OF COUNTRY OF REGISTRATION ****

BEACON ID: A6E8D 40D28 D34D1      SITE ID: 54796

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  007 D  57 27.9N  024 11.3E  24 194025 DEC MEO 006 CMCC   NMCC

DETECTION FREQUENCY: 406.0251 MHZ
FIRST DETECT TIME: 24 193943 DEC

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : BAHAMAS          BEACON TYPE: EPIRB MARITIME USER
COUNTRY CODE: 311              CRAFT ID   : 030400         SPECIFIC BEACON: 0
MANUFACTURER:                  MODEL      :
SERIAL NUM  :                  HOMING     : 121.5
POSITION DEVICE: NIL           POSITION RESOLUTION: NONE

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION AT C/S INTERNATIONAL BEACON REGISTRATION DATABASE
PHONE: 242-359-4888
EMAIL: WWW.406REGISTRATION.COM

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 24 1944 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  CGD07,NMCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO: N/A

PREVIOUS MESSAGE INFORMATION: N/A

QQQQ
/LASSIT
/ENDMSG
```

4.9.2 Notification of Country of Registration (SIT 178) – Position Confirmed

When position is confirmed, the Alert Data block in the associated Notification of Country of Registration (NOCR) contains the same information about position confirmation contained in a SIT 174 message.

In the following message, the matching "A" side location and encoded ("E") location confirm position to the SIMCC and VNMCC SRR for a beacon with a USA country code. Per "SRR /BUFFER/BUFF_2", SRR, the beacon is located in an overlap SRR between SIMCC and VNMCC; this is evident because the USMCC does not send alerts for a BUFFER to the VNMCC SRR, as noted in Section 3.2.3.9. The NOCR is sent to CGD14 because the HOME PORT in the BEACON REGISTRATION DATABASE is located in the CGD14 SRR.

```
/32620 00000/3660/22 355 2131
/178/366H

**** NOTIFICATION OF COUNTRY OF REGISTRATION ****

BEACON ID: 2DCC3 F91DE FFBFF      SITE ID: 19548

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
09 04.4N 108 15.8E  000.0 HRS  SIMCC /VNMCC

**** POSITION CONFIRMED FROM THE FOLLOWING NEW INFORMATION ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  002 D  09 04.1N  108 25.6E  10 092931 JUL MEO 003 BRMCC
N/A  N/A E  09 04.53N 108 25.87W 10 092931 JUL MEO 003 BRMCC

DETECTION FREQUENCY: 406.0274 MHZ
FIRST DETECT TIME: 10 092931 JUL

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: EPIRB SERIAL (STANDARD)
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: TAC 127          MODEL      :
SERIAL NUM  : 239              HOMING     : 121.5
POSITION DEVICE: INTERNAL      POSITION RESOLUTION: 4 SECONDS

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

OWNER: MARY JOHNSON
  111 MAIN STREET #101           TEL 1: HOME 8081234567
  HONOLULU                HI     TEL 2:
  96815     USA                  TEL 3:
                                 TEL 4:
  EMAIL:
```

```
CONTACTS: JOSEPH SMITH                JACK JOHNSON
  TEL 1: HOME 7141111111           TEL 1: HOME 3101234567
  TEL 2:                           TEL 2:
  TEL 3:                           TEL 3:
  TEL 4:                           TEL 4:

VESSEL NAME: SAILON
TYPE: SAIL 05 Masts                    LENGTH OVERALL (FT):    47
COLOR: WHITE                           CAPACITY:     8
RADIO CALL SIGN:                       REGISTRATION NO: 911111
RADIO EQP: VHF                         INMARSAT NUMBER:
CELLULAR NUMBER:                       IRIDIUM NUMBER: 8811234567890
MMSI NUMBER:                           AIS NUMBER:

NUMBER OF LIFE BOATS:     0            NUMBER OF LIFE RAFTS:     0

HOME PORT PRIMARY SRR: CGD14           SECONDARY SRR:
HOME PORT: ALA WAI MARINA               HONOLULU                    HI

MANUFACTURER: ACR                      MODEL NUMBER: 406
ACTIVATION TYPE: CAT2(MANUAL)

BEACON CONTAINS SVDR: NO

DATE FIRST REGISTERED: 10 FEB 2010    DATE REG EXPIRES: 21 OCT 2024
DATE LAST UPDATED: 21 OCT 2022

REMARKS:

SPECIAL STATUS:                       SPECIAL STATUS DATE:
SPECIAL STATUS INFO:


**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 20 2131 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  CGD14,SIMCC,VNMCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO: N/A

PREVIOUS MESSAGE INFORMATION: N/A

QQQQ
/LASSIT
/ENDMSG
```

4.9.3 Notification of Country of Registration (SIT 378)

This SGB alert is an NOCR that was sent to CGD07 because the country code (Cayman Islands, in the USA Service Area) is associated with a different SRR than the encoded position, which is in Mexico. Per Annex 14, NOCRs for the Cayman Islands are distributed to CGD07. This UNCORROBORATED MEOSAR ALERT is distributed because the data SOURCE (FL-MEO) is commissioned for processing anomalies (i.e., its rate of generating anomalous alerts is sufficiently low that its uncorroborated MEOSAR alerts are distributed to RCCs and SPOCs). This alert does not contain an MCC Reference Position, which indicates that the position is not confirmed.

```
/07365 00000/3660/22 081 0734
/378/366M

**** NOTIFICATION OF COUNTRY OF REGISTRATION ****

BEACON ID: A7F4C8 6919F0 772624 BB41B      SITE ID: 64281

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A E  21 20.12N 95 59.43W  22 072931 MAR MEO 001 FL-MEO MEXISP

DETECTION FREQUENCY: NOT AVAILABLE
FIRST DETECT TIME: 22 072931 MAR
UNCORROBORATED MEOSAR ALERT
  WARNING: SECOND GENERATION BEACON (NOT OPERATIONAL)

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : CAYMAN IS        BEACON TYPE: SGB PLB RETURN LINK
COUNTRY CODE: 319              CRAFT ID   :
MANUFACTURER:                  MODEL      :
SERIAL NUM  : 4511             HOMING     : NIL
POSITION DEVICE: NIL           POSITION RESOLUTION: 18 METERS

RLS PROVIDER: UNKNOWN
RLM TYPE-2 RECEIVED (MANUAL ACKNOWLEDGEMENT)

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION AT CAYMAN ISLANDS SHIPPING REGISTER
PHONE: 44 1489-799203
FAX: 44 1326-319264
EMAIL: CISRUK@CISHIPPING.COM

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 22 0734 MAR

THIS ALERT MESSAGE IS BEING SENT TO:
  MEXISP,CGD07

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO: N/A

PREVIOUS MESSAGE INFORMATION: N/A

QQQQ
/LASSIT
/ENDMSG
```

4.10 Encoded Position Update (SIT 179)

4.10.1 Encoded Position Update (SIT 179) – Position Unconfirmed, ELT(DT)

An Encoded Position Update message may contain Doppler or DOA position data when the Doppler or DOA position data is redundant (i.e., a message for same beacon event was already sent) but the encoded position has changed by more than 3 km (about 1.6 NM) or the first refined encoded position is available for an FGB. In this alert, the value of "E" for SOL indicates that the encoded position is provided. Note that "encoded" position is referenced as "GNSS" position in the SIT 185 message.

The special header (!!! DISTRESS TRACKING ELT !!!) before the message title and the BEACON TYPE indicate that this alert is for an ELT(DT). The DETECT TIME of the new alert (27 150035 JUL) is 5 seconds after the DETECT TIME of the most recent alert provided in PREVIOUS MESSAGE INFORMATION (27 150030 JUL), consistent with the fact that ELT(DT)s transmit every 5 seconds in the first 120 seconds after activation. There are 5 previous alerts with detect times within 30 seconds of the detect time of the new alert, consistent with the fact that each new ELT(DT) transmission is sent to the RCC within the first 30 seconds after activation; after 30 seconds, the time threshold for sending a new alert is 10 minutes.

The encoded (i.e., GNSS) POSITION RESOLUTION is 4 SECONDS, the ALTITUDE OF GNSS LOCATION is provided as a range in feet and meters, the associated UPDATE TIME is WITHIN 0 – 2 SECONDS OF DETECTION TIME. Field AIRCRAFT 24 BIT ADDRESS ASSIGNED TO indicates that the 24-bit aircraft address (24 BIT ADDR) is assigned to Canada. Because an AIRCRAFT OPERATOR DESIGNATOR is available, information for this new ELT(DT) transmission is sent to the ICAO LADR as well as the AFRCC, as shown in field THIS ALERT MESSAGE IS BEING SENT TO.

```
/08061 00000/3660/22 208 1501
/179/366S
SITE ID: 37538

!!! DISTRESS TRACKING ELT !!!

**** 406 BEACON ENCODED POSITION UPDATE ****

BEACON ID: 2DD26 0409A 3FDFF      SITE ID: 37538

**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A E  37 40.00N 097 26.33W 27 150035 JUL G16 001 MD1    AFRCC

DETECTION FREQUENCY: 406.0232 MHZ

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: ELTDT A/C ADDRESS
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER:                  MODEL      :
24 BIT ADDR : HEX=C08134       HOMING     : NIL
POSITION DEVICE: NIL           POSITION RESOLUTION: 4 SECONDS
```

```
ACTIVATION TYPE: MANUAL
AIRCRAFT OPERATOR DESIGNATOR: BBA
  AIRCRAFT 24 BIT ADDRESS ASSIGNED TO CANADA

ALTITUDE OF GNSS LOCATION:
 BETWEEN 400 AND 800 METRES (BETWEEN 1300 AND 2600 FEET)
UPDATE TIME WITHIN 0 - 2 SECONDS OF DETECTION TIME

 6 IHDB record(s) found, most recent: 2020-12-25.

**** BEACON REGISTRATION DATABASE INFORMATION ****

REGISTRATION INFORMATION IS NOT AVAILABLE IN THE USMCC DATABASE

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 27 1500 JUL

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC,ICAOLADR

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  AFRCC,ICAOLADR

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  N/A E  37 30.00N 097 30.00W 27 150030 JUL G16 001 MD1    AFRCC
N/A  N/A E  37 40.00N 097 26.33W 27 150025 JUL G17 001 MD2    AFRCC
N/A  N/A E  37 40.00N 097 26.33W 27 150015 JUL G17 001 MD2    AFRCC
N/A  N/A E  37 40.00N 097 26.33W 27 150005 JUL G17 001 MD2    AFRCC
N/A  N/A E  37 30.00N 097 30.00W 27 150010 JUL G16 001 MD1    AFRCC

QQQQ
/LASSIT
/ENDMSG
```

4.10.2 Encoded Position Update (SIT 179) – Position Confirmed

```
/22190 00000/3660/22 190 0405
/179/366S

**** 406 BEACON ENCODED POSITION UPDATE ****

BEACON ID: 2DCE7 03C2C FFBFF      SITE ID: 98457

**** MCC REFERENCE POSITION ****

LATITUDE LONGITUDE  DURATION   SRR   /BUFFER/BUFF_2
40 36.0N 115 25.4W  000.3 HRS  AFRCC

*****************  NEW ALERT INFORMATION  ****************

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  N/A E  40 34.93N 115 22.87W 09 040324 JUL MEO 002 HI-MEO

DETECTION FREQUENCY: 406.0272 MHZ
FIRST DETECT TIME: 09 040324 JUL

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA              BEACON TYPE: PLB SERIAL (STANDARD)
COUNTRY CODE: 366              CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER: TAC 224          MODEL      :
SERIAL NUM  : 7702             HOMING     : 121.5
POSITION DEVICE: INTERNAL      POSITION RESOLUTION: 4 SECONDS

 6 IHDB record(s) found, most recent: 2020-12-25.

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 09 0405 JUL

THIS ALERT MESSAGE IS BEING SENT TO:
  AFRCC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  AFRCC

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE
N/A  003 D  40 34.9N  115 22.8W  09 034912 JUL MEO 005 FL-MEO
N/A  N/A E  40 34.87N 115 22.93W 09 034912 JUL MEO 005 FL-MEO

QQQQ
/LASSIT
/ENDMSG
```

5 SUPPORT MESSAGES

As noted in Table 2.4, support messages contain a standard message header, support message data, and a message trailer. The different support messages are described below, with examples provided. Definitions for the different fields in support messages are provided in Annex 1.

Except for Section 5.5, this section has not been updated for the MEOSAR system.

5.1 Narrative Message (SIT 950)

This message is used to transmit a narrative message to the RCC. It may be used to indicate a System status change, including satellite, LUT, or MCC failures. A sample message follows.

```
/22664 00000/3660/12 346 1710
/950/366A
/TO:  ALL RCCS
FROM: USMCC
SUBJECT: USMCC RESUMES NORMAL OPERATIONS

THE USMCC RESUMED NORMAL OPERATIONS AT 12/11/2012 1710 UTC.

PLEASE CALL 301-817-4576 TO CONFIRM RECEIPT OF THIS MESSAGE.

USMCC CONTROLLER

QQQQ
/LASSIT
/ENDMSG
```

5.2 Alert Site Query Report (SIT 951) – NOTE: This was not updated for the LGM MCC

This message is sent in response to an RCC's request for alert site information, based on a specified time period, geographical area (defined as a rectangle or point and radius), site ID, or 406 MHz beacon ID.

This message provides the SEARCH CRITERIA. The NORTH BOUNDARY, SOUTH BOUNDARY, EAST BOUNDARY, and WEST BOUNDARY are provided for a geographical area defined as a rectangle. The CENTER POSITION and RADIUS are provided for a geographical area defined as a point and radius. The REPORT START and REPORT END are provided for the specified time period. The SITE ID and BEACON ID used to define the search are also provided. SEARCH RESULTS include the LATITUDE and LONGITUDE

The following is a sample report for a query based on time range and SITE ID.

```
/51787 00000/3660/12 349 1631
/951/366S
/TIME OF QUERY:   2012-12-14 16:31

                          SEARCH CRITERIA
CENTER POSITION: NONE             RADIUS:         NONE
NORTH BOUNDARY:  NONE             EAST BOUNDARY:  NONE
SOUTH BOUNDARY:  NONE             WEST BOUNDARY:  NONE
REPORT START:    14 0758 DEC 12   REPORT END:   14 1159 DEC 12
SEARCH FREQ:     406              SITE ID:        54067
BEACON ID:       N/A              COUNTRY CODE:   N/A
MMSI, SHIP CALL SIGN, OR AIRCRAFT REGISTRATION:  N/A
TRACK BOUNDARY:  N/A

                            SEARCH RESULTS
LATITUDE LONGITUDE FIRST TCA   DUR FREQ SWP SITE/BEACON ID
26 10.9N 080 10.0W 14 1314 DEC 2.0  406 UNK E0E64D6F6553191

                       DETAIL INFORMATION
BEACON ID:    E0E64D6F6553191       SITE ID:    54067

SITE CREATED:        14 1315 DEC 12 SITE CLOSED: N/A
FIRST TCA:           14 1314 DEC 12 LAST TCA:    14 1511 DEC 12
LAST DATA PROCESSED: 14 1559 DEC 12 PASSES:      7

REASON CLOSED:
MESSAGE DESTINATIONS: SPMCC, CGD07, AFRCC, VZMCC


                     DETECTION TIME AND POSITIONS
SOL LATITUDE LONGITUDE DETECT TIME    SAT SOURCE  SRR\BUFFER  PROB
U                      14 1314 DEC    G16 SPMCC2  0000\0000   0
B   26 11.4N 080 11.4W 14 1329 DEC    S11 MULTI   366S\366M   45
A   26 10.6N 080 09.5W 14 1342 DEC    S9  MULTI   366S\366M   50
A   26 11.8N 080 10.7W 14 1411 DEC    S8  MULTI   366S\366M   89
A   26 11.1N 080 08.9W 14 1510 DEC    S11 MULTI   366S\366M   54
```

```
             BEACON NOT DETECTED ON FOLLOWING PASSES
DETECT TIME SAT SOURCE MISSPASS

                     NEXT PASS INFORMATION
SITE ID SOL  DETECT TIME  SAT SOURCE VISIBILITY
5C54067  C   14 1705 DEC  S12  FL1    LOW (NOT COUNTED AS MISSED PASS)
5C54067  C   14 1845 DEC  S12  FL1    HIGH

QQQQ
/LASSIT
/ENDMSG
```

5.3 406 MHz Beacon Registration (SIT 952)

This message contains 406 MHz beacon registration information. The narrative text shows the BEACON ID, the SITE ID (if applicable), a header line with information about receipt of the associated message from another MCC (if applicable) and the beacon registration information. For USA-coded beacons, the registration information is provided in the same format as in alert messages (see Section 3.4). For non-USA-coded beacons, the registration information is provided in the format the information is received from the other MCC.

This message is sent in response to an RCC's request for 406 MHz beacon registration information, based on a specified beacon ID, craft ID (e.g., tail number or radio call sign), vessel name, or owner name. It is also sent automatically when the USMCC receives registration information from a foreign MCC in a SIT 925 message for a non-USA coded beacon; in this case, the USMCC appends a header line to the registration information that provides the USMCC input message number, the sending MCC name and the time the message was sent to the USMCC.

The example below provides registration information for a French FGB.

```
/58612 00000/3660/15 307 2243
/952/CGOP
/
BEACON ID: 9C690 64D65 034D1      SITE ID: 09033
MESSAGE# 66391 WAS SENT TO THE USMCC BY FMCC AT 15 307 2242


FM FMCC COSPAS-SARSAT TOULOUSE
TO USMCC
FMCC REF NO 77062
HEXACODE : 9C69064D65034D1
REF 406 BEACON : 320230/0, COUNTRY : 227/FRANCE
VESSEL FLAG:227 MMSI:227320230
QU:BA REGISTRATION NUMBER:334732P RCS:FP6446
NAME:ITSAS BELLARA TYPE:FISHING
LENGTH:15
OWNER
MRCC GRIS NEZ
TEL:+33 3 21 87 21 87

QQQQ
/LASSIT
/ENDMSG
```

5.4 Beacon-LUT Mutual Visibility Schedule (SIT 953)

This message is used to transmit a list of LEOSAR satellite passes that have mutual visibility with a USA LEOLUT and a specified location. The Support Data provides predicted the DETECT TIME, SAT (satellite), SOURCE (US LUT), and VISIBILITY.

```
/50745 00000/3660/12 339 1650
/953/366S
/NEXT TIME SIGNAL SHOULD BE DETECTED FOR POSITION 28 09.0N,082 46.0W
FOR THE NEXT 6 PASSES
AT ELEVATION ANGLE UNKNOWN DEGREES FOR FREQUENCY 406

DETECT FREQ    DETECT-TIME  SAT   SOURCE VISIBILITY
406            04 1656 DEC  S11    LSE    LOW
406            04 1712 DEC  S12    FL1    LOW
406            04 1852 DEC  S12    FL1    HIGH
406            04 1928 DEC  S10    FL2    HIGH
406            04 2109 DEC  S10    FL1    HIGH
406            04 2110 DEC  S7     FL2    HIGH

QQQQ
/LASSIT
/ENDMSG
```

5.5 Operational Characteristics for an SGB TAC (SIT 956)

This message is used to transmit information about the operational characteristics for an SGB, based on the TAC number encoded in the beacon message. If TAC-related information is available for an SGB, the USMCC sends a single SIT 956 message to each RCC message destination (and a single SIT 985 message to each SPOC message destination) for the alert site, immediately after the USMCC sends the first alert message to the respective destination for the alert site. The SIT 985 message also contains transmit information about the operational characteristics for an SGB and is specified in document C/S A.002.

The USMCC maintains a local copy of the TAC database, based on the master TAC database maintained by C/S on the C/S website. Information from the master TAC database is distributed to each MCC via the MCC nodal network, so that each MCC can maintain a local copy of the TAC database. *Note that the TAC database is not yet implemented, and the associated C/S website link is TBD.*

A sample SIT 956 message is provided below.

```
/50745 00000/3660/12 339 1650
/956/366S

BEACON ID: AB3410 6E70D0 000000 00000      SITE ID: 27172

CHARACTERISTICS FOR TAC   12345
  - MANUFACTURER: APPLIED TECHNOLOGY CORP.
  - BEACON MODEL: XXXYYY-01234
- BEACON TYPE: PLB
- BEACON SUBTYPE: FLOAT-FREE
- TEMPERATURE RANGE: -40C +55C
- HOMING: 121.5=5 MW - 406=25 MW
- AIS=20 MW - NAV DEVICE: GALILEO, GLONASS
- STROBE: BRIGHTNESS=0.75 CANDELA, DUTY-CYCLE=15 FLASH/MINUTE

QQQQ
/LASSIT
/ENDMSG
```

6 SIT 185 ALERT MESSAGES SENT TO SPOCs AND NON-CAPABLE MCCs

6.1 SIT 185 Message Format - Overview

As described in document C/S A.002, the SIT 185 alert message is composed of 6 sections (numbered 1 through 6) and a final unnumbered data line with the words “END OF MESSAGE.” Table C-3 of document C/S A.002 contains an overview of the SIT 185 message content.

As approved by the C/S Council in March 2022, this SIT 185 message format is organized to be more readily understood, compared to the previous version of the SIT 185 message, which had 16 numbered sections. A key feature of the new SIT 185 message format is that the term “MCC Reference Position” replaces the legacy term “Confirmed Position,”, to discourage SAR personnel from assuming that this position is known to be the actual beacon position. The new format also includes the term “GNSS” position rather than the term “encoded” position. The new format is provided in all sample SIT 185 messages, except when otherwise noted.

The re-organized SIT 185 message format is not yet implemented in all MCCs, which may affect communication by USA RCCs and SPOCs with SPOCs that receive alert message from MCCs other than the USMCC. In particular, the re-organized SIT 185 message format is not yet implemented in the CMCC, which sends alerts to USA RCCs and SPOCs when it backs up the USMCC, as described in Section 2.1.6.

As noted in Section 1.2, USA nationally formatted messages are sent to all USA RCCs and some USA SPOCs. USA SPOCs that do not receive the nationally formatted messages sent to all USA RCCs are sent SIT 185 messages as described in document C/S A.002, which provides the general format used by all C/S MCCs to distribute alert data to SPOCs. Features of the SIT 185 message that are particular to the USMCC are described below.

The USMCC also sends SIT 185 messages to Canadian RCCs when it backs up the CMCC and to the Chile RCC and the Chilean SPOCs when it backs up the CHMCC.

In addition, the USMCC sends SIT 185 alert messages embedded in a SIT 915 (narrative) message (described in C/S A.002) to other MCCs, when the immediate MCC destination is not capable of processing the associated type of alert data automatically (i.e., in MCC -to-MCC format), in accordance with document C/S A.001. For example, if the immediate destination MCC is not capable of processing MEOSAR alerts automatically, then the USMCC will send the alert message in a SIT 185 message embedded in a SIT 915 message. In a similar manner, the USMCC will send a SIT 185 message embedded in a SIT 915 message to an MCC for an SGB alert if that MCC is not capable of processing SGB alerts automatically.

Per an agreement with the CMCC, when the USMCC sends SIT 185 alert messages to the CMCC, the message content is embedded in the SIT 925 message format rather than the SIT 915 message, where the SIT 925 message is used to send beacon registration data between MCCs, as described in C/S A.002. The

use of the SIT 925 message format, which contains the 15-digit beacon ID, enables CMCC's SARMASTER software to automatically provide the alert message to the CMCC Operator based on the associated beacon ID.

USA SPOCs that receive SIT 185 messages are also sent a special form of the alert site closure message, as described in Section 4.7.

6.2 Special Features of SIT 185 Alert Messages sent to SPOCs by the USMCC

6.2.1 Message Header and Message Trailer

Prior to the standard message content described above, SIT 185 messages sent by the USMCC contain two header lines that conform to the message header definitions in C/S A.002 used to exchange messages between MCCs, as described in Section 3.1. Following the "END OF MESSAGE" data line, SIT 185 messages sent by the USMCC also contain a message trailer as described in Section 3.7.

6.2.2 OTHER INFORMATION – Beacon Manufacturer and Model

In section 5 ("OTHER INFORMATION"), the USMCC provides the MANUFACTURER and MODEL number of the beacon for serial user protocol beacons that contain a USA country code, as described in Section 3.3.1.

6.2.3 OTHER INFORMATION – Indicating a Beacon Test

While most coordinated beacon tests do not involve the distribution of alerts to SPOCs or RCCs, on occasion it is appropriate to distribute alerts to SPOCs and RCCs for a coordinated beacon test. When operational alert distribution is agreed for a test coordinated with the USMCC, the USMCC will:

a) provide advance notification to USA SPOCs and RCCs that are expected to be affected, and
b) provide a note in the "OTHER INFORMATION" field indicating:

CAUTION: BEACON TEST XXX

where "BEACON TEST XXX" provides information about the specific beacon test, based on USMCC configuration. See related information in Section 3.3.3.

6.2.4 OTHER INFORMATION – Source LUT and Beacon Registry Information

The USMCC identifies the LUT that generated the alert, as a 4-digit number (per Message Field 11 in document C/S A.002) and with an associated name per Section 3.2.3.8. For example, "LUT: 3669/FL_MEO" indicates that the alert data source is the Florida MEOLUT with associated identification number 3669.

This field also provides beacon registry point of contact information for both USA and non-USA coded beacons, as described in Section 3.4.7. This field does not provide registration information for specific

USA-coded beacons, whereas alert messages sent to USA RCCs provide registration information for USA-coded beacons, as available.

6.2.5 OTHER INFORMATION – Improved Doppler "A" Position Probability

As noted in Table 2.1, a Located First Alert Update is sent to a USA RCC as a SIT 172 message prior to position confirmation, when an alert with Doppler location was previously sent to the RCC and updated information regarding the A/B probability is available for the same satellite pass indicating that the "A" side probability in the new solution is at least 15% higher than the "A" side probability in all previously sent same pass solutions. This notification of an improved "A" side probability is sent per USMCC national procedures, beyond what is required of C/S MCCs.

In such cases, if a message destination is a USA SPOC that receives SIT 185 messages, then a SIT 185 Position Update message is sent to the SPOC with text in the "OTHER INFORMATION" field that indicates "IMPROVED PROBABILITY REPORTED FOR THE A POSITION".

6.2.6 Exclusion of Unneeded Field Titles and Blank Characters

For some destinations that receive alert message via AFTN (including USA SPOCs and foreign MCCs), the maximum AFTN message size is 1800 characters, which is the AFTN standard per document C/S A.002. As described in A.002, the USMCC excludes leading blanks in data lines, field titles with no associated data, and blank lines from the SIT 185 message, as practical, to help ensure that messages do not exceed this size limit. The reduction in message size is particularly important for alert messages sent for ELT(DT)s and SGBs, which often contain more information than other alert messages.

For example, in SIT 185 message section entitled "ALERT POSITION INFORMATION" and numbered "4.," data lines with no associated position data (such as the "DOPPLER A" and "DOPPLER B" positions for a MEOSAR alert) are excluded. When section "BEACON MESSAGE INFORMATION" indicates "DATA DECODED FROM THE BEACON MESSAGE IS NOT RELIABLE," this section only contains the HEX ID field.

6.2.7 OTHER INFORMATION – Special MIDs for EPIRBs

As described in Section 3.3.1, the ITU has assigned special MIDs for use in EPIRBs where the MID does not correspond to the country of registration. In SIT 185 messages generated for these special MIDs, the USMCC sets the name for the Country of Beacon Registration in Section 3 ("BEACON MESSAGE INFORMATION") and provides a note in Section 5 ("OTHER INFORMATION"), per Table 3.3.2.

6.2.8 Sample SIT 185 Messages Sent by the USMCC

6.2.8.1 Sample FGB Position Confirmation Alert with Doppler Position (Current Format)

The following sample shows the current (re-organized) SIT 185 message format for an alert sent to COCESNA (destination code "CNAM") when a new alert with Doppler position was used to confirm the beacon position. The presence of the field entitled "MCC REFERENCE" in the message section entitled "ALERT POSITION INFORMATION" indicates that the beacon position has been "confirmed" by the match of positions from independent sources within 20 km. Section 3.2.2.1 describes procedures related to Position Confirmation.

For comparison, Section 6.2.7.2 contains the corresponding alert sent to COCESNA in the legacy SIT 185 message format. While the current format contains 6 numbered sections, the legacy format contains 16 numbered sections. The current sample refers to the "MCC Reference" position instead of the "Confirmed" position and excludes most fields with a NIL value.

```
/68205 00000/3660/21 159 1320
/185/CNAM
/
1.  DISTRESS COSPAS-SARSAT POSITION UPDATE ALERT

2.  MSG NO. 68205 USMCC REF 09272

3.  BEACON MESSAGE INFORMATION
    BEACON TYPE  EPIRB SERIAL  ID  201417
    HEX ID ADCE4C4B24002E9
    COUNTRY OF BEACON REGISTRATION 366/USA
    HOMING SIGNAL 121.5

4.  ALERT POSITION INFORMATION
    DETECTED AT 08 JUN 21 1319 UTC BY SARSAT 07
  MCC REFERENCE - 25 53.9N 080 16.8W
  DOPPLER A - 25 55.9N 080 19.0W PROB 50

5.  OTHER INFORMATION
    BEACON MANUFACTURER / MODEL:  TAC 186
  LUT: 3163/CMCC

 REGISTRATION AT USMCC
AFTN: KZDCZSZA
PHONE: 1 301-817-4576
FAX: 1 301-817-4568
EMAIL: USMCC@NOAA.GOV
    DETECTION FREQUENCY 406.0369 MHZ

6.  REMARKS
    NIL

END OF MESSAGE
QQQQ
/LASSIT
/ENDMSG
```

6.2.8.2 Sample FGB Position Confirmation Alert with Doppler Position (Legacy Format)

The following Position Confirmed alert was sent to COCESNA when a new alert with Doppler position was used to confirm the beacon position. This alert contains the legacy SIT 185 message format, whereas Section 6.2.7.1 contains the same alert in the current SIT 185 message format.

```
/68205 00000/3660/21 159 1320
/185/CNAM
/
1.  DISTRESS COSPAS-SARSAT POSITION CONFIRMED ALERT

2.  MSG NO. 68205 USMCC REF 09272

3.  DETECTED AT 08 JUN 21 1319 UTC BY SARSAT 07

4.  DETECTION FREQUENCY 406.0369 MHZ

5.  COUNTRY OF BEACON REGISTRATION 366/USA

6.  USER CLASS - EPIRB SERIAL  ID  201417

7.  EMERGENCY CODE NIL

8.  POSITIONS
  CONFIRMED - 25 53.9N 080 16.8W
  DOPPLER A - 25 55.9N 080 19.0W PROB 50

9.  ENCODED POSITION PROVIDED BY: NIL

10. NEXT PASS / EXPECTED DATA TIMES
     CONFIRMED - MEOSAR DATA USUALLY SENT WITHIN 15 MINUTES
     DOPPLER A - NIL
     DOPPLER B - NIL
     DOA - NIL
     ENCODED - NIL

11. HEX ID ADCE4C4B24002E9 HOMING SIGNAL 121.5

12. ACTIVATION TYPE NIL

13. BEACON NUMBER ON AIRCRAFT OR VESSEL NIL

14. OTHER ENCODED INFORMATION
    BEACON MANUFACTURER / MODEL:  TAC 186

15. OPERATIONAL INFORMATION
 LUT: 3163/CMCC
 REGISTRATION AT USMCC
AFTN: KZDCZSZA
PHONE: 1 301-817-4576
FAX: 1 301-817-4568
EMAIL: USMCC@NOAA.GOV
```

```
16. REMARKS
    NIL

END OF MESSAGE
QQQQ
/LASSIT
/ENDMSG
```

6.2.8.3 Sample FGB MEOSAR Alert Message for the CMCC

A sample FGB MEOSAR alert sent to the LG-capable CMCC follows. This message is sent to the CMCC in a SIT 185 message because the CMCC is not capable of processing this type of alert (i.e., a MEOSAR alert) in MCC to MCC SIT format automatically. Per C/S standards, a SIT 185 message is sent to a "non-capable" MCC wrapped in a SIT 915 message; however, the SIT 185 messages sent to the CMCC are wrapped in a SIT 925 message format to enable the CMCC to process the alert message based on the 15-Hex beacon ID, as noted above. Note that FGB alerts contain a 15-hex beacon ID in field "HEX ID" but no explicit reference to "FGB," whereas SGB alerts contain a 23-hex beacon ID in field "HEX ID" and "SGB" in field "BEACON TYPE". See the sample SGB alert in Section 6.2.7.4.

Once the CMCC becomes LGM capable, the USMCC will send MEOSAR alerts for FGBs, except ELT(DT)s, in the standard MCC to MCC SIT message format (e.g., a SIT 145 message for an initial alert with DOA location). The CMCC will continue to receive a SIT 185 message wrapped in the SIT 925 message format for FGB ELT(DT) and SGB alerts, until it can automatically process alerts for these types of beacons, respectively.

```
/50867 00000/3660/21 160 1335
/925/3160
/A78DF01878002F1
/
1.  DISTRESS COSPAS-SARSAT INITIAL LOCATED ALERT

2.  MSG NO. 50867 USMCC REF 09508

3.  BEACON MESSAGE INFORMATION
    BEACON TYPE  ELT SERIAL A/C 24BIT ADDRESS  ID  HEX=C061E0
    HEX ID A78DF01878002F1
    COUNTRY OF BEACON REGISTRATION 316/CANADA
    BEACON NUMBER ON AIRCRAFT OR VESSEL NO. 0
    HOMING SIGNAL 121.5

4.  ALERT POSITION INFORMATION
    DETECTED AT 09 JUN 21 1334 UTC BY MEOSAR
    MEOSAR ALERT LAST DETECTED AT 09 JUN 21 1334
  DOA - 48 30.5N 071 04.1W ESTIMATED ERROR 2 NMS

5.  OTHER INFORMATION
    BEACON MANUFACTURER / MODEL:  TAC 188
  LUT: 3669/FL-MEO
```

```
 REGISTRATION AT CMCC
PHONE: 1 613-965-7265
FAX: 1 613-965-7494
EMAIL: CBR@SARNET.DND.CA
WEB: HTTP://WWW.CBR-RCB.CA
    DETECTION FREQUENCY 406.0276 MHZ

6.  REMARKS
    NIL

END OF MESSAGE
QQQQ
/LASSIT
/ENDMSG
```

6.2.8.4 Sample SGB ELT(DT) Cancellation Message

A sample SGB ELT(DT) cancellation message for MEXISP (the Mexico SPOC) is provided below. Unlike other alerts, ELT(DT) alerts indicate “DISTRESS TRACKING” in Section “1.” In Section “3” (BEACON MESSAGE INFORMATION), SGB alerts contain a 23-hex beacon ID in field HEX ID (composed of 12 hexadecimal digits, a blank character, and 11 trailing hexadecimal digits), and “SGB” in field “BEACON TYPE”. The MCC sends a cancellation message to a SPOC or RCC when the cancellation is confirmed based on the receipt of three separate cancellation messages with detect times within 110 seconds (with no intervening non-cancellation messages), and line “5” accordingly indicates “CANCELLATION CONFIRMED”. An activation can only be cancelled using the same means that triggered the activation (i.e., by avionics or manually).

In Section “4”, the First Detect Time and the Last Detect Time for an SGB MEOSAR alert provide the time of day with seconds of the minute (e.g., “131120,” meaning 13 hours, 11 minutes, 20 seconds). The detect times for FGB ELT(DT) alerts are also provided with seconds of the minute, but detect times for other FGB alerts are only provided with minutes of the hour (e.g., “1311,” meaning 13 hours, 11 minutes).

```
/72432 00000/3660/21 117 1313
/185/3450
/
1.  DISTRESS TRACKING COSPAS-SARSAT USER CANCELLATION ALERT

2.  MSG NO. 72432 USMCC REF 53553

3.  BEACON MESSAGE INFORMATION
    BEACON TYPE  SGB ELTDT  ID 0F0F0F
    VESSEL ID TYPE: AIRCRAFT 24 BIT ADDRESS
    AIRCRAFT OPERATOR DESIGNATOR OTR
    TAC 65532 SERIAL NO 3015
    HEX ID ADF7FFF0BC74 0F0F0F18540
    COUNTRY OF BEACON REGISTRATION 367/USA
    ACTIVATION TYPE AUTOMATIC BY EXTERNAL MEANS (AVIONICS)

4.  ALERT POSITION INFORMATION
    DETECTED AT 27 APR 21 131120 UTC BY MEOSAR
    MEOSAR ALERT LAST DETECTED AT 27 APR 21 131120
  GNSS - 15 22.87N 117 08.56W
```

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5.  OTHER INFORMATION
  GNSS POSITION UNCERTAINTY: PLUS-MINUS 10 METRES
  LUT: 3385/HI-MEO

CANCELLATION CONFIRMED
ELT(DT) POSITION DOES NOT REFERENCE ANY PREVIOUS POSITION
 REGISTRATION AT USMCC
PHONE: 1 301-817-4576
EMAIL: USMCC@NOAA.GOV
    DETECTION FREQUENCY 406.0500 MHZ

6.  REMARKS
THIS DISTRESS TRACKING MESSAGE IS BEING SENT TO APPROPRIATE SAR
AUTHORITIES. PROCESS THIS ALERT ACCORDING TO RELEVANT REQUIREMENTS

END OF MESSAGE
QQQQ
/LASSIT
/ENDMSG
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ANNEX 1 - ALERT AND SUPPORT MESSAGE DEFINITIONS

This Annex defines the fields and terms used in alert and support messages transmitted by the USMCC. "N/A" means either that the information is not applicable or not available.

The beginning of the definition column indicates the alert message section and/or support message in which the term is used. Beacon Registration data in an alert or support message is based on information reported by the beacon owner or operator. Information provided for the "Incident Feedback Request" should also be used when incident feedback is provided directly into the IHDB. For terms defined in the "Incident Feedback Request" section of the alert message, see Annex 12.

Term	Alert Message Section	Support Message
	Definition	
ACTIVATION COMMENT	**Incident Feedback Request** Description of beacon activation.	
ACTIVATION TYPE	**Beacon Decode Data Block Beacon Registration Data Block Beacon Registration** In the Beacon Decode Data Block, this is the activation method of the beacon, as indicated in the beacon message; Section 3.3.3 provides further details. In the Beacon Registration Data Block and Beacon Registration, this is the activation method of an FGB EPIRB, as decoded from the 15 hexadecimal beacon ID. CAT1 means that the FGB EPIRB can be activated either manually or automatically. CAT2 means that the FGB EPIRB can only be activated manually.	
ACTUAL LOCATION	**Incident Feedback Request** The actual location of the beacon as determined by the SAR forces.	
AFTN	**Beacon Registration Data Block** AFTN address point of contact for beacon registry for non-USA beacon.	
AIRCRAFT MANUFACTURER/ MODEL	**Beacon Registration Data Block Beacon Registration** Manufacturer and model of the aircraft on which the ELT is carried.	
AIRCRAFT OPERATOR DESIGNATOR	**Alert Data Block** The three-letter designator (3LD) that identifies the aircraft operator. May be provided for a FGB ELT(DT) or an SGB.	
AIRCRAFT REGISTRATION	**Alert Query Report** Aircraft registration used for the alert query. Can include the 24-bit address, aircraft operator designation, and aircraft registration (or tail number).	

Term	Alert Message Section	Support Message
	Definition	
AIRCRAFT USE	**Beacon Registration Data Block Beacon Registration** The type of the aircraft on which the ELT is carried. Values for the field include (but are not limited to) Single Engine Jet, Single Engine Propeller, Helicopter, Multi Engine Jet, and Multi Engine Propeller.	
AIRPORT	**Beacon Registration Data Block Beacon Registration** Home airport (name, city, state) for the aircraft on which the ELT or PLB is carried.	
AIRPORT PRIMARY SRR	**Beacon Registration Data Block Beacon Registration** The primary SRR (RCC, MCC or SPOC) responsible for the home airport of the aircraft on which the ELT is carried.	
AIS NUMBER	**Beacon Registration Data Block Beacon Registration** AIS number for the vessel on which the EPIRB, PLB, or SSAS is carried.	
ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO	**Support Data Block** A list of all destinations that have received messages from the USMCC for this alert site. Destinations that receive an alert message based on the USMCC "echo" capability are not identified in the list.	
ALTERNATE AIRPORT	**Beacon Registration Data Block Beacon Registration** Alternate airport (name, city, state) for the aircraft on which the ELT or PLB is carried.	
ALTERNATE PORT	**Beacon Registration Data Block Beacon Registration** Alternate port (name, city, and state) for the vessel on which the EPIRB or SSAS is carried.	
ALTITUDE OF DOA POSITION	**Alert Data Block** The altitude of the DOA position in meters, as calculated by the MEOLUT. The altitude is followed by a note saying "CAUTION: NOT VALIDATED" since the reliability of the altitude is not verified as part of MEOLUT commissioning.	
ALTITUDE OF GNSS LOCATION	**Beacon Decode Data Block** The altitude of the GNSS (encoded) position, provided in meters and feet. For FGB ELT(DT)s, this is provided as a range of values, or as a single lower or upper value, and the value in feet is rounded to the nearest hundreds of feet. For SGBs, it is provided as a single value in meters, and the corresponding value in feet rounded to the nearest foot.	
AT	**Beacon Registration Data Block** Field "REGISTRATION INFORMATION AT" provides the name of the beacon registry point of contact for non-USA beacons.	

Term	Alert Message Section	Support Message
	Definition	
BEACON CONTAINS SVDR	**Beacon Registration Data Block Beacon Registration** Indicates whether the EPIRB contains a Simplified Voyage Data Recorder (S-VDR). Values are “No, “Yes,” or “Not Known.”.	
BEACON ID	**Alert Data Block Alert Query Report** **Incident Feedback Request** The unique 15-hex identifier of a 406 MHz FGB. The 15 characters represent bits 26 to 85 of a complete 406 MHz FGB message (bits 25 to 144 or bits 25 to 112), as defined in document C/S T.001. For Location protocol FGBs, bits 26 to 85 contain the Beacon ID and position information; the bits that contain position information are set to default values to provide a fixed Beacon ID in case the encoded position changes. For User protocol FGBs, bits 26 to 85 contain the Beacon ID and no position information. For SGBs, the Alert Data Block contains a unique 23-hex identifier.	
BEACON REGISTRATION ACCURACY	**Incident Feedback Request** Accuracy of beacon registration. Values are ACCURATE, INACCURATE and UNVERIFIED. Answers to be provided separately for OWNER INFORMATION, EMERGENCY CONTACT INFO and VESSEL/AIRCRAFT USAGE INFO.	
BEACON REGISTRATION DATA USED TO RESOLVE INCIDENT	**Incident Feedback Request** Indicates if beacon registration data helped resolve the incident. “PRIMARY MEANS” indicates that beacon registration data was the primary means used to resolve the incident. “CONTRIBUTED” indicates that beacon registration data contributed to incident resolution as a secondary means. “NOT USED” indicates that beacon registration data did not help resolve the incident.	
BEACON TYPE	**Beacon Decode Data Block** The beacon type decoded from the digital message by the USMCC. Valid types are provided in Table 3.3.2. Location protocol FGBs are described as standard (“(STANDARD)” or “(STD)”) or national (“(NATIONAL)”). Alerts are not normally distributed for “Spare” and “Test” protocol beacons. The beacon type for an SGB is prefixed with “SGB”.	
BUFFER	**Alert Data Block, Support Data Block** BUFFER is the second SRR in which the alert is located, based on a designated buffer to the primary SRR or an overlap of the primary SRR. If an alert is located in the primary or buffer SRR for more than three SRRs, the RCC message will only list two buffer SRRs per location, but the message will be routed to all SRRs as appropriate. See Section 3.2.3.9 for more information.	

Term	Alert Message Section	Support Message
	Definition	
BUFF_2	**Alert Data Block, Support Data Block** BUFF_2 is the third SRR in which the alert is located, based on a designated buffer to the primary SRR or an overlap of the primary SRR. If an alert is located in the primary or buffer SRR for more than three SRRs, the RCC message will only list two buffer SRRs per location, but the message will be routed to all SRRs as appropriate. See Section 3.2.3.9 for more information.	
CAPACITY	**Beacon Registration Data Block Beacon Registration** The maximum number of people on board the vessel or aircraft on which this EPIRB, SSAS beacon or ELT is carried.	
CELLULAR NUMBER	**Beacon Registration Data Block Beacon Registration** Cellular telephone number for the vessel on which the EPIRB or SSAS beacon is carried.	
CENTER POSITION	**Alert Query Report** The position (latitude and longitude) used to conduct an alert query based on a center point and radius.	
CLOSE TIME	**Incident Feedback Request** Time that the USMCC alert site was closed.	
CLOSED	**Alert Data Block** In the SIT 176 and 376 messages, field STATUS indicates if the USMCC alert site is closed or not, and if closed, the reason that the site closed. See Section 4.7 for more information.	
COLOR	**Beacon Registration Data Block Beacon Registration** The color of the vessel or aircraft on which this EPIRB, SSAS, or ELT is carried.	
CONTACTS	**Beacon Registration Data Block Beacon Registration** Emergency points of contact. Up to 4 primary (left hand column) and 4 alternate (right hand column) telephone numbers are provided. See field “TEL #”.	
COUNTRY	**Beacon Decode Data Block** The name of the country, nationality, state or territory associated with the Maritime Identification Digits (MID) code. The MID codes are assigned by the International Telecommunications Union (ITU). The C/S website (sub-links “Contact Lists” / “406 MHz Beacon Registers”) provides a list of Country/Regions for which a MID code is assigned. Table 3.2.8 lists the country/region codes for which beacon registration is maintained in the USA Beacon Registration Database.	

Term	Alert Message Section	Support Message
	Definition	
COUNTRY CODE	**Alert Query Report** The Maritime Identification Digits (MID) for the country, nationality, state or territory associated with a 406 MHz beacon, assigned by the International Telecommunications Union (ITU). A complete list is provided on the C/S web site (sub-links "System" / "List of Country/Region Codes (MID)) or in Appendix 43 of the ITU Radio Regulations. One county may have more than one country code assigned to it.	
CRAFT ID	**Beacon Decode Data Block** The decoded identifier of the vessel/aircraft on which the beacon is carried. The USMCC decodes this information from the beacon ID. The Craft ID can be a radio call sign, a MMSI number, an aircraft tail number or registration marking, an aircraft 24-bit address or an aircraft operator designator.	
CRAFT ID TYPE	**Beacon Decode Data Block** The type of vessel or aircraft information provided in field CRAFT ID for an SGB. See Section 3.3.4 for further information.	
DATE FIRST REGISTERED	**Beacon Registration Data Block** **Beacon Registration** The date that this beacon was first registered to the current owner.	
DATE LAST UPDATED	**Beacon Registration Data Block** **Beacon Registration** The date that registration information for this beacon was last updated.	
DATE REG EXPIRES	**Beacon Registration Data Block** **Beacon Registration** The date that the registration information for this beacon expires. When an owner first registers a beacon, the USMCC issues proof of beacon registration with an expiration data two years from the date of issue. When the registration information is successfully renewed, the expiration data is reset for two years from the renewal date.	
DEPLOYABLE SURVIVAL CRAFT DESCRIPTION	**Beacon Registration Data Block** **Beacon Registration** Description of the deployable survival equipment on the aircraft on which the ELT is carried.	
DETECT FREQ	**Beacon-LUT Mutual Visibility Schedule** The frequencies that can be detected by the corresponding satellite.	

Term	Alert Message Section	Support Message
	Definition	
DETECT TIME	**Alert Data Block Alert Query Report** For MEOSAR alerts, the DETECT TIME is time that a satellite last detected the beacon for the alert. For solutions with Doppler location, the TCA of the satellite to the beacon. The TCA is computed at the ground station (LEOLUT) and may differ from the detect time of the individual 406 MHz beacon bursts by 8-10 minutes; for a Doppler solution computed and sent to the MCC in near real-time, it is possible for the RCC to receive the alert message prior to the computed TCA. For non-Doppler solutions from LEOLUTs, the time that the satellite last received a burst from the 406 MHz beacon. For non-Doppler solutions from GEOLUTs, the time that the satellite first received a 406 MHz burst for the beacon; GEOLUTs report the first detect time per alert to provide the time of beacon activation more accurately when the beacon is moving rapidly (e.g., in the event of an aircraft crash). **Support Data Block Alert Query Report** For PREVIOUS MESSAGE INFORMATION, see description above for "Alert Data Block".	
DETECT TIME	**Beacon-LUT Mutual Visibility Schedule** The time of the closest approach of the LEOSAR satellite to the reported beacon location.	
DETECTION FREQUENCY	**Alert Data Block** The DETECTION FREQUENCY format is 406.nnnn MHz, and provides the detected frequency of the transmitting 406 MHz beacon to a precision of tenths of a Hz (nnnn), as shown in Table 3.2.13. It is provided for the new solution, if available, or a previous solution, if the data is not available in the new solution. The value is reported as "NOT AVAILABLE when the frequency is not available in the new or a previous solution. The frequency may be unavailable because: a) it was not provided by the reporting LUT or MCC, or b) the solution was from a LEOSAR satellite without Doppler location, in which case the reported frequency is unreliable since it includes a Doppler shift of unknown magnitude.	
DUR	**Alert Site Query** The number of hours that this beacon has been active, calculated from the earliest and most recent times that the beacon was detected.	
DURATION	**Alert Data Block** The number of hours that this beacon has been active, calculated from the earliest and latest times that the beacon was detected. This information is only provided if position was confirmed for the alert site.	

Term	Alert Message Section	Support Message
	Definition	
EAST BOUNDARY	**Alert Query Report** The eastern boundary of an alert query based on a search rectangle.	
EE	**Alert Data Block** The radius of the expected horizontal error (EHE) for the DOA position in nautical miles. The EHE should be within that radius with 95% probability with an uncertainty of +- 2%, per C/S MEOLUT requirements. The field is set to "N/A" if there is no DOA position or if the EHE is deemed to be unreliable, "000" if the value is not available for the DOA position, and "999" if the value for the DOA position is greater than 150. See Section 3.2.3.2.	
ELAPSED TIME SINCE ACTIVATION	**Beacon Decode Data Block** In hours, the elapsed time since beacon activation. Maximum value is 63 hours. Only available for SGBs.	
EMAIL	**Beacon Registration Data Block** **Beacon Registration** The email address for the beacon owner from USA beacon registry (RGDB) for USA beacon. Email address point of contact for beacon registry for non-USA beacon. Symbol "@" is represented by "(AT)" in the email address for a non-USA beacon registry.	
FACSIMILE	**Beacon Registration Data Block** Facsimile number point of contact for beacon registry for non-USA beacon.	
FIRST DETECT TIME	**Alert Data Block** **Alert Query Report** The first DETECT TIME for a MEOSAR solution. Provided only for the current MEOSAR solution; not provided for LEOSAR or GEOSAR solutions or for previously sent messages.	
FIRST TCA	**Alert Query Report** The first time that the beacon was detected based on data received by the USMCC; see "Detect Time".	
FIXED SURVIVAL CRAFT DESCRIPTION	**Beacon Registration Data Block** **Beacon Registration** Description of fixed survival equipment on the aircraft on which the ELT is carried.	
FREQ	**Alert Query Report** The frequency of a 406 MHz signal presented in MHz. Set to "406" for 406 MHz beacons.	
HOME PORT	**Beacon Registration Data Block** **Beacon Registration** Home port (name, city, and state) for the vessel on which the EPIRB, PLB, or SSAS is carried.	

Term	Alert Message Section	Support Message
	Definition	
HOME PORT PRIMARY SRR	**Beacon Registration Data Block Beacon Registration** The primary SRR (RCC, MCC or SPOC) responsible for the home port of the vessel on which the EPIRB, PLB, or SSAS is carried.	
HOMING	**Beacon Decode Data Block** The type of homing provided in this beacon. The values for FGBs include: "121.5" "MARITIME" (9 GHz Search and Rescue Radar Transponder (SART)) "OTHER" (other auxiliary radio locating device) "NIL OR NOT 121.5" (only for National, Standard, or RLS Location Protocol) and "NIL" (no auxiliary radio locating device). The values for SGBs include: "YES" (on beacon activation, homing is available, or homing is active) "NIL" (on beacon activation, homing is not available, or homing is not active) For an FGB or SGB, is UNKNOWN if the beacon message is not reliable.	
INCIDENT OUTCOME	**Incident Feedback Request** The outcome of the incident. Values are DISTRESS, NON-DISTRESS and UNDETERMINED.	
INCIDENT TYPE	**Incident Feedback Request** Type of incident. Values are AVIATION, MARITIME, TERRESTRIAL, OTHER and UNKNOWN.	
INMARSAT NUMBER	**Beacon Registration Data Block Beacon Registration** INMARSAT contact number for the vessel on which this EPIRB or SSAS is carried.	
IRIDIUM NUMBER	**Beacon Registration Data Block Beacon Registration** Iridium number for the owner of the beacon, primary contact or alternate contact.	
LAST DATA PROCESSED	**Alert Query Report** The time (in DD HHMM MON YY format where DD is day of month, HH is the hour in UTC, MM is minutes, MON is month and YY is year) when the USMCC last processed data for this site. This time differs from the last TCA, which is based on detection time at the satellite or ground station.	
LAST TCA	**Alert Query Report** The last time that the beacon was detected, based on data received by the USMCC; see "Detect Time".	

Term	Alert Message Section	Support Message
	Definition	
LATITUDE	**Alert Data Block Alert Site Query Support Data Block** The latitude position of the alert. On alert messages, provided in degrees, minutes and tenths of minute for Doppler or DOA location (computed by the LEOLUT or MEOLUT, respectively) or degrees, minutes and hundredths of minute for position encoded in the 406 MHz digital message. See the description of encoded position precision in Section 3.2.3.4.	
LEASING AGENT	**Beacon Registration Data Block Beacon Registration** The leasing agent of the aircraft on which this ELT is carried.	
LENGTH OVERALL (FT)	**Beacon Registration Data Block Beacon Registration** The length of the vessel on which the EPIRB is carried.	
LIKELY IMAGE POSITION	**Alert Data Block** When one Doppler position (A or B) in the new alert is determined to be an "image" (that is, an incorrect position), then a data line is included in the alert message about the "LIKELY IMAGE POSITION". This data line is only provided when a Doppler position is determined to be an image prior to ambiguity resolution (i.e., position confirmation). Possible values are "THE A POSITION" and "THE B POSITION". The image position is determined when a beacon was previously detected as an unlocated alert, and one of the Doppler positions was not visible to the satellite when the unlocated alert was detected, per the "LEOSAR Image Position Determination" algorithm in document C/S A.002 (Appendix B.2 to Annex B). See Section 3.2.6 for more details.	
LONGITUDE	**Alert Data Block Alert Site Query Support Data Block** The longitude position of the alert. On alert messages, provided in degrees, minutes and tenths of minute for Doppler or DOA location (computed by the LEOLUT or MEOLUT, respectively) or degrees, minutes and hundredths of minute for position encoded in the 406 MHz digital message. See the description of encoded position precision in Section 3.2.3.4.	
MANUFACTURER	**Beacon Decode Data Block** The manufacturer of the beacon as decoded from the beacon ID. This information is only available on user protocol USA serialized beacons. **Beacon Registration Data Block Beacon Registration** The manufacturer of the beacon as provided in the beacon registration.	
MESSAGE DESTINATIONS	**Alert Query Report** All destinations that have received alert messages for this site.	

Term	Alert Message Section	Support Message
	Definition	
MMSI	**Alert Query Report** The Mobile Maritime Service Identity (MMSI) used for the alert query. The MMSI consists of the three-digit country code (or MID code) and the trailing six digits of the ship station identity in accordance with Appendix 43 of ITU Radio Regulations.	
MMSI NUMBER	**Beacon Registration Data Block** **Beacon Registration** MMSI number for the vessel on which the EPIRB, PLB, or SSAS is carried.	
MODEL	**Beacon Decode Data Block** The model name of the beacon as decoded from the beacon ID. This information is only available on user protocol USA serialized beacons.	
MODEL NUMBER	**Beacon Registration Data Block** **Beacon Registration** The model name/number of the beacon as provided in the beacon registration.	
NORTH BOUNDARY	**Alert Query Report** The northern boundary of an alert query based on a search rectangle.	
NUM	**Alert Data Block** **Alert Query Report** For MEOSAR alerts, NUM is the number of detections (packets) for which data was used to generate the alert, where each beacon burst received through one antenna is counted as a detection. (E.g., if two beacon bursts are each received from two antennas, the number of detections is 4.) The field is set to "N/A" for MEOSAR alerts when no data is available. For LEOSAR and GEOSAR alerts, NUM is usually the number of detections (beacon bursts) used to generate the alert. However, for some GEOLUTs, NUM includes bursts processed with previous alerts and may be as high as "121".	
NUMBER IN DISTRESS	**Incident Feedback Request** The number of people in distress during the incident (distress cases only), excludes rescue personnel.	
NUMBER OF LIFE BOATS	**Beacon Registration Data Block** **Beacon Registration** The number of life boats on board the vessel on which the EPIRB or SSAS is carried.	
NUMBER OF LIFE RAFTS	**Beacon Registration Data Block** **Beacon Registration** The number of life rafts on board the vessel on which the EPIRB or SSAS is carried.	
NUMBER RESCUED	**Incident Feedback Request** The number of people rescued during the incident (distress cases only).	

Term	Alert Message Section	Support Message
	Definition	
OWNER	**Beacon Registration Data Block Beacon Registration** The owner of the 406 MHz beacon. This section of the message also contains the owner's mailing address, telephone numbers and email address.	
POSITION DEVICE	**Beacon Decode Data Block** The POSITION DEVICE indicates the type of device that the beacon uses to provide encoded position. Possible values are INTERNAL, EXTERNAL and NIL, as described below: INTERNAL – encoded position is provided by a device internal to the beacon EXTERNAL – encoded position is provided by a device external to the beacon NIL – no information is available. This means that the beacon type is not FGB location protocol or that the information was not reliably provided in the 406 MHz beacon message for this alert. The value is "NIL" for SGBs.	
POSITION RESOLUTION	**Beacon Decode Data Block** The POSITION RESOLUTION indicates the encoded (i.e., GNSS) position resolution. Table 3.2.7 provides the resolution of encoded position and the corresponding value in the POSITION RESOLUTION field, based on beacon protocol and the reliability of the 406 MHz beacon message. The field value is "NONE" if encoded position data is not available.	
PREVIOUS MESSAGE INFORMATION	**Support Data Block** Solution data for previous messages for the site, in descending order by time the messages were received by the USMCC. If more than 5 messages were sent for the site, only the last 5 messages sent are listed. The "PROB" (probability), "EE" (expected horizontal error), "SOL" (solution), "LATITUDE," "LONGITUDE," "DETECT TIME," "SAT" (satellite), "NUM" (number of detections) and "SOURCE" are provided, as described separately. SRR, BUFFER and BUFF_2 are only provided on messages generated before position confirmation. Section 3.5.3 further describes Previous Message Information.	
PROB	**Alert Data Block Support Data Block** The probability that the associated Doppler (A or B) position is the real position. For a Doppler solution, the position that is more likely to be real is, by definition, the "A" position. Valid ranges are 01 to 99. Section 3.2.3.1 provides more information.	
RADIO CALL SIGN	**Beacon Registration Data Block Beacon Registration** The radio call sign of the vessel on which the beacon is carried. This may be a foreign radio call sign for a foreign flagged vessel.	

Term	Alert Message Section	Support Message
	Definition	
RADIO EQP	**Beacon Registration Data Block** **Beacon Registration** The type of radio equipment on board the vessel, aircraft or person for the associated EPIRB, ELT or PLB, respectively. May include INMARSAT number, Iridium number, VHF_FM, VHF_AM, HF, MF, SSB or other value.	
RADIUS	**Alert Query Report** The radius (in kilometers) used to perform an alert query based on a center point and radius.	
REASON ACTIVATED	**Incident Feedback Request** The reason that the beacon was activated. See Annex 12 for details.	
REASON CLOSED	**Alert Query Report** The reason the alert site was closed. A site can be closed due to a period of non-detection, the period the site is open or action by the USMCC Controller.	
REGISTRATION NO	**Beacon Registration Data Block** **Beacon Registration** The Federal/State Registration number of the vessel on which the EPIRB, PLB, or SSAS is carried.	
REMAINING BATTERY CAPACITY	**Beacon Decode Data Block** The remaining battery capacity for an SGB, provided as a range of percentages.	
REMARKS	**Beacon Registration Data Block** **Beacon Registration** Additional remarks or comments provided in the beacon registration. This section may contain information on the new owner of the beacon.	
REPORT END	**Alert Query Report** Search end time of the alert query. The information is provided in DD HHMM MON YY format where DD is day of month, HH is the hour in UTC, MM is minutes, MON is month and YY is year.	
REPORT START	**Alert Query Report** Search start time of the alert query. The information is provided in DD HHMM MON YY format where DD is day of month, HH is the hour in UTC, MM is minutes, MON is month and YY is year.	
RLS PROVIDER	**Alert Data Block** Indicates which satellite constellation that provides the return link service, and is listed as GALILEO, GLONASS or UNKNOWN. Only provided when the beacon type is Return Link.	

Term	Alert Message Section	Support Message
	Definition	
SARSAT DATA USED TO RESOLVE INCIDENT	**Incident Feedback Request** Possible answers are provided below. "YES ONLY NOTIFICATION" "YES FIRST NOTIFICATION" "YES ASSISTED" "NO"	
SAT	**Alert Data Block** **Support Data Block** **Alert Query Report** The satellite that detected the beacon, identified by three characters. For MEOSAR alerts, the value is "MEO." For LEOSAR and GEOSAR alerts, the letter or letters identify the type of satellite, as described in Table 3.2.9, and the remaining digits are the satellite number. Doppler location can only be generated from beacon burst data received from COSPAS and SARSAT satellites, which are polar orbiting. On occasion, Doppler location may not be generated for beacons detected by polar orbiting satellites, because an insufficient number of usable beacon bursts were detected.	
SEARCH FREQ	**Alert Query Report** Frequency of the signal or beacon included in the search. May contain multiple frequencies. Set to "406" for 406 MHz beacons.	
SECONDARY SRR	**Beacon Registration Data Block** **Beacon Registration** The secondary SRR (RCC, MCC or SPOC) responsible for the home port of the vessel on which the EPIRB or SSAS is carried or the airport of the aircraft on which the ELT is carried	
SERIAL NUM	**Beacon Decode Data Block** The unique serial number of the beacon (serialized beacons only). For user protocol national use USA serialized FGBs, the 40 bits allocated for serial number and national use in document C/S T.001 (i.e., bits 44 – 83) are used to identify the manufacturer, model and (US defined) serial number.	
24 BIT ADDR	**Beacon Decode Data Block** For FGBs, the 24-bit aircraft address for user Protocol 24-bit Aircraft Operator and Location Protocol ELT 24-bit address ELTs. Only present on alert messages for FGB ELTs with a 24-bit address, in which case it replaces SERIAL NUM on the alert message. For FGBs and SGBs, the 24-bit address is presented as 6 hexadecimal digits and has a prefix of "HEX=".	
SHIP CALL SIGN	**Alert Query Report** The radio call sign used for the alert query. The radio call sign is an alphanumeric sequence (letters and digits) assigned to a particular vessel by the flag State administration.	

Term	Alert Message Section	Support Message
	Definition	
SITE CLOSED	**Alert Query Report** The time (in DD HHMM MON YY format where DD is day of month, HH is the hour in UTC, MM is minutes, MON is month and YY is year) when the alert site was closed by the USMCC. The alert site may be closed due to age-out time or action by the USMCC Controller.	
SITE CREATED	**Alert Query Report** The time (in DD HHMM MON YY format where DD is day of month, HH is the hour in UTC, MM is minutes, MON is month and YY is year) when the site was opened or created at the USMCC.	
SITE ID	**Alert Data Block** **Alert Query Report** **Incident Feedback Request** **Support Data Block** The USMCC assigned site identifier consisting of five numeric digits. The five-digit SITE ID is assigned sequentially, and wraps around after the maximum value 99999 is assigned; e.g., after SITE ID 99999 is assigned, the next values would be 00000 and 00001. When the IHDB is accessed, refer to the detect time to ensure that the appropriate IHDB case is being referenced for a specific SITE ID.	
SOL	**Alert Data Block** **Alert Query Report** **Support Data Block** Indicates whether the data line is associated with the “A” position (the Doppler position with the higher probability of being real), the “B” position (the Doppler position with the lower probability of being real), the “C” (confirmed or MCC Reference) position, the DOA position (computed by a MEOLUT), the “E” position (encoded in the 406 MHz beacon message). For solutions with no position, SOL is listed as “U” (unlocated).	
SOURCE	**Alert Data Block** **Alert Query Report** **Support Data Block** The ground station or LUT that ingested the satellite data. If the source is a USA LUT, then the LUT name is provided per Annex 2. If the source is not a USA LUT, then the name of the MCC associated with the LUT is provided per Annex 3.	
SOUTH BOUNDARY	**Alert Query Report** The southern boundary of an alert query based on a search rectangle.	
SPECIAL STATUS	**Beacon Registration Data Block** **Beacon Registration** Special status for beacon. Valid values are: LOST, STOLEN, SOLD, REPLACED, DESTROYED, OUTOFSERVICE and RECODED.	
SPECIAL STATUS DATE	**Beacon Registration Data Block** **Beacon Registration** The date on which the special status became effective.	
SPECIAL STATUS INFO	**Beacon Registration Data Block** **Beacon Registration** Information pertinent to the special status; see SPECIAL STATUS.	

Term	Alert Message Section	Support Message
	Definition	
SPECIFIC BEACON	**Alert Data Block** Identifies the specific beacon on a vessel or aircraft, and is present for most non-serial FGB protocols. Its value is numeric for some beacon protocols (e.g., Aviation user) and alphanumeric for other beacon protocols (e.g., Radio Call Sign user). Is not present on SGB alert messages.	
SPECIFIC USAGE	**Beacon Registration Data Block** **Beacon Registration** Information on the specific usage of the PLB.	
SRR	**Alert Data Block** **Support Data Block** The primary Search and Rescue Region associated with the given position (or beacon activation), based on information available at the USMCC. For USA RCCs the SRR is associated with a given Area of Responsibility for Coast Guard, Air Force and Joint RCCs. For foreign SRRs the position is associated with either the MCC service area or a national SAR boundary for a SAR Point of Contact (SPOC). See Section 3.2.3.9 for more information.	
STATUS	**Alert Data Block** In the SIT 176 and 376 messages, field STATUS indicates if the message was sent due to a missed detection or alert site closure. If the alert site is closed, the reason for closure is provided. See Section 4.7 for more information.	
THIS ALERT MESSAGE IS BEING SENT TO	**Support Data Block** Lists all destinations for the current alert message from the USMCC. See Section 3.5.2 for more information.	
TAIL NO	**Beacon Registration Data Block** **Beacon Registration** The tail number of the aircraft on which the ELT or PLB is carried.	
TELEX	**Beacon Registration Data Block** Telex number point of contact for beacon registry for non-USA beacon.	
TELEPHONE	**Beacon Registration Data Block** Telephone number point of contact for beacon registry for non-USA beacon.	
TEL #	**Beacon Registration Data Block** **Beacon Registration** Telephone number type and telephone number for the owner of the beacon, primary contact or alternate contact. “#” is a sequential number (1 to 4) for this telephone number. The telephone number type is (“HOME,” “WORK,” or “CELL.” For example, “TEL 1: CELL” means that the first number is a cell phone. Note: Options of “Fax” and “Other” (“OTHR”) were removed from the registration form and website in 2021.	

Term	Alert Message Section	Support Message
	Definition	
TIME OF GNSS POSITION UPDATE	**Beacon Decode Data Block** The time of GNSS position update for an SGB ELT(DT), provided in the format: DY HHMMSS MON.	
TIME SINCE GNSS LOCATION GENERATED	**Beacon Decode Data Block** The number of minutes since the GNSS location was generated for an SGB.	
TYPE	**Beacon Registration Data Block** **Beacon Registration** The type of the vessel or aircraft, respectively, on which the EPIRB, SSAS, or ELT is carried. Aircraft are categorized as general, commercial or an air carrier. Sailing vessels are categorized as sail (sloop, yawl, schooner or other) or power (fishing, tug/tow, cargo, tanker, cabin cruiser or other).	
USMCC PROCESSING TIME	**Support Data Block** The time that the USMCC processed this alert. Is usually within 1 minute of the message transmission time provided in line 1 of the message header. If the transmission time is more than 1 minute later that the USMCC Processing Time, then the message was probably retransmitted by USMCC personnel.	
VEHICLE TYPE	**Beacon Registration Data Block** **Beacon Registration** The type of the vehicle on which the PLB is carried.	
VESSEL NAME	**Beacon Registration Data Block** **Beacon Registration** The name of the vessel on which the EPIRB, PLB, or SSAS is carried.	
VISIBILITY	**Alert Query Report** **Beacon-LUT Mutual Visibility Schedule** The mutual visibility between the LEOSAR satellite, LEOLUT and beacon position.	
WEB	**Beacon Registration Data Block** The web address point of contact for beacon registry for non-USA beacon. The web address for the C/S International Beacon Registration Database (IBRD) is www.406registration.com.	
WEST BOUNDARY	**Alert Query Report** The western boundary of an alert query based on a search rectangle.	

ANNEX 2 - USA LUTs

Name on RCC Message	C/S ID	Description	Location
AK3*	3037	Alaska LEOLUT 3	Fairbanks, Alaska
AK4*	3038	Alaska LEOLUT 4	Fairbanks, Alaska
FL-MEO	3669	Florida MEOLUT	Miami, Florida
FL3*	3667	Florida LEOLUT 3	Miami, Florida
FL4*	3668	Florida LEOLUT 4	Miami, Florida
HI-MEO	3384	Hawaii MEOLUT	Wahiawa, Hawaii
HI3*	3387	Hawaii LEOLUT 3	Wahiawa, Hawaii
HI4*	3388	Hawaii LEOLUT 4	Wahiawa, Hawaii
GSE	3675	GEOLUT Support Equipment	Suitland, Maryland
GU3*	3381	Guam LEOLUT 3	Andersen AFB, Guam
GU4*	3382	Guam LEOLUT 4	Andersen AFB, Guam
LME*	3678	LEO/MEO LUT Support Equipment	Suitland, Maryland
MD-MEO	3677	Maryland MEOLUT (not planned for operational use)	Greenbelt, Maryland
MD1	3674	Maryland GEOLUT 1	Suitland, Maryland
MD2	3676	Maryland GEOLUT 2	Suitland, Maryland

**The antennas for these LUTs track a LEOSAR satellite when a LEOSAR satellite is available; otherwise, they track a MEOSAR satellite as part of the associated MEOLUT.*
The FL3,FL4, and LME antennas are associated with FL-MEO; the other antennas are associated with HI-MEO.

ANNEX 3 – COSPAS/SARSAT MCCs

The following list of COSPAS/SARSAT MCCs includes an indication of whether the MCC is LGM capable; if an MCC is not marked as "LGM" capable then it is "L/G only" capable. This list is updated each time the RCC Message Manual is published. An up-to-date list of MCCs, including information on MCC capability, is provided on the C/S website at:

https://cospas-sarsat.int/en/system/detailed-leosar-geosar-system-description/mcc-configuration

Name	Country	Associated Nodal MCC
AEMCC	United Arab Emirates	SPMCC
ALMCC*	Algeria	SPMCC
ARMCC	Argentina	USMCC
ASMCC	South Africa	AUMCC
AUMCC*	Australia	N/A
BRMCC	Brazil	USMCC
CHMCC*	Chile	USMCC
CMC*	Russia	N/A
CMCC	Canada	USMCC
CNMCC	China	JAMCC
CYMCC*	Cyprus	FMCC
FMCC**	France	N/A
GRMCC*	Greece	FMCC
HKMCC	Hong Kong	JAMCC
IDMCC	Indonesia	AUMCC
INMCC	India	CMC
ITMCC*	Italy	FMCC
JAMCC*	Japan	N/A
KOMCC	Korea	JAMCC
MYMCC	Malaysia (not operational)	AUMCC
NIMCC	Nigeria (not operational)	SPMCC
NMCC*	Norway	FMCC
PAMCC	Pakistan	CMC
PEMCC	Peru	USMCC
QAMCC*	Qatar	SPMCC
SAMCC	Saudi Arabia	SPMCC
SIMCC*	Singapore	AUMCC
SPMCC***	Spain	N/A

TAMCC*	Taiwan	JAMCC
THMCC	Thailand	AUMCC
TRMCC*	Turkey	FMCC
UKMCC*	United Kingdom	FMCC
USMCC**	United States	N/A
VNMCC	Vietnam	JAMCC

** MCC is LEOSAR/GEOSAR/MEOSAR (LGM) capable*

*** MCC is LGM, FGB ELT(DT), and SGB capable*

**** MCC is LGM and FGB ELT(DT) capable*

N/A = not applicable (nodal MCC)

ANNEX 4 - SAMPLE SIT 185 MESSAGES GENERATED BY THE CMCC

1. Alert Message Sent to USA RCC by the L/G capable CMCC

```
1.  DISTRESS COSPAS-SARSAT INITIAL ALERT
2.  MSG NO: 00061 REF No: 2DD7A0A73F81FE0
3.  DETECTED AT: 15 FEB 12 1936 28 UTC  BY SARSAT S11
4.  DETECTION FREQUENCY:  406.0368  MHz
5.  COUNTRY OF BEACON REGISTRATION:  366/ USA
6.  USER CLASS:
NATIONAL LOCATION
PLB - SERIAL NO: 213326
7.  EMERGENCY CODE:                       NIL
8.  POSITIONS:
RESOLVED  -                    NIL
DOPPLER A - 52 52.0 N 160 39.3 W  PROBABILITY 55 PERCENT
DOPPLER B - 45 41.0 N 123 11.7 W  PROBABILITY 45 PERCENT
ENCODED   -                 (DEFAULT)
9.  ENCODED POSITION PROVIDED BY: INTERNAL DEVICE
10. NEXT PASS TIMES (UTC):
RESOLVED  -                    NIL
DOPPLER A - 15 FEB 12 2048 UTC  CHURCHILL LEOLUT
DOPPLER B - 15 FEB 12 2048 UTC  CHURCHILL LEOLUT
ENCODED   -                    NIL
11. HEX ID: 2DD7A0A73F81FE0    HOMING SIGNAL   121.5
12. ACTIVATION TYPE:                      NIL
13. BEACON NUMBER ON AIRCRAFT OR VESSEL NO:
14. OTHER ENCODED INFORMATION:            NIL
15. OPERATIONAL INFORMATION:
THE A POSITION IS LIKELY TO BE AN IMAGE POSITION.
LUT ID: EDMONTON LEOLUT
16. REMARKS:                              NIL
END OF MESSAGE
```

2. Missed Pass Message Sent to USA RCC by the L/G Capable CMCC

```
1.  DISTRESS COSPAS-SARSAT MISSED DETECTION ALERT
2.  MSG NO: 00010 REF No: 2DCC442FBAFFBFF
3.  DETECTED AT: 15 FEB 12 1852 16 UTC  BY SARSAT S12
4.  DETECTION FREQUENCY:  406.0275  MHz
5.  COUNTRY OF BEACON REGISTRATION:  366/ USA
6.  USER CLASS:
STANDARD LOCATION
EPIRB - SERIAL NO: 0136 06109
7.  EMERGENCY CODE:                      NIL
8.  POSITIONS:
RESOLVED  -                   NIL
DOPPLER A - 30 41.9 N 096 56.3 W  PROBABILITY 57 PERCENT
DOPPLER B - 35 35.8 N 074 50.6 W  PROBABILITY 43 PERCENT
ENCODED   -                (DEFAULT)
9.  ENCODED POSITION PROVIDED BY: INTERNAL DEVICE
10. NEXT PASS TIMES (UTC):
RESOLVED  -                   NIL
DOPPLER A - 15 FEB 12 2047 UTC  EDMONTON LEOLUT
DOPPLER B - 15 FEB 12 1959 UTC  GOOSE BAY LEOLUT
ENCODED   -                   NIL
11. HEX ID: 2DCC442FBAFFBFF    HOMING SIGNAL   121.5 MHZ
12. ACTIVATION TYPE:                     NIL
13. BEACON NUMBER ON AIRCRAFT OR VESSEL NO:
14. OTHER ENCODED INFORMATION:
MISSED BEACON DETECTION : 2DCC442FBAFFBFF
CSTA CERTIFICATE NO: 0136
15. OPERATIONAL INFORMATION:
RELIABILITY OF DOPPLER - SUSPECT : WF > 2
LUT ID: CHURCHILL LEOLUT
16. REMARKS:                             NIL
END OF MESSAGE
```

ANNEX 5 - BEACON REGISTRATION DATA BLOCK FORMATS

The format for registration data varies based on the beacon type. Sample registration information for an ELT, an EPIRB, and a PLB are presented in this annex.

ELT Beacon Registration Data Block Format

```
**** BEACON REGISTRATION DATABASE INFORMATION ****

OWNER: JOHNSON AIRLINE
       1235 AIRPORT AVENUE            TEL 1: WORK 6141234567
       COLUMBUS                OH     TEL 2:
       43218     USA                  TEL 3:
                                      TEL 4:
       EMAIL:

CONTACTS: SAM SMITH
     TEL 1: WORK 8001234321           TEL 1:
     TEL 2:                           TEL 2:
     TEL 3:                           TEL 3:
     TEL 4:                           TEL 4:

LEASING AGENT:

AIRCRAFT MANUFACTURER/MODEL: CESSNA CITATION      / 750 CITATION X
AIRCRAFT USE: (NO DATA PROVIDED)      COLOR: WHITE/MAROON STRIPES
RADIO EQP: VHF,HF                     CAPACITY:    10
TAIL NO: N999AB

FIXED SURVIVAL CRAFT DESCRIPTION:

DEPLOYABLE SURVIVAL CRAFT DESCRIPTION:


AIRPORT PRIMARY SRR: AFRCC            SECONDARY SRR:
AIRPORT: KCMH                         COLUMBUS                    OH

MANUFACTURER: IESM                    MODEL NUMBER: 406

DATE FIRST REGISTERED: 11 APR 2003    DATE REG EXPIRES: 27 AUG 2011
DATE LAST UPDATED:  27 AUG 2009

REMARKS:



SPECIAL STATUS:                       SPECIAL STATUS DATE:
SPECIAL STATUS INFO:
```

EPIRB Beacon Registration Data Block Format

```
**** BEACON REGISTRATION DATABASE INFORMATION ****

OWNER: GULF SHRIMP PRODUCERS INC
       1234 SECOND AVENUE             TEL 1: HOME 813-934-1111
       TARPON SPRINGS          FL     TEL 2: WORK 813-934-5678
       34689     USA                  TEL 3: CELL 813-934-1234
                                      TEL 4: WORK 813-934-4444
       EMAIL: GULFSHRIMP@AOL.COM

CONTACTS: ROY JONES                   NANCY JONES
        TEL 1: HOME 813-937-3333      TEL 1: HOME 904-827-1234
        TEL 2: WORK 813-934-2222      TEL 2: CELL 904-829-9999
        TEL 3: CELL 813-934-1111      TEL 3:
        TEL 4:                        TEL 4:

VESSEL NAME: PROUD MARY
TYPE: POWER TRAWLER                   LENGTH OVERALL (FT):    75
COLOR: BLUE                           CAPACITY:   9
RADIO CALL SIGN: WAQ1234              REGISTRATION NO: 654321
RADIO EQP: VHF-FM, INMARSAT           INMARSAT NUMBER:
CELLULAR NUMBER:                      IRIDIUM NUMBER: 8811234567890
MMSI NUMBER: 303940000                AIS NUMBER: 974320123

NUMBER OF LIFE BOATS:     0           NUMBER OF LIFE RAFTS:     1

HOME PORT PRIMARY SRR: LANTAREA       SECONDARY SRR:
HOME PORT: RICK'S MARINA              SHALLOTTE               NC

MANUFACTURER: LITTON                  MODEL NUMBER: 948-01
ACTIVATION TYPE: CAT1 (MANUAL AND AUTOMATIC)

BEACON CONTAINS SVDR:  NO

DATE FIRST REGISTERED: 26 JUN 1999    DATE REG EXPIRES: 31 DEC 2010
DATE LAST UPDATED:  11 JAN 2009

REMARKS:

SPECIAL STATUS:                       SPECIAL STATUS DATE:
SPECIAL STATUS INFO:
```

PLB Beacon Registration Data Block Format

```
**** BEACON REGISTRATION DATABASE INFORMATION ****

OWNER: HAWKEYE PIERCE
       RFD 1 BOX 1111                 TEL 1: CELL 2342222222
       CRABAPPLE COVE          ME     TEL 2: HOME 2071111111
       04682     USA                  TEL 3: WORK 2223333333
                                      TEL 4:
       EMAIL: PIERCE.HAWKEYE@AOL.COM

CONTACTS: MILDRED PIERCE              BILLY BRAY JR
     TEL 1: HOME 2071234567           TEL 1: HOME 2071234567
     TEL 2: WORK 2078765432           TEL 2: CELL 3015555555
     TEL 3: CELL 3014444444           TEL 3:
     TEL 4: CELL 2121111111           TEL 4:

RADIO CALL SIGN: WAQ4567              REGISTRATION NO:
RADIO EQP: VHF-FM
MMSI NUMBER:                          AIS NUMBER:

VEHICLE TYPE: LAND VEHICLE
SPECIFIC USAGE: HUNTING
HOME PORT:
AIRPORT:
TAIL NO:

MANUFACTURER: MPR/ALDEN               MODEL NUMBER: 406S1010

DATE FIRST REGISTERED: 13 NOV 1999    DATE REG EXPIRES: 02 OCT 2009
DATE LAST UPDATED:  02 OCT 2007

REMARKS:



SPECIAL STATUS:                       SPECIAL STATUS DATE:
SPECIAL STATUS INFO:
```

ANNEX 6 - INCIDENT HISTORY FEEDBACK REQUEST

```
**** INCIDENT FEEDBACK REPORT. SEND REPORT TO USMCC: ****
** 301-817-4568 (FAX), USMCC@NOAA.GOV (EMAIL) OR KZDCZSZA (AFTN) **

BEACON ID: DB476 E2E28 D35C1    SITE ID: 46222    CLOSE TIME: 17 1526 JAN

ACTUAL LOCATION  LAT:         LONG:

INCIDENT OUTCOME:
 DISTRESS / NON-DISTRESS / UNDETERMINED

INCIDENT TYPE:
 AVIATION / MARITIME / TERRESTRIAL / OTHER / UNKNOWN

BEACON REGISTRATION USED TO RESOLVE INCIDENT:
 PRIMARY MEANS / CONTRIBUTED / NOT USED

BEACON REGISTRATION ACCURACY -
 OWNER INFORMATION:          ACCURATE / INACCURATE / UNVERIFIED

 EMERGENCY CONTACT INFO:     ACCURATE / INACCURATE / UNVERIFIED

 VESSEL/AIRCRAFT USAGE INFO: ACCURATE / INACCURATE / UNVERIFIED

SARSAT DATA USED TO RESOLVE INCIDENT:
 YES ONLY NOTIFICATION / YES FIRST NOTIFICATION / YES ASSISTED / NO

NUMBER RESCUED:        NUMBER IN DISTRESS:

REASON ACTIVATED (SELECT ONE):
 DISTRESS: AUTOMATIC / MANUAL / ACTIVATION METHOD UNKNOWN

 FALSE ALERT (SEE CATEGORIES BELOW) -
  BEACON MISHANDLING: INSTALLATION /TEST-MAINTENANCE /USAGE /DISPOSAL

  BEACON MALFUNCTION: SWITCH /WATER INTRUSION /SELF-TEST /ELECTRONICS

  BEACON MOUNTING:  BRACKET FAILURE / HYDROSTATIC RELEASE / MAGNET

  OTHER FALSE ALERT: ENVIRONMENTAL CONDITIONS / REASON UNKNOWN

 UNKNOWN-INCONCLUSIVE

ACTIVATION COMMENT:
```

ANNEX 7 - SRR NAMES AND DESTINATION CODES FOR RCCs AND SPOCs ON RCC ALERT MESSAGES FROM THE USMCC

RCC	SRR Name	Destination Code	Echoed SRR[5]
US Air Force RCC	AFRCC	366S	
US Alaska RCC	AKRCC	366A	
US Coast Guard District 1	CGD01	366B	
US Coast Guard District 5	CGD05	366N	
US Coast Guard District 7	CGD07	366M	
US Coast Guard District 8	CGD08	366O	
US Coast Guard District 9	CGD09	366C	
US Coast Guard District 13	CGD13	366E	
US Coast Guard District 14	CGD14	366H	
US Coast Guard District 17	CGD17	366J	
US Coast Guard Atlantic Area	LANTAREA	CGOP	
US Coast Guard Sector Guam	MARSEC	366G	
US Coast Guard Pacific Area	PACAREA	366F	
US Coast Guard Sector San Juan	SANJN	366U	
US Coast Guard Test Site	*C2CEN*[3]	C2CN	
Canada RCC Halifax[1]	HALIFAX	316H	
Canada RCC Quebec City[1]	QUEBECCITY	316Q	HALIFAX
Canada RCC Trenton[1]	TRENTON	316T	
Canada RCC Victoria[1]	VICTORIA	316V	
ICAO Location of Aircraft in Distress Repository	ICAOLADR	LADR	
SPOC			
Bermuda[4]	BERMUDASP	3100	
COCESNA (Spanish for Central American Corporation for Navigation Area Services)	COCESNA	CNAM	
Colombia	COLMSP	7300	
Dominican Republic[4]	DOMREPSP	3270	SANJN
Ecuador	ECSP	7350	
Guyana	GUYSP	7500	
Haiti	HAITISP	3360	CGD07
Mexico (Mexican Navy)	MEXISP	3450	MEXTEL
Mexico Telecommunications (Mex. Air Force)	MEXTEL	3451	MEXISP
Netherlands Antilles	NANTSP	3060	SANJN
Panama	PANSP	3520	
Trinidad and Tobago	TTSP	3620	SANJN
Venezuela	VZMCC	7750	
Bolivia[2]	BOLSP	7200	
Chile RCC[2]	ChileRCC	7251	
Paraguay[2]	PARSP	7550	
Uruguay[2]	URSP	7770	

[1] The USMCC distributes alerts to Canada RCCs when the USMCC backs up the CMCC. When the USMCC backs up the CMCC, alert messages for locations in the Canadian SRR contain the SRR name of the associated Canadian RCC.

[2] The USMCC distributes alerts to these SPOCs when it backs up the CHMCC. Otherwise, the CHMCC distributes alerts to these SPOCs. During backup of the CHMCC, alerts for the Chile SRR are sent to Chile RCC with CHMCC listed as the associated message destination.

[3] The USMCC copies alerts sent to US CG RCCs to Test Site "C3CEN," termed "C2CEN" in USMCC configuration.

[4] This SPOC is sent RCC formatted messages.

[5] The echoed SRR destination is not displayed in the Supporting Information section of the RCC message. See also Annex 14.

ANNEX 8 - SAMPLE ALERT MESSAGE FOR A USA NAVAL SUBMARINE PROGRAM BEACON (SEPIRB)

Alert messages sent for USA Naval Submarine Program Beacons (SEPIRBs) contain a special header (starting with **“**SUBMARINE DISTRESS ALERT”), as shown in the following sample message. The BEACON TYPE is NATIONAL USER, which means that the beacon type cannot be identified as EPIRB, ELT or PLB directly from the beacon message, and that portions of the beacon message are coded per national specifications and thus cannot be decoded per C/S beacon coding standards. Beacon Registration Database Information is shown for a PLB because the PROGRAM BLOCK REGISTRATION ID (actual value not shown) is coded as a PLB. Some fields that are program specific are shown with a value of “X”s, not an actual value.

```
/31419 31418/3660/15 340 2335
/173/NCSP

       SUBMARINE DISTRESS ALERT MESSAGE - IMMEDIATE ACTION REQUIRED
       U.S. SUBMARINE DISTRESS ALERT MESSAGE FROM NOAA MCC FOLLOWS

       THIS ALERT SENT TO NAVSUBCMD, PACAREA, LANTAREA IN ADDITION
       TO THE DESTINATIONS LISTED IN SUPPORTING INFORMATION BELOW

**** 406 BEACON POSITION CONFLICT ****

BEACON ID: XXXXX XXXXX XXXXX      SITE ID: 18496

**** POSITION DIFFERENCES OF MORE THAN 20 KMS EXIST FOR THIS BEACON ****
**** DETECTION TIME AND POSITIONS FOR THE BEACON ****

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
51   N/A A  39 42.4N  137 56.6E  05 223644 DEC S12 008 PEMCC  JAMCC
49   N/A B  32 27.1N  113 52.4E  05 223644 DEC S12 008 PEMCC  CNMCC
N/A  N/A E  41 31.97N 071 18.67W 05 223644 DEC S12 003 PEMCC  AFRCC /CGD01

DETECTION FREQUENCY: 406.0245 MHZ
HIGH PROBABILITY THAT THE NEW DOPPLER POSITION DATA IS ACCURATE WITHIN 5 KM

**** BEACON ID CONTAINS THE FOLLOWING ENCODED INFORMATION ****

COUNTRY     : USA             BEACON TYPE: NATIONAL USER
COUNTRY CODE: 366             CRAFT ID   :                SPECIFIC BEACON:
MANUFACTURER:                 MODEL      :
SERIAL NUM  : N/A             HOMING     : NIL
POSITION DEVICE: INTERNAL     POSITION RESOLUTION: 2 SECONDS

PROGRAM: NAVAL SUBMARINE      PROGRAM BLOCK REGISTRATION ID: XXXXXXXXXXXXXXX
SEPIRB ID :   40
MINUTES FOR GPS LOC:    2     HOURS ACTIVE:    0

 6 IHDB record(s) found, most recent: 2020-12-25.
```

```
**** BEACON REGISTRATION DATABASE INFORMATION ****

OWNER: XXXXXXXXXXXXXX
  XXXXX                          TEL 1: OTHR (no data provided)
  XX                             TEL 2:
  XXXXX     XXX                  TEL 3:
                                 TEL 4:
  EMAIL:

CONTACTS: XX1                          XX2
  TEL 1: WORK XXXXXXXXXX           TEL 1: WORK XXXXXXXXXX
  TEL 2:                           TEL 2:
  TEL 3:                           TEL 3:
  TEL 4:                           TEL 4:

RADIO CALL SIGN:                    REGISTRATION NO:
RADIO EQP:
MMSI NUMBER:                        AIS NUMBER:
HOME PORT:
AIRPORT:
TAIL NO:

VEHICLE TYPE: SUBMARINE
SPECIFIC USAGE: SUBMARINE

MANUFACTURER: MCMURDO (USCG)          MODEL NUMBER: NO DATA PROVIDED

DATE FIRST REGISTERED: 18 JUL 2002    DATE REG EXPIRES: 28 OCT 2005
DATE LAST UPDATED: 28 OCT 2003

REMARKS: THIS IS PART OF A GROUP REGISTRATION XXXXXXXXX




SPECIAL STATUS:                     SPECIAL STATUS DATE:
SPECIAL STATUS INFO:

**** SUPPORTING INFORMATION ****

USMCC PROCESSING TIME: 05 2306 DEC

THIS ALERT MESSAGE IS BEING SENT TO:
  NAVSUBLANT,NAVSUBPAC

ALERT MESSAGES FOR THIS SIGNAL PREVIOUSLY SENT TO:
  NAVSUBLANT,NAVSUBPAC

PREVIOUS MESSAGE INFORMATION:

PROB EE SOL LATITUDE  LONGITUDE  DETECT TIME   SAT NUM SOURCE SRR   /BUFFER/BUFF_2
N/A  065 D  39 02.4N  137 44.6E  05 223621 DEC MEO 003 TRMCC  JAMCC

QQQQ
/LASSIT
/ENDMSG
```

ANNEX 9 - NATIONALLY DEFINED ALERT MESSAGES DESIGNED FOR AUTOMATED PROCESSING

These messages contain 9 lines, as described in Table 9.1. Field separators are "/" or " " (blank), as shown in the Character Representation for each data line. Table 9.2 describes the Message Type (per Line 2, Field 1 in Table 9.1). Doppler positions are computed by LUTs using LEOSAR satellite data. DOA positions are computed by LUTs using MEOSAR satellite data.

Table 9.1: Field Descriptions for Nationally Defined Alert Messages Designed for Automated Processing

Line	Field	Field Description	Character Representation
1		**Message Header (Line 1).** Matches line 1 of Message Header as described in Section 3.1.	**/nnnnn nnnnn/3660/yy jjj hhmmss**
1	1	Current Message Number for Destination	Nnnnn
1	2	Original Message Number - 0 if first attempt	Nnnnn
1	3	Source (USMCC) ID	3660
1	4	Message Transmission Time: Year, Julian Day, Hour, Minute, Second	yy jjj hhmmss (spaces separate Year from Julian Day and Julian Day from time)
2		**Message Header (Line 2)**	**/nnna/aaaa**
2	1	Message Type ID	nnna (nnn=SIT number per Table 2.1. "a" is the message sub-type per Table 9.2 below.)
2	2	Destination ID	Aaaa
3		**Identification Data (Line 3)**	**/xxxxxxxxxxxxxxx/aaaaaaa/nnnnnn/a /a (length 21)/aaaaaaaaaaaaaaaaaaaaa**
3	1	Beacon ID. See Section 3.2.1.1.	xxxxxxxxxxxxxxx
3	2	HHR ID (if HHR ID present, is numeric, up to 7 digits, right padded with blanks as needed; is only set for CSEL beacons, set to "NA " if non-CSEL). See Section 3.3.3.2.	nnnnnnn
3	3	USMCC Alert Site ID. Last 5 digits match Alert Site ID per Section 3.2.1.2.	nnnnnn
3	4	Beacon ID is reliable ("Y"=Yes, "N"=no. If "N," neither HHR ID or Special Program Name are set). See Section 2.1.4.	A
3	5	Special Program Name (per USMCC processing), "NA" (space filled to length 21) if no information. See Section 3.3.2.	aaaaaaaaaaaaaaaaaaaa (length 21)
3	6	Beacon Type. "Unknown" if "Beacon ID is Reliable" = "N". See Table 3.3.2.	aaaaaaaaaaaaaaaaaaaaaaa (length 24)
4		**New Alert Data (Line 4)**	**/yy jjj hhmmss/ann/nnnn**
4	1	Detection Time (MEOSAR: is last data time for new solution)	yy jjj hhmmss

Line	Field	Field Description	Character Representation
4	2	Associated Satellite. See Section 3.2.3.5.	Ann (LEOSAR, GEOSAR) *or "W00" (MEOSAR)*
4	3	Associated LUT / Ground Station. The first three digits correspond to the code for the associated country.	nnnn
5		**Encoded Position (Line 5)**	**/$nn.nnnn/$nnn.nnnn/9999.99/yy jjj hhmmss/a**
5	1	Encoded Position Latitude - ("szz.zzzz" = default when no data is available)	$nn.nnnn
5	2	Encoded Position Longitude - ("szzz.zzzz" = default when no data is available)	$nnn.nnnn
5	3	Encoded Position Uncertainty Estimate (9999.99 = no information)	9999.99
5	4	Encoded Position Detection Time (same as Time on Line 4; "zz zzz zzzzzz" = no data is available)	yy jjj hhmmss
5	5	Encoded Position Quality Indicator ("R" = refined, "C"= coarse, "G" = gross, "Z"= no data is available). See Section 3.2.3.4	A
6		**Doppler "A" *or MEOSAR DOA* Position (Line 6)**	**/$nn.nnnn/$nnn.nnnn/nnnn.nn/yy jjj hhmmss/nn**
6	1	Doppler "A" / DOA Position Latitude - ("szz.zzzz" = default when no data is available)	$nn.nnnn
6	2	Doppler "A" / DOA Position Longitude - ("szzz.zzzz" = default when no data is available)	$nnn.nnnn
6	3	Doppler "A" / DOA Position Uncertainty Estimate (expected error of DOA position in km, if available; "0000.00" if Doppler position outside satellite footprint; "0000.01" if Doppler position within satellite footprint; "9999.99" = no information)	nnnn.nn
6	4	Doppler "A" / DOA Position Detection Time (same as Time on Line 4; "zz zzz zzzzzz" = no data is available)	yy jjj hhmmss
6	5	Doppler "A" / DOA Position Probability (50 - 99; "00" = DOA position outside satellite footprint' "01" = DOA position within satellite footprint; "zz" = no data is available)	Nn
7		**Doppler "B" Position (Line 7)**	**/$nn.nnnn/$nnn.nnnn/nnnn.nn/yy jjj hhmmss/nn**

Line	Field	Field Description	Character Representation
7	1	Doppler "B" Position Latitude - ("szz.zzzz" = default when no data is available)	$nn.nnnn
7	2	Doppler "B" Position Longitude - ("szzz.zzzz" = default when no data is available)	$nnn.nnnn
7	3	Doppler "B" Position Uncertainty Estimate (“0000.00” if Doppler position outside satellite footprint; “0000.01” if Doppler position within satellite footprint; “9999.99” = no information)	nnnn.nn
7	4	Doppler "B" Position Detection Time (same as Time on Line 4; "zz zzz zzzzzz" = no data is available)	yy jjj hhmmss
7	5	Doppler "B" Position Probability (01 - 50; "zz' = no data is available)	Nn
8		**Resolved Position (Line 8)**	**/$nn.nnnn/$nnn.nnnn/9999.99/yy jjj hhmmss**
8	1	Resolved Position Latitude - ("szz.zzzz" = default when no data is available)	$nn.nnnn
8	2	Resolved Position Longitude - ("szzz.zzzz" = default when no data is available)	$nnn.nnnn
8	3	Resolved Position Uncertainty Estimate (9999.99= no information)	9999.99
8	4	Resolved Position Detection Time (same as Time on Line 4; "zz zzz zzzzzz" = no data is available)	yy jjj hhmmss
9		**End of message identifier (Line 9)**	**/ENDMSG**
		Character	**Definition**
		n	Numeric character, 0-9
		a	Alphanumeric character, Aa-Zz, 0-9
		$	"+ " or "-"
		x	Hexadecimal character, A-F, 0-9
		yy	Year, 00 - 99
		jjj	Julian day, 001 - 366
		hh	Hour, 00 - 23
		mm	Minute, 00 - 59
		ss	Seconds, 00 - 59
		szz.zzzz	Default for latitude when data is not available
		szzz.zzzz	Default for longitude when data is not available

Table 9.2: Descriptions for Nationally Defined Alert Messages Designed for Automated Processing

Message (SIT) Number	Message Number Subtype	Alert Message Description
160	P	Unlocated First Alert
161	E	First Alert Doppler Position, position unconfirmed (includes Image Determination, which may occur in a subsequent Doppler Position alert)
161	M	First Alert DOA Position, position unconfirmed
161	P	First Alert Encoded Position, position unconfirmed
162	E	Doppler Position Update, position unconfirmed
162	L	Unresolved Doppler Position Match, position unconfirmed
162	M	DOA Position Update, position unconfirmed
163	E	Doppler Position Conflict, position unconfirmed
163	M	DOA Position Conflict, position unconfirmed
163	P	Encoded Position Conflict, position unconfirmed, no Doppler or DOA Position
164	E	Position Confirmation with Doppler Position
164	M	Position Confirmation with DOA Position
164	P	Position Confirmation with Encoded Position, no Doppler or DOA Position
165	A	Doppler Position Conflict, position confirmed
165	F	Encoded Position Conflict, position confirmed, no Doppler or DOA Position
165	E	Doppler Position Update to Composite (position confirmed)
165	B	DOA Position Conflict, position confirmed
165	M	DOA Position Update to Composite (confirmed) Position
165	P	Encoded Update to Composite (confirmed) Position, no Doppler or DOA Position
167	P	Updated Unlocated Alert
168	E	NOCR, Doppler Position
168	M	NOCR, DOA Position
168	P	NOCR, Encoded Position, no Doppler or DOA Position
169	F	Encoded Position (or Rotating Field*) Update, position confirmed, no Doppler or DOA Position
169	E	Encoded Position (or Cancellation or Rotating Field)* Update, position unconfirmed, Doppler Position
169	M	Encoded Position (or Cancellation or Rotating Field*) Update, DOA Position
169	P	Encoded Position (or Cancellation or Rotating Field*) Update, position unconfirmed, no Doppler or DOA Position
169	V	Encoded Position (or Cancellation or Rotating Field*) Update, position confirmed, Doppler Position

***** *SGBs and ELT(DT)s, may contain user cancellation or rotating fields in the beacon message.*

Sample Nationally Defined Alert Messages Designed for Automated Processing

```
/00030 00021/3660/13 345 194431
/164E/XXXX
/2DD79DB3BF81FE0/NA     /143801/Y/USAF_648Aeronautical_/PLB SERIAL (NATIONAL)
/13 344 192038/S12/3673
/+43.0456/-115.8678/9999.99/13 344 192038/R
/+43.0431/-115.8753/9999.99/13 344 192038/64
/+51.5094/-071.4631/9999.99/13 344 192038/36
/+43.0453/-115.8688/9999.99/13 344 192038
/LASSIT
/ENDMSG
```

ANNEX 10 - OTHER ALERT MESSAGES DESIGNED FOR AUTOMATED PROCESSING (SARMaster)

When the USMCC backs up the CMCC, the USMCC is capable of sending alert messages to Canadian RCCs in SARMaster format, a vendor (EMS/Honeywell) defined format that allows (SARMaster) software at an RCC to process alert data received from an MCC. The SARMaster format is based on the SIT message format used by C/S MCCs to exchange alert data (per document C/S A.002), with additional fields and some modified fields included in SIT messages. The USMCC currently sends alerts for Canadian RCCs in SIT 185 message format, described in Section 6 and document C/S A.002.

The SARMaster format is described in Section 12.0 of the "SARMaster System Manager User Guide," maintained by EMS/Honeywell for the CMCC (as provided by the CMCC to the USMCC per Annex 11). Messages sent by the USMCC to Canadian RCCs are quite similar in format and content to the messages sent by the CMCC to Canadian RCCs (and described in the SARMaster User Guide), but not identical. In some cases, fields described in the SARMaster User Guide are not available at the USMCC. Key details on messages sent by the USMCC to Canadian RCCs are provided below.

SARMaster formatted messages are based on corresponding C/S SIT alert messages, per Table 10.1. All SARMaster SIT alert messages are in one of two formats, one for messages with Doppler or DOA location and another for messages without Doppler or DOA position. Thus MEOSAR data is fit into the formats designed for LEOSAR/GEOSAR data, where the DOA solution data is put into fields designed for Doppler "A" solution data. The LGM capable USMCC does not provide next pass information for USA LEOLUTs in alert messages. The data time (C/S message field 14) is set to the time of the last burst.

The USMCC distributes some additional alerts in SARMaster format, relative to C/S data distribution procedures, in accordance with procedures used by the USMCC to distribute alerts to USA RCCs; for example:

a) an updated Doppler alert (SIT 175) is sent prior to ambiguity when the "A" side probability increases by at least 15% in a new, same pass Doppler alert; and
b) an updated unlocated alert (SIT 172) is sent when a new unlocated alert is received with a detect time at least 30 minutes after the most recent detect time on a previously sent alert.

Table 10.1: Corresponding SIT Numbers for SARMaster and C/S Alert Messages

SARMaster SIT No.	C/S SIT Number		Description
	L/G	MEO	
172	122	142	Incident (No Doppler/DOA)
173	123	143	Position conflict (No Doppler/DOA)
174	124	144	Position Confirmation (No Doppler/DOA)
175	125	145	Incident (Doppler/DOA)
176	126	146	Position conflict (Doppler/DOA)
177	127	147	Ambiguity resolution (Doppler/DOA)
182	132	136	Notification of country of registration (encoded only)
183	133	137	Notification of country of registration (Doppler/DOA)

Explanatory notes are provided below. As described in document C/S A.002, a slash (/) precedes each SIT message field on each message line; for example, field "3" is the data that follows the third slash in the associated message line, and continues up to the next slash or the end of the message line.

In all messages, the Send Time (Line 1, field 3) contains the time per C/S SIT message field 3 (in format yy jjj hhmm, where yy is year, jjj is the Julian day, hh is hour of the day, and mm is minutes of the hour) with ".00" (seconds of the minute) added to the end of the field to match the SARMaster format. Relative to C/S alert messages, alert messages sent by the CMCC to Canadian RCCs contain an extra line with the value "/0000/" just prior to the line that contains "/LASSIT". This extra line is not defined in the SARMaster User Guide noted above and is not contained in messages sent by the USMCC to Canadian RCCs.

C/S data fields in lines 2, 3 and 4 (designed for LEOSAR/GEOSAR alerts) are set specially for MEOSAR alerts as shown in Table 10.2.

Table 10.2: Fields Set Specially in Lines 2, 3 and 4 for MEOSAR Alerts of SARMaster Format as Generated by the USMCC

Line #. Field #	C/S Msg Field*	Format	Description
2.3	06	nnn	Set to "300". Satellite Identifier.
3.6	21**	nn	**No DOA only.** Number of Packets per C/S message field 88. If value = 01 for the first alert for an alert site, then the MEOSAR alert may be uncorroborated.
3.2.a	12.a	c	**DOA only.** Set to "+". Global Data Flag
3.2.b	12.b	c	**DOA only.** Set to "8". Frequency Band
3.5	15	n	**DOA only.** DOA position in satellite footprint (0=Yes, 8=Unknown, 9=No); corresponding C/S field contains TCA Window Flag.

Line #. Field #	C/S Msg Field*	Format	Description
4.1	16	n	**DOA only.** Set to "0". Number of Iterations
4.2	17	nn.nnn	**DOA only.** Set to "00.000". CTA
4.3	18	nnnn	**DOA only.** Expected Horizontal Error (nm) rounded up, 0000= not available, 0999= more than 150 nms.

**C/S Message field number for LEOSAR/GEOSAR alert data*

***C/S Message field 21 contains number of points.*

Lines 6 and 7 of "no Doppler /DOA alerts" (e.g., SIT 173) and Doppler /DOA alerts (e.g., SIT 177) contain the information shown in Table 10.3. These lines are not included in corresponding C/S SIT messages.

Table 10.3: Lines 6 and 7 in SARMaster Format Alerts as Generated by the USMCC

Line #. Field #	Format	Description
6.1	nnnnn	Trailing 5 digits of USMCC Site Number. In SARMaster format, this field is defined as field "1B" (original message number sent by the OCC to the RCC for this beacon).
6.2	nn	Set to "00". Defined as the number of satellite passes.
6.3	nn	Set to "00". Defined in SARMaster format as field 671 (number of solutions).
6.4	c	Set to ' ' (blank). Defined in SARMaster format as field 674 for Doppler alerts, not defined for alerts with no Doppler position.
6.5	nnn.nnn	Alert site duration in hours. Defined in SARMaster format as field 668.
6.6	nnnn	Set to '0000'. Defined in SARMaster format as field 666.
6.7	nnnn	Set to '0000'. Defined in SARMaster format as field 667.
6.8	xx….xx	15-Hexadecimal beacon ID, per C/S message field 22.
6.9	cc….cc	Name of Country encoded in beacon ID. Set to "BEACON MESSAGE IS NOT RELIABLE" if the beacon message is not reliable. Defined in SARMaster format as field 665.
7.1	xx….xx	15-Hexadecimal beacon ID, per C/S message field 22.
7.2	snn.nnn	Encoded position latitude, where "s" is the sign ('+' or '-'). The field is only present if the beacon message contains encoded position.
7.3	snnn.nnn	Encoded position longitude, where "s" is the sign ('+' or '-'). The field is only present if the beacon message contains encoded position.

Lines 8 and 10 of Doppler /DOA alerts (e.g., SIT 175) are included in corresponding C/S SIT messages, but some fields are set differently by the USMCC, as described in Table 10.4.

Table 10.4: Lines 8 and 10 in SARMaster Format Alerts as Generated by the USMCC

Line #. Field #	Format	Description
8.1	fnnn	Sub-field "f," "position flag 1: '+' in position flags 1 and 2 (position not confirmed), '+' in position flag 1 and '-' in position flag 2 (new Doppler/DOA position matches the MCC Reference Position), or '-' in position flags 1 and 2 (Doppler/DOA position conflict, position confirmed). Sub-field "nnn": SAR Code for associated location or alert site. Corresponds to C/S message field 24.
8.2	snn.nnn	Latitude of "A" /DOA location (if position not confirmed or position conflict alert) or confirmed location (if position confirmed and a new Doppler /DOA position matches the MCC Reference Position). Corresponds to C/S message field 25.
8.3	snnn.nnn	Longitude of "A" /DOA location (if position not confirmed or position conflict alert) or confirmed location (if position confirmed and a new Doppler /DOA position matches the MCC Reference Position). Corresponds to C/S message field 26.
8.5	nn	Probability of "A" location (if Doppler position not confirmed or Doppler position conflict alert) or '99' (if position confirmed and a new Doppler position matches the MCC Reference Position). Set to "00" for DOA position. Corresponds to C/S message field 28.
8.6	yy jjj hhmm	Time of next LEOSAR pass scheduled for "A" location (if position not confirmed) or MCC Reference Position (if position confirmed). Set to "00 000 0000" for MEOSAR alerts. Not provided for USA LEOLUTs. Corresponds to C/S message field 29.
8.7	n	Confidence factor for "A" location (if Doppler position not confirmed or Doppler position conflict alert) or new Doppler location matching MCC Reference Position (if position confirmed and a new Doppler position matches the MCC Reference Position), per C/S message field 29. Set to "0" for DOA position.
8.8.a	nnn.n	"A" location data residual standard deviation (if Doppler position not confirmed or Doppler position conflict alert) or new Doppler location matching MCC Reference Position (if position confirmed and a new Doppler position matches the MCC Reference Position), per C/S message field 30. Set to "000.0" for DOA position.
8.8.b	nnn.n	"A" location data residual trend (if Doppler position not confirmed or Doppler position conflict alert) or new Doppler location matching MCC Reference Position (if position confirmed and a new Doppler position matches the MCC Reference Position), per C/S message field 30. Set to "000.0" for DOA position.

Line #. Field #	Format	Description
10.1	fnnn	Sub-field "f," position flag 2: '+' in position flags 1 and 2 (position not confirmed), '+' in position flag 1 and '-' in position flag 2 (new Doppler /DOA position matches the MCC Reference Position), or '-' in position flags 1 and 2 (Doppler /DOA position conflict, position confirmed). Sub-field "nnn": SAR Code for associated location or alert site. Corresponds to C/S message field 24.
10.2	snn.nnn	Latitude of "B" location (if position not confirmed or position conflict alert) or new Doppler /DOA location matching MCC Reference Position (if position confirmed and a new Doppler position matches the MCC Reference Position). Set to "+00.000" if new DOA position is present and position not confirmed, or new DOA position does not match MCC Reference Position. Corresponds to C/S message field 25.
10.3	snnn.nnn	Longitude of "B" location (if position not confirmed or position conflict alert) or new Doppler /DOA location matching MCC Reference Position (if position confirmed and a new Doppler position matches the MCC Reference Position). Set to "+000.000" if new DOA position is present and position not confirmed, or new DOA position does not match MCC Reference Position. Corresponds to C/S message field 26.
10.5	nn	Probability of "B" location (if Doppler position not confirmed or Doppler position conflict alert) or new Doppler location matching MCC Reference Position (if position confirmed and a new Doppler position matches the MCC Reference Position). Set to "00" for DOA position. Corresponds to C/S message field 28.
10.6	yy jjj hhmm	Time of next LEOSAR pass scheduled for "B" location (if position not confirmed) or MCC Reference Position (if position confirmed). Set to "00 000 0000" for MEOSAR alerts. Not provided for USA LEOLUTs. Corresponds to C/S message field 29.
10.7	n	Confidence factor for "B" location (if Doppler position not confirmed or Doppler position conflict alert) or new Doppler location matching MCC Reference Position (if position confirmed and a new Doppler position matches the MCC Reference Position), per C/S message field 29. Set to "0" for DOA position.
10.8.a	nnn.n	"B" location data residual standard deviation (if Doppler position not confirmed or Doppler position conflict alert) or new Doppler location matching MCC Reference Position (if position confirmed and a new Doppler position matches the MCC Reference Position), per C/S message field 30. Set to "000.0" for DOA position.
10.8.b	nnn.n	"B" location data residual trend (if Doppler position not confirmed or Doppler position conflict alert) or new Doppler location matching

Line #. Field #	Format	Description
		MCC Reference Position (if position confirmed and a new Doppler position matches the MCC Reference Position), per C/S message field 30. Set to "000.0" for DOA position.

Lines 9 and 11 of Doppler alerts (e.g., SIT 175) contain the information shown in Table 10.5. These lines are not included in corresponding C/S SIT messages.

Table 10.5: Lines 9 and 11 in SARMaster Format Alerts as Generated by the USMCC

Line #. Field #	Format	Description
9.1	yy jjj hhmm	Time of next LEOSAR pass scheduled for the "A" location (if position not confirmed) or confirmed location (if position confirmed). Set to "00 000 0000" for MEOSAR alerts. Not provided for USA LEOLUTs. Corresponds to C/S message field 29.
9.2	ccc	Satellite for the next pass (per time above), always set to ' '. Defined in SARMaster format as field 669.
9.3	nnnnn	Orbit number for the next pass (per time above), always set to '00000'. Defined in SARMaster format as field 7b.
9.4	ccc	LUT for the next pass (per time above), always set to ' '. Defined in SARMaster format as field 673.
9.5	cccccc	Name of SRR for associated location or alert site. For the Canadian SRR, contains the name of the Canadian RCC (first 6 characters).
11.1	yy jjj hhmm	Time of next LEOSAR pass scheduled for the "B" location (if position not confirmed) or default value '00 000 0000' (if position confirmed). Set to "00 000 0000" for MEOSAR alerts. Not provided for USA LEOLUTs. Corresponds to C/S message field 29.
11.2	ccc	Satellite for the next pass (per time above), always set to ' '. Defined in SARMaster format as field 669.
11.3	nnnnn	Orbit number for the next pass (per time above), always set to '00000'. Defined in SARMaster format as field 7b.
11.4	ccc	LUT for the next pass (per time above), always set to ' '. Defined in SARMaster format as field 673.
11.5	cccccc	Name of SRR for associated location or alert site. For the Canadian SRR, contains the name of the Canadian RCC (first 6 characters). Always set to blanks for DOA position.

A few sample messages generated for Canadian RCCs in SARMaster format are provided below.

Sample SIT 173 Message (Position conflict, encoded position only)

```
/00021 00000/3660/15 293 1441.00
/173/3160/215/01
/3675/+12018.4 005.3 +01.12/15 274 2238 31.48/02
/96E736C98F25EF3FE99E370E23BABA
/00000/03/00/ /002.863/0000/0000/2DCE6D931EFFBFF/USA
/2DCE6D931EFFBFF/+37.691/-121.812
/LASSIT
/ENDMSG
```

Sample SIT 175 Message (DOA position, position not confirmed)

```
/58192 00000/3660/16 109 1813.00
/175/3160/300/01
/3669/+8/+02968.7 000.5 -00.08/16 109 1812 35.33/0
/0/00.000/0013/04
/53C6F801B1A01D6B50911000000000
/06347/00/00/ /000.421/0000/0000/A78DF00363403AD/CANADA
/A78DF00363403AD
/+316/+54.345/-130.357/337 012.1 083.8/00/00 000 0000/0/000.0
000.0
/00 000 0000/000/00000/   /TRENTO
/+000/+00.000/+000.000/000 000.0 000.0/00/00 000 0000/0/000.0
000.0
/00 000 0000/000/00000/   /
/LASSIT
/ENDMSG
```

Sample SIT 177 Message (Position Confirmation, Doppler position)

```
/00037 00030/3660/15 289 1913.00
/177/3160/012/01
/7601/-4/+02968.7 000.5 -00.08/15 288 2212 35.33/0
/9/03.989/0000/12
/53C6F801B1A01D6B50911000000000
/06346/02/00/ /000.421/0000/0000/A78DF00363403AD/CANADA
/A78DF00363403AD
/+366/+48.154/-122.153/000 000.0 000.0/99/15 289 1029/2/002.5
000.8
/00 000 0000/000/00000/   /
/-366/+45.881/-133.719/068 000.9 000.5/01/00 000 0000/2/002.5
000.8
/15 289 1029/S12/34460/AK2/AFRCC
/LASSIT
/ENDMSG
```

ANNEX 11 - SARMASTER FORMAT

Extracted from the CMCC "SARMaster System Manager User Guide"
(Issued 07 Sept 2010, Document Part Number: MN-1066-70001-1)

APPENDIX A - COSPAS-SARSAT MCC TO RCC INTERFACE

A.1 Overview

The information described in this appendix provides an overview of modifications that have been implemented to allow the Mission Control Centre (MCC), using the Operation Control Console (OCC), to transmit beacon alerts to a designated Rescue Coordination Centre (RCC) using SARMaster.

Additional beacon format information can be obtained from either the Cospas-Sarsat Web site located at www.cospas-sarsat.org or contacting EMS Technologies Support.

A.2 Additional Data Message Fields

The data message fields (MFs) are listed by number, name, content, and template.

MF#	NAME	CONTENT	TEMPLATE
665	ELT_INFO	ELT_INFO field as recorded by the OCC in the RAW message data. This field contains either the pair of ELT_ID values for non-406 beacons formatted as [####,####] or a description of the 406 beacon type. A single slash can be embedded in this field – this requirement should be removed in future.	Free form non-fixed length text
666	ELT_ID1	Identifies the A side solution of non-406 beacons with a unique value that an OCC Operator can use to identify the beacon. Internal field sent by the OCC. Not a fixed length.	aaa……aaaa
667	ELT_ID2	Identifies the B side solution of non-406 beacons with a unique value that an OCC Operator can use to identify the beacon. Internal field sent by the OCC. Not a fixed length.	aaa……..aaaa
668	Duration	Duration of the beacon in hours	nnn.nnn
669	Satellite Name	Text initials for satellite name (i.e. S3)	aaa
670	Number of passes	Number of distinct satellite passes detected. The same pass detected by two or more different LUTs will only be counted once.	nn
671	Number of solutions/Hits	Number of solutions developed. Includes all LUTs and all satellite passes. This counts solutions detected from the same satellite pass but two different LUTs as 2 entries.	nn
672	SRR Name	Name of the SRR which is responsible for the particular solution. No fixed length	aaa….aaaa
673	Next Visibility LUT name	Name of the LUT that will have the next visibility for the solution. Not a fixed length	aaa….aaaa

674	Missed Pass Solution	Indicates which of the A or B solutions is for a missed pass. The entries are as follows: Blank – neither are a missed pass. A – A side (first line) is a missed pass. B – B side (first line) is a missed pass. AB – both are missed passes.	aa

A.3 Modified Data Message Fields

The data message fields (MFs) are listed by number, name, template, and content.

MF#	NAME	CONTENT	TEMPLATE
1B	Original Message Number	The original message number sent by the OCC to the RCC for this beacon.	nnnnn
7B	Next Visibility Orbit	Orbit number for the next visibility of the solution	nnnnn

A.4 SIT Messages

In cases where 2 solutions are available, if MF #24 is

- positive for both, the values are Doppler locations from a pass.
- positive for one and negative for the other, the positive side is the resolved location, and the negative side is the Doppler location from the pass used to create the resolved location (the image Doppler location is not available in this case).

A.4.1 Sample SIT 165

Note: The two Doppler solutions will be the unresolved elemental locations from the pass.

MF #	Sample SIT 165
01, 02, 03	/12738 00000/2320/99 279 1958
04, 05, 06, 08	/165/3660/006/01
11, 12, 13, 14, 15	/3233/+2/-21198.0 006.0 +01.20/99 279 1947 51.15/0
16, 17, 18, 19, 20	/2/12.458/0000/00/0000 99
1B, 670, 671, -, 668, 666, 667, 22, 665	/00000/01/01/ /0000.000/1234/1235/12ABC12ABC12ABC/1234,1235
24, 25, 26, 27, 28, 29, 30, 31	/+366/+39.112/-054.744/081 012.9 005.8/72/99 279 2134/1/016.0 013.0
29, 669, 7B, 673, 672	/99 279 2134/ S3/07858/DEVLUT/SRR
24, 25, 26, 27, 28, 29, 30, 31	/+366/+32.704/-085.182/070 013.4 006.2/28/99 279 2134/1/016.0 013.0
29, 669, 7B, 673, 672	/99 279 2134/ S3/07858/DEVLUT/SRR
	/LASTSIT
	/ENDMSG

Lines 6 and 7 are for the A solution. Lines 8 and 9 are for the B solution.

A.4.2 Sample SIT 167

Note: The two Doppler solutions will consist of the resolved composite location (MF #24 field is positive) and the corresponding Doppler location from the satellite pass (MF #24 field is negative.

MF #	Sample SIT 167
01, 02, 03	/12738 00000/2320/99 279 1958
04, 05, 06, 08	/167/3660/006/01
11, 12, 13, 14, 15	/3233/+2/-21198.0 006.0 +01.20/99 279 1947 51.15/0
16, 17, 18, 19, 20	/2/12.458/0000/00/0000 99
1B, 670, 671, -, 668, 666, 667, 22, 665	/00000/01/01/ /0000.000/1234/1235/12ABC12ABC12ABC/1234,1235
24, 25, 26, 27, 28, 29, 30, 31	/+366/+39.112/-054.744/081 012.9 005.8/72/99 279 2134/1/016.0 013.0
29, 669, 7B, 673, 672	/99 279 2134/ S3/07858/DEVLUT/SRR
24, 25, 26, 27, 28, 29, 30, 31	/-366/+32.704/-085.182/070 013.4 006.2/28/99 279 2134/1/016.0 013.0
29, 669, 7B, 673, 672	/99 279 2134/ S3/07858/DEVLUT/SRR
	/LASTSIT
	/ENDMSG

Lines 6 and 7 are for the composite solution. Lines 8 and 9 are for the corresponding doppler elemental solution.

A.4.3 Sample SIT 170

Note: MF #674 indicates which of the solutions was missed during an expected pass. The solutions given are the last valid solution for the Doppler A and B side. Only the solutions specified in #674 will be valid in the message.

MF #	Sample SIT 170
01, 02, 03	/12739 00000/2320/99 279 1958
04, 05, 06, 08	/170/3660/004/01
11, 12, 13, 14, 15	/3233/+1/-05689.0 017.0 +13.20/99 279 1515 03.56/0
16, 17, 18	/2/06.671/0000
1B, 670, 671, 674, 668, 666, 667, 22, 665	/12439/01/01/AB/000.000/1234/1235/12ABC12ABC12ABC/1234,1235
24, 25, 26, 27, 28, 29, 30, 31	/+366/+27.684/-089.899/002 013.1 0009.9/55/99 279 2016/1/016.0 013.0
29, 669, 7B, 673, 672	/99 279 2016/ C8/04115/DEVLUT/SRRName
24, 25, 26, 27, 28, 29, 30, 31	/+366/+24.462/-075.291/024 013.5 010.1/45/99 279 2016/1/017.0 013.0
29, 669, 7B, 673, 672	/99 279 2016/ C8/04115/DEVLUT/SRRName
	/LASTSIT
	/ENDMSG

Lines 6 and 7 are for the A solution (if present). Lines 8 and 9 are for the B solution (if present).

A.4.4 Sample SIT 172

MF #	Sample SIT 172
01, 02, 03	/00125 00000/2320/99 280 0954
04, 05, 06, 08	/172/2270/208/01
11, 13, 14, 21	/4444/+00176.5 000.0 +00.00/99 280 0954 01.29/01
23	/4E340BAA8681A68F613BC000000000
1B, 670, 671, - , 668, 666, 667, 22, 665	/00000/01/01/ /0000.000/1234/1235/12ABC12ABC12ABC/1234,1235
22	/9C6817550D034D1
	/LASTSIT
	/ENDMSG

A.4.5 Sample SIT 173

MF #	Sample SIT 173
01, 02, 03	/00125 00000/2320/99 280 0954
04, 05, 06, 08	/173/2270/208/01
11, 13, 14, 21	/4444/+00176.5 000.0 +00.00/99 280 0954 01.29/01
23	/4E340BAA8681A68F613BC000000000
1B, 670, 671, - , 668, 666, 667, 22, 665	/00000/01/01/ /0000.000/1234/1235/12ABC12ABC12ABC/1234,1235
22	/9C6817550D034D1
	/LASTSIT
	/ENDMSG

A.4.6 Sample SIT 174

MF #	Sample SIT 174
01, 02, 03	/00125 00000/2320/99 280 0954
04, 05, 06, 08	/174/2270/208/01
11, 13, 14, 21	/4444/+00176.5 000.0 +00.00/99 280 0954 01.29/01
23	/4E340BAA8681A68F613BC000000000
1B, 670, 671, - , 668, 666, 667, 22, 665	/00000/01/01/ /0000.000/1234/1235/12ABC12ABC12ABC/1234,1235
22	/9C6817550D034D1
	/LASTSIT
	/ENDMSG

A.4.7 Sample SIT 175

Note: The two Doppler solutions will be the unresolved elemental locations from the pass.

MF #	Sample SIT 175
01, 02, 03	/00130 00000/2320/99 280 1506
04, 05, 06, 08	/175/2270/004/01
11, 12, 13, 14, 15	/3233/-4/+00015.0 000.0 +00.00/99 280 1131 21.95/0
16, 17, 18, 21	/9/16.209/0000/07
23	/56EE000000000000477BEAC0000000000
1B, 670, 671, - , 668, 666, 667, 22, 665	/00000/01/01/ /000.000/1234/1235/12ABC12ABC12ABC/1234,1235
22	/ADDC0000000000008
24, 25, 26, 27, 28, 29, 30, 31	/+366/+43.556/+001.482/115 000.7 000.3/99/00 000 0000/4/001.0 000.0
29, 669, 7B, 673, 672	/00 000 0000/ /00000/ /SRR
24, 25, 26, 27, 28, 29, 30, 31	/+366/+52.449/-044.581/095 002.1 000.6/01/99 280 1804/4/001.0 000.0
29, 669, 7B, 673, 672	/99 280 1804/ S6/24583/DEVLUT/SRR
	/LASTSIT
	/ENDMSG

Lines 8 and 9 are for the A solution. Lines 10 and 11 are for the B solution.

A.4.8 Sample SIT 176

Note: The two Doppler solutions will be the unresolved elemental locations from the pass.

MF #	Sample SIT 176
01, 02, 03	/00130 00000/2320/99 280 1506
04, 05, 06, 08	/176/2270/004/01
11, 12, 13, 14, 15	/3233/-4/+00015.0 000.0 +00.00/99 280 1131 21.95/0
16, 17, 18, 21	/9/16.209/0000/07
23	/56EE000000000000477BEAC0000000000
1B, 670, 671, - , 668, 666, 667, 22, 665	/00000/01/01/ /000.000/1234/1235/12ABC12ABC12ABC/1234,1235
22	/ADDC0000000000008
24, 25, 26, 27, 28, 29, 30, 31	/+366/+43.556/+001.482/115 000.7 000.3/99/00 000 0000/4/001.0 000.0
29, 669, 7B, 673, 672	/00 000 0000/ /00000/ /SRR
24, 25, 26, 27, 28, 29, 30, 31	/+366/+52.449/-044.581/095 002.1 000.6/01/99 280 1804/4/001.0 000.0
29, 669, 7B, 673, 672	/99 280 1804/ S6/24583/DEVLUT/SRR
	/LASTSIT
	/ENDMSG

Lines 8 and 9 are for the A solution. Lines 10 and 11 are for the B solution.

A.4.9 Sample SIT 177

Note: The two Doppler solutions will consist of the resolved composite location (MF #24 field is positive) and the corresponding Doppler location from the satellite pass (MF #24 field is negative.

MF #	Sample SIT 177
01, 02, 03	/00130 00000/2320/99 280 1506
04, 05, 06, 08	/177/2270/004/01
11, 12, 13, 14, 15	/3233/-4/+00015.0 000.0 +00.00/99 280 1131 21.95/0
16, 17, 18, 21	/9/16.209/0000/07
23	/56EE00000000000477BEAC0000000000
1B, 670, 671, - , 668, 666, 667, 22, 665	/00000/01/01/ /000.000/1234/1235/12ABC12ABC12ABC/1234,1235
22	/ADDC0000000000008
24, 25, 26, 27, 28, 29, 30, 31	/+366/+43.556/+001.482/115 000.7 000.3/99/00 000 0000/4/001.0 000.0
29, 669, 7B, 673, 672	/00 000 0000/ /00000/ /SRR
24, 25, 26, 27, 28, 29, 30, 31	/+366/+52.449/-044.581/095 002.1 000.6/01/99 280 1804/4/001.0 000.0
29, 669, 7B, 673, 672	/99 280 1804/ S6/24583/DEVLUT/SRR
	/LASTSIT
	/ENDMSG

Lines 8 and 9 are for the composite solution. Lines 10 and 11 are for the corresponding doppler elemental solution.

A.4.10 Sample SIT 182

MF #	Sample SIT 182
01, 02, 03	/00125 00000/2320/99 280 0954
04, 05, 06, 08	/182/2270/208/01
11, 13, 14, 21	/4444/+00176.5 000.0 +00.00/99 280 0954 01.29/01
23	/4E340BAA8681A68F613BC000000000
1B, 670, 671, - , 668, 666, 667, 22, 665	/00000/01/01/ /0000.000/1234/1235/12ABC12ABC12ABC/1234,1235
22	/9C6817550D034D1
	/LASTSIT
	/ENDMSG

A.4.11 Sample SIT 183

Note: The two Doppler solutions will be the unresolved elemental locations from the pass.

MF #	Sample SIT 183
01, 02, 03	/00130 00000/2320/99 280 1506
04, 05, 06, 08	/183/2270/004/01
11, 12, 13, 14, 15	/3233/-4/+00015.0 000.0 +00.00/99 280 1131 21.95/0
16, 17, 18, 21	/9/16.209/0000/07
23	/56EE000000000000477BEAC0000000000
1B, 670, 671, - , 668, 666, 667, 22, 665	/00000/01/01/ /000.000/1234/1235/12ABC12ABC12ABC/1234,1235
22	/ADDC0000000000008
24, 25, 26, 27, 28, 29, 30, 31	/+366/+43.556/+001.482/115 000.7 000.3/99/00 000 0000/4/001.0 000.0
29, 669, 7B, 673, 672	/00 000 0000/ /00000/ /SRR
24, 25, 26, 27, 28, 29, 30, 31	/+366/+52.449/-044.581/095 002.1 000.6/01/99 280 1804/4/001.0 000.0
29, 669, 7B, 673, 672	/99 280 1804/ S6/24583/DEVLUT/SRR
	/LASTSIT
	/ENDMSG

Lines 8 and 9 are for the A solution. Lines 10 and 11 are for the B solution.

A.4.12 SIT 185 Messages

The software will recognize/process COSPAS-SARSAT format SIT 185 messages.

All SIT 185 variants described in the *2008 Cospas-Sarsat Mission Control Centres Standard Interface Description* (C/S A.002, Issue 4, 2008) are supported.

In the most recent version of this document (C/S A.002, Issue 5, 2009) this translates to messages with MF#45 (message type) values of:

- DISTRESS COSPAS-SARSAT POSITION RESOLVED ALERT
- DISTRESS COSPAS-SARSAT POSITION RESOLVED UPDATE ALERT
- DISTRESS COSPAS-SARSAT POSITION CONFLICT ALERT
- DISTRESS COSPAS-SARSAT INITIAL ALERT
- DISTRESS COSPAS-SARSAT NOTIFICATION OF COUNTRY OF BEACON REGISTRATION ALERT
- SHIP SECURITY COSPAS-SARSAT POSITION RESOLVED ALERT
- SHIP SECURITY COSPAS-SARSAT POSITION RESOLVED UPDATE ALERT
- SHIP SECURITY COPSAS-SARSAT POSITION CONFLICT ALERT
- SHIP SECURITY COSPAS-SARSAT INITIAL ALERT

Note: The sample shown on page C-13 of the 2009 SID is not supported.

This is the same functionality provided to the AFRCC in their 2009 software.

When one of these messages is received by SARMaster:

- Composite and elemental alert information will be extracted and displayed on the composites and elementals tab in the IMM.
- Narratives will be created based on the contained beacon information and displayed to the user if the system has been configured to do so via the COSPAS-SARSAT Narrative handling options in the IMM and Utilities.
- The SIT message will be visible on the messages tab in the IMM

Note: SIT 185 messages do not have a specified SRR so may be ignored by SARMaster if the system has been configured differentiate between messages which are inside versus outside the current SRR. To ensure that all SIT 185 messages are processed, the administrator must configure the system to process messages with a blank SRR as if they are "inside". A new "Blank SRRs are to be considered to be inside SRR" checkbox has been added to the "Database Output" tab of the ELT Receiver Service configuration dialog to support this. This checkbox must be selected to ensure that all SIT 185 messages are processed.

A.4.13 Sample SIT 605

MF #	Sample SIT 605
01, 02, 03	/00130 00000/2320/99 280 1506
04, 05, 06, 08	/605/2270/004/01
	This is a sample narrative message
	/LASTSIT
	/ENDMSG

A.4.14 Sample SIT 915

MF #	Sample SIT 915
01, 02, 03	/00130 00000/2320/99 280 1506
04, 05, 06, 08	/915/2270/004/01
	This is a sample narrative message
	/LASTSIT
	/ENDMSG

A.5 SIT Message Type Definitions

The following table describes and defines each of the SIT messages that can be received by the SARMaster system located at the RCC. In addition, the table shows the standard SIT number that the message most closely corresponds to in the Cospas-Sarsat Standard Interface Description (SID) documentation that can be obtained from Cospas-Sarsat.

Note: SARMaster SIT messages may contain different information than the C/S equivalent and the specific section for the SARMaster SIT message should be referred to.

Number	Derived from C/S SIT	Description
165	115	121.5/243 Incidents
167	117	121.5/243 Ambiguity resolution
170	N/A	Missed pass notification
172	122	406 Incident (No Doppler)
173	123	406 Position conflict (Encoded Only)
174	124	406 Ambiguity resolution (encoded only)
182	132	406 Notification of country of registration (encoded only)
175	125	406 Incident
176	126	406 Position conflict
177	127	406 Ambiguity resolution
183	133	406 Notification of country of registration

ANNEX 12 - GUIDANCE ON PROVIDING INCIDENT FEEDBACK TO THE USMCC

When an alert site closes, the USMCC will send a Site Closure (SIT 176 or 376) message to each RCC and USA SPOC that was an active message destination for the alert site at the time of the site closure. The Site Closure message that is sent to USA SPOCs includes an Incident Feedback form for SPOCs to complete, either by writing on the form (if they received a paper copy of the message) or in a text document (if they received the message electronically). The completed form should be sent to the USMCC by fax (301.817.4568), email (USMCC@noaa.gov), or AFTN (KZDCZSZA), within 12 hours of receipt of the Site Closure message. Note that the form must be available in a text document in order to be provided by AFTN. USA RCCs log into the IHDB and provide feedback directly into the online IHDB. Descriptions of false alerts are provided in the table below and can be viewed online without an IHDB account at https://incidenthistory.noaa.gov/IHDB/examplesFalseAlerts.

A description of the data fields on the Incident Feedback form follows. Note that all times should be provided in UTC.

Field	Description
BEACON ID (Provided by USMCC)	The beacon ID for which feedback is to be provided.
SITE ID (Provided by USMCC)	Alert Site number for which feedback is to be provided. If an alert site closes for a beacon ID and a new alert site is later opened for the same beacon ID, then the new alert site will have a different (unique) number.
CLOSE TIME (Provided by USMCC)	Time that the USMCC alert site closed, in UTC. Format is DD HHMM MON, where DD is the day of the month, HH is hours of day, MM is minutes of hour, and MON is the month.
ACTUAL LOCATION **LAT: LONG:**	True location (LATitude, LONGitude) of the beacon, estimated independently of USMCC alert data. Acceptable formats are provided below. • LAT: DD MM-SSH, DD MM.mH or sDD.ddd, • LONG: DDD MM-SSH, DDD MM.mH, sDDD.ddd where DD and DDD are degrees, MM is minutes, SS is seconds, s="+" or "-," ddd is fraction of degrees, m is fraction of minutes and H is hemisphere (E=east, W=west, N=north, S=south).
INCIDENT OUTCOME	Select one of the following: • DISTRESS • NON-DISTRESS • CEASED/UNDETERMINED The INCIDENT OUTCOME should be consistent with the REASON ACTIVATED (see below).
INCIDENT TYPE	Select one of the following choices. • AVIATION - beacon activated on an aircraft • MARITIME - beacon activated in a maritime area, not on an aircraft • TERRESTRIAL - beacon activated on land, not on an aircraft • UNKNOWN
BEACON REGISTRATION USED TO RESOLVE INCIDENT	Indicates if 406 MHz beacon registration data helped resolve the incident. • PRIMARY MEANS TO RESOLVE CASE indicates that beacon registration data was the primary means used to resolve the incident. • CONTRIBUTED TO CASE RESOLUTION indicates that beacon registration data contributed to incident resolution as a secondary means.

Field	Description
	• NOT USED indicates that beacon registration data was not available or did not help resolve the incident.
BEACON REGISTRATION ACCURACY	Only applicable if beacon registration was accessed. The beacon registration may have been provided with the alert message, or provided in another registration database (such as the C/S International Beacon Registration Database). Provide a separate answer (ACCURATE, NOT ACCURATE, or UNVERIFIED) for each section below: • OWNER INFORMATION • EMERGENCY CONTACT INFO • VESSEL/AIRCRAFT USAGE INFO IF "NOT ACCURATE," provide at least one registration field that was determined to be inaccurate. This information is used to improve the accuracy of beacon registration databases.
SARSAT DATA USED TO RESOLVE INCIDENT	Select one of the following choices. • YES ONLY NOTIFICATION - the USMCC/SARSAT alert was used to resolve the incident, and no independent data was used to resolve the incident. Applicable if any beacon registration data was used due to receipt of a SARSAT alert. • YES FIRST NOTIFICATION - the USMCC/SARSAT alert data was used to resolve the incident, was the first data received that was used to resolve the incident, but other independent data was also used to resolve the incident. Applicable if any beacon registration data was used due to receipt of a SARSAT alert. • YES ASSISTED - the USMCC/SARSAT alert data helped to resolve the incident, but independent data was received earlier that was also used to resolve the incident. Applicable if any beacon registration data was used due to receipt of a SARSAT alert. • NO - the USMCC/SARSAT alert and/or beacon registration data was not used to resolve the incident; either independent data alone was used to resolve the incident or the INCIDENT OUTCOME is UNDETERMINED.
NUMBER RESCUED	Number of people rescued in the incident (only set if INCIDENT OUTCOME is DISTRESS).
NUMBER IN DISTRESS	Number of people who were in distress in the incident (only set if INCIDENT OUTCOME is DISTRESS). Does not include rescue personnel.
REASON ACTIVATED	REASON ACTIVATED must be consistent with INCIDENT OUTCOME. The following descriptions are based on information provided in document C/S A.003. If INCIDENT OUTCOME is DISTRESS, select one of the following. • AUTOMATIC (distress, automatic beacon activation) • MANUAL (distress, manual beacon activation) • ACTIVATION METHOD UNKNOWN If INCIDENT OUTCOME is NON-DISTRESS, select a FALSE ALERT type from the following (this information is also provided online at https://incidenthistory.noaa.gov/IHDB/examplesFalseAlerts: Beacon Mishandling (Resulting in an Unintended Activation) False Alert - Beacon Mishandling - Improper Installation Procedure/Location • Exposed to sea action or ship's work, beacon activated by sea spray or wave, crewman bumped beacon, equipment struck beacon, beacon installed upside down, improperly placing beacon into bracket. False Alert - Beacon Mishandling - Improper Testing and Maintenance • Failure to follow proper testing procedures, negligence, poor beacon testing instructions, aircraft in situ test. Inspection by authorized inspector: accidental activation during vessel equipment inspection.

Field	Description
	• Repair by owner (usually unauthorized) or authorized facility: causing damage to beacon, activation during battery change, changing of hydrostatic release while servicing beacon. • Improper removal from bracket: inspection, test, cleaning, or safe keeping without switching off. • Beacon shipped to/by retailer, owner, repair facility (in transit): shipped while armed, improperly packed, improperly marked, rough handling. • Maintenance of craft: mechanical, electronic, wash down, painting, winterization. • Beacon stored improperly: stored while armed. False Alert - Beacon Mishandling - Improper Use • Accidental activation: beacon activated operationally in an attempt to perform self-test or beacon activated in an attempt to ascertain beacon ID or 24-bit address from a local receiving device and beacon signal was unintentionally transmitted to satellite. False Alert - Beacon Mishandling - Improper Disposal of Beacon • Beacon sold with craft for scrap, discarded as trash, abandoned. Beacon Malfunction False Alert - Beacon Malfunction - Faulty Activation Switch • Faulty activation switch, i.e., gravity activated, magnetic, mercury, or crash. • Hard landing, excessive craft vibration. False Alert - Beacon Malfunction - Water Ingress/Intrusion • Water leakage due to manufacturing defect, cracked casing, faulty seal. False Alert - Malfunction - Transmitting Distress Signal While in Test Position • Transmitted non-inverted frame sync while in test mode. False Alert - Malfunction - Electronics Malfunction • Non-GPS electronics malfunction. Mounting Failure False Alert - Mounting - Strap or Bracket Failure • Strap failure, mounting bolts sheared, retainer pin broken, beacon fell out of bracket. False Alert - Mounting - Release Mechanism Malfunction for EPIRB • Premature hydrostatic release. False Alert - Mounting - Faulty Mounting Magnet for Externally Mounted ELT • Switch magnets not effective. False Alert - Mounting - Avionics-Beacon Interface Malfunction for ELT(DT) • Activation of an ELT(DT) due to failure or an out-of-tolerance condition experienced by the aircraft interface module. Environmental Conditions False Alert - Environmental Conditions - Extreme Weather Conditions • Hurricane/cyclone conditions, vessel knocked down, aircraft overturned, heavy seas, ice build-up. Maintenance Activations • Intentional activation for testing purposes by a person performing maintenance. Voluntary Activations False Alert - Voluntary Activations - Non-Declared Tests • Activation of beacon for test, without proper notification or agreement of authorities other than by a person performing maintenance. False Alert - Voluntary Activations - Malicious Activations • Malicious activations, hoax.

Field	Description
	Unknown (Confirmed Beacon Activations) • No feedback received on why beacon activated. • Investigation into beacon activation cause was inconclusive.
CASE SUMMARY	Additional information about the incident. If INCIDENT OUTCOME is DISTRESS, provide details on what caused the distress, the SAR forces launched (what, where, and when) and how USMCC/SARSAT alert data and other information that was used to assist the rescue. USMCC personnel will follow up with the RCC/SPOC, as needed, to clarify information that the RCC/SPOC provided about DISTRESS cases.

ANNEX 13 - SRRs FOR NON-USA ADDRESSES ASSIGNED IN THE USA REGISTRATION DATABASE (RGDB)

SRRs are assigned for USA-coded beacons with a non-USA home port or airport (primary) or the beacon owner's home address (secondary) in the RGDB as follows.

State/Country Abbreviation	State/Country Name	EPIRB SRR 01	EPIRB SRR 02	ELT SRR 01	PLB SRR 01
AN	Antigua	SANJN		AFRCC	AFRCC
BH	Bahamas	CGD07		AFRCC	AFRCC
BL	Belize	CGD07		AFRCC	AFRCC
BR	Bermuda	CGD05		AFRCC	AFRCC
CI	Cayman Islands	CGD07		AFRCC	AFRCC
CR	Costa Rica	PacArea		AFRCC	AFRCC
DR	Dominican Republic	SANJN		SANJN	SANJN
ES	El Salvador	PacArea		AFRCC	AFRCC
GT	Guatemala	PacArea		AFRCC	AFRCC
HN	Honduras	CGD07		AFRCC	AFRCC
JA	Jamaica	CGD07		AFRCC	AFRCC
MR	Marshall Islands	CGD14	`	CGD14	CGD14
MX	Mexico	CGD08		AFRCC	AFRCC
NA	Netherlands Antilles	SANJN		SANJN	SANJN
NI	Nicaragua	CGD07		AFRCC	AFRCC
PR	Puerto Rico	SANJN		SANJN	SANJN
RP	Panama	CGD07		AFRCC	AFRCC
SV	Saint Vincent	SANJN		SANJN	SANJN
VI	Virgin Islands	SANJN		SANJN	SANJN

ANNEX 14 - DISTRIBUTION OF ALERTS BY COUNTRY CODE FOR NON-USA COUNTRIES IN THE USA SERVICE AREA

SRRs are assigned for NOCRs, unlocated alerts and SSAS alerts for non-USA countries (i.e., countries with codes for which beacons cannot be registered in the RGDB) in the USA service area as follows.

Country Code(s) (RCC Message Field "Country Code")	Country/Region Name	10 Digit Name (RCC Message Field "Country")	SRR for NOCRs and Unlocated Alerts	SRR for SSAS Alerts
306	Curaçao (Former Netherlands Antilles)	FORMERNANT	NANTSP*	NANTSS
307	Aruba	ARUBA	NANTSP*	ARUBSS
308, 309	Bahamas	BAHAMAS	CGD07	BHAMSS
310	Bermuda	BERMUDA	BERMUDASP	BERMSS
311	Bahamas	BAHAMAS	CGD07	BHAMSS
312	Belize	BELIZE	COCESNA	BELZSS
314	Barbados	BARBADOS	SANJN	BARBSS
319	Cayman Islands	CAYMAN IS	CGD07	CAYMSS
321	Costa Rica	COSTA RICA	COCESNA	COCESNA
323	Cuba	CUBA	CGD07	CUBASS
327	Dominican Republic	DOMINICAN	DOMREPSP*	LANTAREA
330	Grenada	GRENADA	SANJN	GRENSS
332	Guatemala	GUATEMALA	COCESNA	GUATSS
334	Honduras	HONDURAS	COCESNA	HONDSS
336	Haiti	HAITI	HAITISP**	HAITSS
339	Jamaica	JAMAICA	CGD07	JAMASS
345	Mexico	MEXICO	MEXISP	MEXISP
350	Nicaragua	NICARAGUA	COCESNA	NICASS
351 – 357	Panama	PANAMA	PANASP	PANSS
359	El Salvador	ELSALVADOR	COCESNA	COCESNA
362	Trinidad and Tobago	TRINIDAD	TTSP*	TRINSS
364	Turks and Caicos Islands	CAICOS IS	CGD07	CAICSS
370 - 374	Panama	PANAMA	PANASP	PANSS
375 - 377	Saint Vincent & the Grenadines	ST VINCENT	SANJN	LANTAREA
378	British Virgin Islands	VIRGIN GB	SANJN	BVISS
510	Micronesia	MICRONESIA	MARSEC***	PACAREA
511	Palau	PALAU	MARSEC***	PALASS
538	Marshall Islands	MARSHALL I	CGD14	MARSHSS
730	Colombia	COLOMBIA	COLMSP	COLMSS
735	Ecuador	ECUADOR	ECSP	ECSS
750	Guyana	GUYANA	GUYSP	GUYSS
775	Venezuela	VENEZUELA	VZMCC	VENZSS

**All alerts, including located alerts, are copied to SANJN. See also Annex 7.*

***All alerts except SSAS alerts are copied to CGD07. See also Annex 7.*

****USMCC destination "MARSEC" corresponds to US Coast Guard Sector Guam.*