National Data Distribution

SAR Controllers Training 2014

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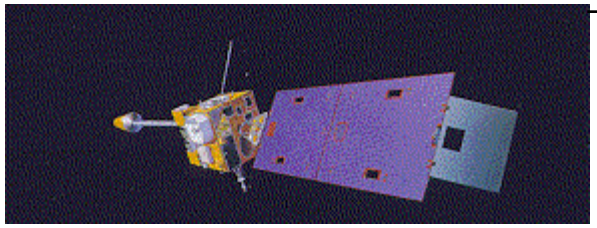
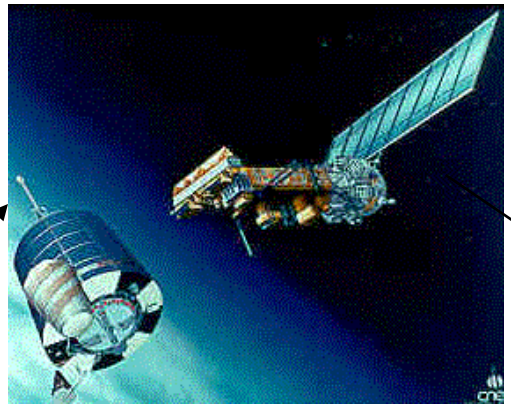
Overview

- Data Distribution for the C/S System
- Principles of National Data Distribution
- Unlocated Alerts
- Located Alerts
- Notification of Country of Registry (NOCR)
- Ship Security Alert System (SSAS) Beacons and Unknown Beacon Types
- Other Information/Messages

Data Distribution for C/S System



GEO Satellites



LEO Satellites

Rescue Coordination Centers

SAR Points of Contact

Mission Control Center

Other Mission Control Centers

Emergency Beacons

Principles of National Data Distribution

- Largely the same as International Data Distribution
  - International based on Cospas-SARSAT requirements
- Where different, USMCC distributes more data nationally
- This presentation focuses on how National Data Distribution is different from International Data Distribution

Unlocated Alerts – U.S. Registered

- For 406 MHz beacon IDs with U.S. country code (303, 338, 358, 366, 367, 368, 369, 379, 536 or 559)
  - If the beacon is registered in U.S. 406 RGDB
    - Alert is distributed based on SRR in registration
    - SRR in registration is based on
      - State or country of homeport, or
      - State or country of owners mailing address
    - If no SRR is assigned, alert is distributed based on type of beacon
      - EPIRBs to PACAREA
      - ELTs to AFRCC
      - PLBs to AFRCC

Principles of National Data Distribution

RGDB SRR Assignments

State Abbreviation	State Name	Srr01	Srr02	ELTSrr	PLBSrr01
AN	Antigua	San Juan		AFRCC	AFRCC
BH	Bahamas	CGD7		AFRCC	AFRCC
BL	Belize	CGD7		AFRCC	AFRCC
BR	Bermuda	CGD5		AFRCC	AFRCC
CI	Cayman Islands	CGD7		AFRCC	AFRCC
CR	Costa Rica	PacArea		AFRCC	AFRCC
DR	Dominican Rep.	San Juan		San Juan	San Juan
ES	El Salvador	PacArea		AFRCC	AFRCC
GT	Guatemala	PacArea		AFRCC	AFRCC
HN	Honduras	CGD7		AFRCC	AFRCC
JA	Jamaica	CGD7		AFRCC	AFRCC
MR	Marshall Isl.	CGD14	`	CGD14	CGD14
NA	Neth. Antilles	San Juan		San Juan	San Juan
NI	Nicaragua	CGD7		AFRCC	AFRCC
PR	Puerto Rico	San Juan		San Juan	San Juan
RP	Panama	CGD7		AFRCC	AFRCC
SV	Saint Vincent	San Juan		San Juan	San Juan
VI	Virgin Islands	San Juan		San Juan	San Juan

Unlocated Alerts – U.S. Non-Registered

- Alerts for unregistered U.S. beacons with a craft ID (vessel or aircraft) encoded in the 406 MHz beacon message that can be used to access another registry are distributed based on beacon type:
  - EPIRBs to PACAREA
  - ELTs to AFRCC
  - PLBs are not sent, no link to another registry
- Alerts for unregistered U.S. beacons with no craft ID (no link to another registry) are not distributed

Unlocated Alerts – Alternate Registry

- Craft ID decoded from the 406 MHz beacon message (15 hex ID) and provided on the RCC alert message can be used to access other registration databases:
  - EPIRBs: Radio Call Sign, Ship Station ID, etc.
    - RCC must look up using ITU or other source
  - ELTs: 24-bit address, aircraft operator designator, etc.
    - RCC must look up using tail number database
- Craft ID is provided in "Beacon Decode" section of RCC message

Unlocated Alerts – Non-U.S. Beacons

- Unlocated alerts for a non-U.S. beacon with country code in the U.S. Search and Rescue Region (SRR) are distributed based on country code:
  - To the country's SPOC if the USMCC communicates directly with the SPOC
    - Example, Colombian beacon goes to Colombia
  - Otherwise, to the U.S. RCC in whose SRR includes the country
    - Example, Cuban beacon goes to CGD7

Unlocated Alerts - Summary

- USMCC message distribution is based on
  - Country code (non-US beacons)
  - SRR in registration (registered U.S. beacons)
  - Beacon type (non-registered U.S. beacons with craft ID)

Located Alerts (1 of 3)

- Follows same procedures as C/S international except:
  - Distributes alerts to U.S. RCCs in buffer zones
  - Sends new alerts to all previous recipients for alert site (RCCs, SPOCs and MCCs) until ambiguity is resolved
  - Continues to send to RCCs and SPOCs after ambiguity is resolved
  - Sends pass position update, prior to ambiguity resolution, if A side probability increases by at least 30%
  - Sends located and unlocated alerts for U.S. special program beacons specially (append or replace mode)
  - Sends missed pass messages (not defined by C/S) except when site has position conflict before ambiguity is resolved

Located Alerts (2 of 3)

- Before ambiguity is resolved
  - Each new alert is sent based on the updated composite
  - Unlocated alerts are sent as “detection update” when:
    - Two hours have passed since previous alert for beacon or
    - Previous message for beacon was missed pass
  - Pass position update is sent, when prior to ambiguity resolution, the A side probability increases by at least 30%
  - New alerts are sent to all previous recipients for alert site (RCCs, SPOCs and MCCs) until ambiguity is resolved
  - Once position conflict occurs, no next pass or missed pass information is sent for alert site until ambiguity is resolved

Located Alerts (3 of 3)

- When ambiguity is resolved
  - Every previous recipient is notified
  - Next pass information is provided for resolved location
- After ambiguity is resolved
  - Subsequent alerts are sent only to the RCC or SPOC with the resolved location (subsequent alerts are not sent to MCCs)
  - Sends unlocated alerts as “detection update” when:
    - Two hours have passed since previous alert for beacon or
    - Previous message for beacon was missed pass
  - Next pass and missed pass information is provided for resolved location
  - Subsequent alerts are sent to RCCs and SPOCs until the site closes
  - Position conflict only refers to the distance between the resolved location and the new alerts location

NOCR (1 of 4)

- Notification of Country of Registry (NOCR) distribution:
  - MCC to MCC based on country code and location of the beacon
    - When an MCC detects a beacon located in its service area for a country outside of its service area, an alert is sent
    - Alert must have a location
  - USMCC distributes an NOCR to a U.S. RCC when it has not previously sent a located alert for the alert site, and
    - It detects a beacon with a U.S. country code in another service area, or
    - An NOCR for a U.S. country-coded beacon is received from another MCC
  - The USMCC:
    - Only sends one NOCR per alert site
    - Keeps sending alerts to the RCC for that site until the site closes or the RCC requests not to get alerts
    - Sends an ambiguity resolution message (if the first located alert resolves ambiguity)
    - Will not send an NOCR if it has already sent an alert message for the site with a location to a U.S. RCC

NOCR (2 of 4)

- NOCRs are distributed to a U.S. RCC essentially using the same rules as an unlocated alert
  - NOCRs for registered U.S. beacons are distributed to a U.S. RCC based on the SRR in the beacon's registration
  - NOCRs for unregistered U.S. beacons are distributed to a U.S. RCC based on beacon type
    - EPIRBs are sent to PACAREA
    - ELTs and PLBs are sent to AFRCC
    - Unlike unlocated alerts, craft ID is not considered in deciding whether to send an NOCR

NOCR (3 of 4)

- Some RCCs request the USMCC Controller to confirm that the SPOC of the SRR associated with the beacon position received the alert.

- The intent of NOCR procedures is that the RCC contact the SPOC of the SRR directly.

NOCR (4 of 4)

- CH-1 TO THE U.S. COAST GUARD ADDENDUM TO THE UNITED STATES NATIONAL SEARCH AND RESCUE SUPPLEMENT (NSS) TO THE INTERNATIONAL AERONAUTICAL AND MARITIME SEARCH AND RESCUE MANUAL (IAMSAR), COMDTINST M16130.2D
- (7) **Notification of Country of Registry (NOCR).** Command Centers may occasionally receive messages through the SARSAT system providing "Notification of Country of Registry" or NOCRs. These messages provide notification of the activation of a U.S. registered EPIRB in a location outside of the U.S. SAR Region. In these instances, the beacon activation alert has been forwarded to the appropriate RCC in the nation that has SAR responsibility for the composite position of the beacon, and the United States SAR authorities are being notified as a follow up to the normal SAR response process. Whenever possible, RCCs should attempt to contact the responsible RCC to ensure that SAR response efforts are being taken to assist U.S. citizens in distress.
- http://www.cospas-sarsat.org/DocumentsASeries/A1NOV1_07.pdf, ANNEX I/D, SAR POINTS OF CONTACT

SSAS Beacons and Alerts for Unknown Beacon Types

- Alerts for U.S. Ship Security Alert System (SSAS) beacons
  - Distributed to LANTAREA
  - After a SSAS beacon is detected, LANTAREA may request alerts be sent to other RCC(s)
- Alerts for unknown beacon types in U.S. SRR:
  - 406 MHz beacon message failed validation checks due to
    - Malfunctioning beacon or miscoded beacon
    - LUT or satellite processing
  - When 406 MHz beacon message fails validation checks:
    - All encoded data is considered unreliable, therefore
      - Unlocated alerts are not distributed because distribution of unlocated alerts is based on the country code
    - Distributed based on Doppler location and to USCG LANTAREA

Other Information/Messages (1 of 2)

- Next pass prediction is based on 3 minutes of mutual visibility; the satellite is simultaneously visible to
  - A U.S. LUT that is scheduled to take the pass and
  - The beacon (based on the reported location)
  - In addition, the satellite elevation must reach 5 degrees above the horizon
  - Next pass information only provided if the above criteria are met
  - Not computed for foreign LUTs
- A missed pass message is sent when the beacon is not detected, the mutual visibility criteria above is met and satellite passes at least 10 degrees above the horizon.

Other Information/Messages (2 of 2)

- Missed pass message is not sent when an unlocated alert is received (T3) before a predicted pass is received (T5) with a detect time after the predicted detection time (T2)
  - T1: 1201 - LUT AOS
  - **T2: 1208** - Predicted detection of located alert
  - **T3: 1209** - GOES detection received (USMCC receives updates every 20 minutes from U.S. GEOLUTs)
  - T4: 1216 - LUT LOS
  - **T5: 1217** - Data at USMCC received for LEO pass with no location for the beacon (pass may have an unlocated alert for the beacon)
- After location is received, USMCC only sends unlocated alerts (detection updates) when no message was sent for 2 hours or the last message sent was a missed pass.
- Unlocated alerts will zero the missed pass counter.