National Data Distribution

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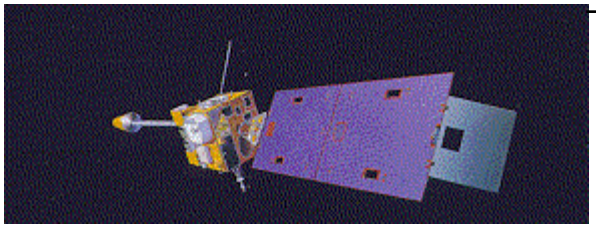
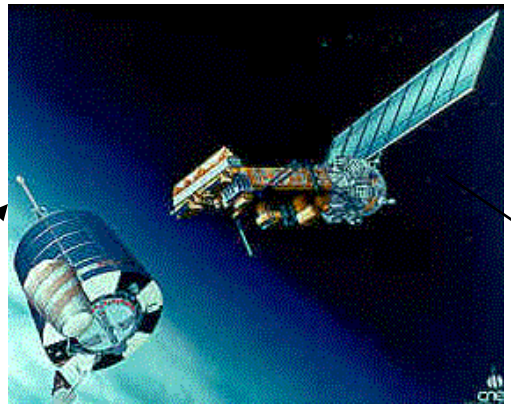
Overview

- 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 Point of Contacts

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

Unlocated Alerts – US Registered

- For 406 MHz beacon Id 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

Unlocated Alerts – US 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 <u>not</u> distributed

Unlocated Alerts – Alternate Registry

- Craft Id decoded from the 406 MHz beacon message (15 Hex Id) can be used to access other registration databases:
  - EPIRBS - Radio Call Sign, Ship Station Id, etc.
    - RCC must lookup using ITU or other source
  - ELTs – 24 bit Address, aircraft operator designator, etc.
    - RCC must lookup using Tail number database
- Craft Id provided in “Beacon Decode” section of RCC message

Unlocated Alerts – non US beacons

- Unlocated alerts for a non-US 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 distribution based on
  - Country Code (non-US beacons)
  - SRR in registration (registered US beacons)
  - Beacon Type (non-registered US beacons with Craft Id)

Alert Distribution with Location

- Follows same procedures as C/S International except (1 of 2):
  - Distributes alerts to U.S. RCCs in buffer zones
  - New alerts sent 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
- Before ambiguity is resolved
  - Each new alert is sent based on its location and
  - Once position conflict occurs, no next pass or missed pass information sent again for alert site until ambiguity is resolved
- When ambiguity is resolved
  - every previous recipient is notified
  - Subsequent alerts are sent only to the SRR with resolved location (subsequent alerts not sent to MCCs)
  - Next pass and missed pass information is provided for resolved location

Alert Distribution with Location

- Follows same procedures as C/S International except (2 of 2):
  - Sends pass position update, prior to ambiguity resolution, if A side probability increases by at least 30%
  - Sends unlocated alerts as “detection update” when:
    - Two hours have passed since previous alert for beacon or
    - Previous message for beacon was missed pass
  - Located and unlocated alerts for US special program beacons are sent specially (append or replace mode)
  - Sends missed pass messages (not defined by C/S)

Notification of Country of Registry (NOCR)

- Distribution:
  - MCC to MCC based on country code of beacon
    - When a MCC detects a beacon located in its service area for a country outside of its service area
    - *Alert* must have a location
  - USMCC distributes an NOCR to a U.S. RCC when:
    - It detects the conditions to generate an NOCR or receives an NOCR from another MCC
    - It will only send one NOCR per alert site
    - It will not send an NOCR if it has already sent an alert message with a location to a U.S. RCC

Notification of Country of Registry

- NOCRs are distributed to a U.S. RCC based on essentially 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 RGDB
  - NOCRs for unregistered U.S. beacons to a U.S. RCC distributed based on beacon type
    - EPIRBs are sent to PACAREA
    - ELTs and PLBs are sent to AFRCC
    - Unlike unlocated alerts, Craft Id is not required to send NOCRs

Notification of Country of Registry

- 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 **US** Ship Security Alert System (SSAS) beacons
  - Distributed to LANTAREA
  - After a SSAS beacon is detected, LANTAREA may direct alerts to other CG RCCs
- Alerts for unknown beacon types in **US 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:
    - The 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 can simultaneously see
  - A US LUT that is scheduled to take the pass and
  - The beacon (based on the reported location)
  - In addition, the satellite must reach 5 degrees above the horizon
  - Next Pass information only provided if these criteria 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 US 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.