

# The SARSAT Beacon



Volume 2, Issue 1

*Taking the "Search" Out of  
Search and Rescue*

September 2012

## ***A Message From the NOAA SARSAT Program Manager, Chris O'Connors***

The NOAA SARSAT Program is pleased to provide our partners in the Rescue Coordination Centers with the second edition of the "SARSAT Beacon" newsletter. If you were paying attention you noticed that I referred to the Rescue Coordination Centers as partners and that's for a very good reason. In the United States, the SARSAT Program is an interagency effort between NOAA, the US Air Force, the US Coast Guard, and NASA.

So, how do you play a part in improving the Program? The SARSAT Program reviewed your comments from this year's RCC Satisfaction Survey. From your comments, recommended actions were developed and approved by the Program. The recommended changes were weighed against the overall

benefit the change would produce in the SARSAT system. As in all cases where there is limited funding and manpower, not all of your recommendations could be implemented. It's important to note that a decision is not made by NOAA but is made by the interagency program representatives and each participant has a say in the outcome. So don't get discouraged if your suggestion doesn't get acted on and please keep participating in the annual survey and submitting those suggestions.

Finally, I want to stress how important the Incident History Feedback is to all of the partners in the SARSAT program. It is only through your diligent completion of the feedbacks that the SARSAT program knows how many lives have

been saved, how many emergency beacons are not registered, how valid the registration data is, and a myriad of other data that helps the partners make informed decisions about the future direction of the program.

I hope you enjoy this edition of the "SARSAT Beacon". Please remember that last year's edition of the SARSAT Beacon is can be found on the SARSAT website at:

<http://www.sarsat.noaa.gov/press-info.html>

Throughout the newsletter you can find contact information for NOAA SARSAT personnel and I hope you won't hesitate to contact them with your ideas, compliments, or complaints.

## ***What Can (and can't) the USMCC Controller Do For You?***

The USMCC Controller **can** assist the RCC controller:

- Close sites so the IHDB record will be created
- Change communication paths when requested
- Relay messages to appropriate USMCC personal
- Answer alert questions from RCCs and /or forwards calls to Operations Supervisor when needed.
- Send test messages

- Assist in retrieving registration information for foreign beacons
- Change SRRs for sites
- Site queries (O-plots) by position
  - ◊ Point radius
  - ◊ Corner points
  - ◊ Track boundaries by way points

But they **can't**...

- Advise the RCC Controller on their SAR activities such as whether to launch assets for an alert.

- Advise the RCC Controller on which position (A or B) of a first alert is most likely to be the "actual" position of a beacon.

- Assure the RCC that alerts were sent to RCCs outside of the US service area.

- Assure the RCC that a foreign RCC is actively prosecuting an alert for a US-coded beacon.

***If you have any questions or comments regarding the services provided by the USMCC Controllers – please contact Beth Creamer, Lead USMCC Controller at:***

[elizabeth.creamer@noaa.gov](mailto:elizabeth.creamer@noaa.gov)

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## The Air Force Rescue Coordination Center's Mission

### AFRCC Fast Facts:

- Led by LT Col Robert Russell, Commander of the Air Force Rescue Coordination Center
- Responsible for coordinating on-land federal SAR activities in the 48 contiguous United States .
- Staff of 27 Active Duty and Reserve Personnel.
- Coordinated more than 15,800 lives saved since 1974.
- Maintains a nationwide crash location database.



The Air Force Rescue Coordination Center's (AFRCC) mission is to coordinate civil search and rescue (SAR) throughout the 48 contiguous states as well as provide assistance to Mexico and Canada. Since 1974, when the Air Force consolidated three regions into one, at Scott AFB, the AFRCC has been in operation 24 hours a day, seven days a week, acting as the broker for federal assets to assist State Governors with civil SAR within their State. In March 2007, the AFRCC moved to Tyndall AFB under the 1<sup>st</sup> Air Force (AFNORTH) commander. The AFRCC also maintains instructors at the National SAR School at the U.S. Coast Guard Reserve Training Center, Yorktown, Va. Since 1974, the AFRCC has assisted in coordinating more than 15,800 lives saved.

When a distress call is received, the AFRCC controllers investigate the request, coordinate with federal, state, and local officials, and determine the type and scope of response necessary. Once verified as an actual distress situation, the AFRCC requests support from the appropriate federal SAR force. This may include Civil Air Patrol, U.S. Coast Guard, or Department of

Defense assets, as needed. Designated State agencies also contact the AFRCC to request Federal assistance. The AFRCC then validates the request to determine if Federal assets would be allowed to assist. The center's criteria for these determinations are that there must be a danger of the loss of life, limb, eyesight, or the chance of undue suffering. If possible, the AFRCC first attempts to resolve the incident without the use of federal assets. If they are unable to do so, the AFRCC then polls potential federal SAR assets to determine if they have the assets, resources, and ability to conduct the mission. Units that accept missions from the AFRCC are doing so of their own volition. The AFRCC has no tasking authority or funding source.

During ongoing SAR missions, the center serves as the communications hub and provides coordination and assistance to on-scene commanders or mission coordinators to recover the mission's objective in the safest, most effective manner possible. AFRCC uses state-of-the-art technology including a network of satellites, aircraft radar data, and cell phone forensics to help reduce the

critical time required to locate and recover people in distress.

In 2012, the AFRCC has worked over 3,000 incidents and over 400 missions with many more to come. Most of these incidents stem directly from the messages sent to us through the Search and Rescue Aided Satellite Tracking information provided by the U.S. Mission Control Center. With the USMCC's, and any other agencies' help and teamwork, the AFRCC is able to conduct our incidents and missions with precision so that others may live.



AFRCC Controllers



## *The SRR and BUFFER in RCC Alert Messages*

The SRR and BUFFER fields in the RCC alert message are based primarily on the reported (Doppler or encoded) location. The SRR is the primary Search and Rescue Region (SRR) in which the alert is located. The BUFFER is the second SRR in which the alert is located, which may be a buffer to (or an overlap of) the primary SRR. If an alert is located in the primary or buffer SRR for three or more SRRs, the alert message will only list two SRRs per location, but the message will be routed to all SRRs as appropriate.

If an alert is located outside of the SRR of Canada (MCC), Bermuda (SPOC), COCESNA (SPOC), the Dominican Republic (SPOC) or any US RCC, but within 50 km of its SRR boundary, then the USMCC designates the alert to be in the buffer for that SRR. Buffer SRRs are not designated for MCCs or SPOCs, except those identified above.

As agreed by the U.S. Air Force and U.S. Coast Guard, if an alert for an EPIRB is located in an U.S. Air Force (AFRCC or AKRCC) SRR and in the 50 km buffer of a U. S. Coast Guard SRR, then the Coast Guard SRR is listed as the primary SRR and the Air Force SRR is removed from the SRR list for that location.

While alert message destinations are primarily determined from the reported location, the message destination is also determined as follows:

a) For US Ship Security Alert beacons, all alerts (located and unlocated) are sent solely to LantArea (Coast Guard Ops Com).

b) For US special program beacons, alerts are sent based on special routing configuration, where the special routing either replaces normal routing or adds to normal routing, depending on the special program. Alerts for certain US special program beacons are routed specially to the AFRCC based on agreement between the Air Force and the associated special program.

c) For US registered beacons (i.e., US coded beacons in the RGDB) detected only as unlocated alerts, the SRR is based on the home port or airport of the craft for which the beacon is registered. If the home port or airport is not available, then the SRR for the owner's home address is used. If no SRR is available for a registered beacon, then distribution is based on beacon type (per item d).

d) For US unregistered beacons with a craft ID (i.e., with vessel or aircraft ID) detected only as unlocated alerts, the SRR is based on the beacon type: AFRCC for ELTs and PacArea for EPIRBs.

e) For US unregistered beacons without a craft ID detected only as unlocated alerts, no SRR is assigned and an unlocated alert is not distributed.

f) For non-US coded beacons

detected only as unlocated alerts, the SRR is based on the country code of the beacon ID, as specified on the C/S web site (sublinks "Operations" / "List of Country/Region Codes (MID), and "Contacts" / "SAR Points of Contact (SPOCs)).

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

1) Due to space limitations on the RCC message, only two SRRs are listed per location, as noted above. The Supporting Information section of the RCC message lists message destinations for additional SRRs not identified in the SRR BUFFER fields.

2) For Ship Security Alert System (SSAS) beacons the Competent Authority (message destination) is based on the country coded in the 406 MHz beacon ID and the SRR based on Doppler or encoded location is irrelevant. The Message Header section of the RCC alert message indicates if the beacon type is "Ship Security".

3) Alerts are routed specially for U.S. Special Program beacons, either in addition to normal routing or instead of normal routing. The Beacon Decode section of the RCC alert message indicates if a beacon is part of a special program.

4) Notification of Country of Registration (NOCR) alerts are sent to the country of registra-

tion (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 (168) and message name (NOTIFICATION OF COUNTRY OF REGISTRATION) in the Message Header indicate that an alert message is an NOCR.

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 ambiguity is resolved, regardless of location. This allows message destinations to coordinate a SAR response, as needed.

6) Once ambiguity is resolved, the destination for the resolved position will receive subsequent alerts for the alert site, regardless of location.

7) The USMCC Controller manually resends an alert to another RCC when requested by the RCC. The SRR on the resent alert message will be the same as on the initial alert.

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

**Want more information on the NOAA/SARSAT Program?**

Visit us on the web at: [www.sarsat.noaa.gov](http://www.sarsat.noaa.gov)

## Beacon Registration

Federal regulations (Title 47 of the CFR) require that US coded 406 MHz beacons be registered and this information be kept up-to-date. In addition, NOAA recommends beacon registrations be renewed every two years. NOAA maintains the U.S. 406 MHz Beacon Registration Database (RGDB), which contains more than 355,000 beacons, including about 184,600 EPIRBs, 62,800 ELTs, 107,700 PLBs and 250 Ship Security Alert System (SSAS) beacons.

Only about 70% of US coded beacons are registered despite the requirement under federal law to register all 406 MHz beacons. While the beacon owner is responsible

for registration, the SARSAT Program undertakes various outreach efforts to encourage beacon registration.

About 62% of registered US beacons have current information (i.e., updated in the last two years). Beacon registration information that has not been updated recently may still be valid. NOAA recommends RCC personnel attempt to use "non-current" registration information when working a SAR case for the associated beacon. Regardless of registration currency, RCC personnel should examine and use, as appropriate, the information in the Remarks and Special Status fields of

the Beacon Registration. When RCC personnel communicate with a beacon owner whose beacon is unregistered or whose registration is not current, they should encourage the owner to register the beacon or update the registration at [www.beaconregistration.noa.gov](http://www.beaconregistration.noa.gov).

If RCC personnel receive information relevant to beacon registration (e.g., that the beacon was sold) when working a SAR case, they should provide the information in the Additional Remarks in the NOAA Incident History Database (IHDB) record for the SAR case. To help make registration information more accurate for

sold beacons, RCC personnel should attempt to get contact information for the new owner and should ask the previous owner to change the status of their registration. USMCC personnel use the IHDB information to make appropriate updates to the Remarks and Special Status fields of the Beacon Registration, and to request beacon owners to update their registration.

### Additional Resources

- Our SARSAT website has been updated but additional suggestions are always welcome. Please visit the SARSAT website at [www.sarsat.noaa.gov](http://www.sarsat.noaa.gov) and if you have ideas for improving the website please submit your suggestions to [sarsat.Webmaster@noaa.gov](mailto:sarsat.Webmaster@noaa.gov)
- Several Cospas-Sarsat documents have been cited in this newsletter. You can find those publications and much more information at the Cospas-Sarsat website at [www.cospas-sarsat.org](http://www.cospas-sarsat.org)
- Alert messages from the USMCC contain "next pass" information but if you would like to see the SAR satellite's location and movement in real time you can do so at [www.n2yo.com/satellites/?c=7](http://www.n2yo.com/satellites/?c=7)
- Title 47 of the Code of Federal Regulations (CFR) referenced in this newsletter can be found at [http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?sid=ef8423070606ecbaa51f4e7e1448c032&c=ecfr&tpl=/ecfrbrowse/Title47/47tab\\_02.tpl](http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?sid=ef8423070606ecbaa51f4e7e1448c032&c=ecfr&tpl=/ecfrbrowse/Title47/47tab_02.tpl)
- Information for EPIRBs can be found in Part 80, Subpart V. For ELTs in Part 87, Subpart F; and for PLBs in Part 95, Subpart K.
- Following are links to the available SAR training opportunities
  - ◇ Maritime SAR Courses: [www.uscg.mil/teyorktown/Ops/SAR/default.asp](http://www.uscg.mil/teyorktown/Ops/SAR/default.asp)
  - ◇ Inland SAR Courses: <http://www.uscg.mil/teyorktown/Ops/SAR/Inland/default.asp>
  - ◇ AFRCC's Basic Inland SAR Course: [www.1af.acc.af.mil/library/factsheets/factsheet.asp?id=10789](http://www.1af.acc.af.mil/library/factsheets/factsheet.asp?id=10789)
  - ◇ SARSAT-hosted Search and Rescue (SAR) Controllers Training — next training scheduled for March 2013 in the Washington, DC Metro Area. More information to follow. For past SAR Training courses visit the USCG Office of SAR website at: [www.uscg.mil/hq/cg5/cg534/](http://www.uscg.mil/hq/cg5/cg534/)

#### Contact Info:

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## Frequently Asked Questions

*Q. What does a special status of "SOLD" mean on a beacon registration?*

A. A special status of "SOLD" on a beacon registration means this beacon registration has been marked by the previous owner as "Sold" and this beacon is now available to be registered by the new owner. The old registration information stays in the database until the new owner registers the beacon. When the new owner submits registration information for this beacon, the new owner information overwrites the old registration. RCCs may find additional information about the special status in the "special status info" field.

*Q. What does the special status "Out of service" mean on a beacon registration?*

A. This special status value was originally designed to indicate the beacon would not be used by anyone anymore, but we know from experience, people use it for:

- sold
- holding in storage for a temporary time frame
- sold the vessel or plane but plan to use the beacon again on a
- replacement vessel or plane
- sent the beacon in for repair
- disposed of the beacon

*Q. What is the difference between "Closing Alert Sites" and "Suppressing Alert Messages"?*

A. The USMCC collects alert data received for a specific 406 MHz beacon ID into an alert site. Alert sites are closed:

a) Automatically when the beacon is not detected by three consecutive satellites passes with visibility to beacon's reported location,

b) Automatically when no new alert data is received for the beacon for 18 hours, or

c) Manually by the USMCC Controller when requested by the RCC Controller.

When a 406 MHz alert site closes, a site closure (SIT 166) message is sent to the appropriate RCC(s) and a record for the closed site is added to the IHDB. RCC personnel can provide feedback in the IHDB once the record is added to the IHDB. Hourly the USMCC Controller reviews sites recently added to the IHDB and sends a reminder (SIT 950 message) to the RCC if the RCC has not provided feedback in the IHDB for an alert site that has been closed for at least an hour.

### USMCC Process for Manual Site Closure

Background. The USMCC Controller can manually close an alert site, in order to:

- a) allow the RCC to provide IHDB feedback in a timely manner for a beacon that has stopped transmitting, or
- b) allow a new alert site to be opened, when a significant change in beacon position (e.g., due to a rapidly moving beacon) caused multiple Position Conflict messages to be sent after ambiguity resolution.

Procedure. When an RCC Controller requests the USMCC controller to close an alert site in order to provide IHDB feedback in a timely manner, the USMCC Controller will ask the RCC Controller to ensure that the 406 MHz beacon has been secured and turned off. Prior to closing the site, the USMCC Controller will wait until there is a missed LEO pass or 20 minutes for expected GEO data, in order to verify

that the beacon is no longer transmitting. This verification serves to prevent the RCC from having to respond to a second alert site, including providing additional feedback in the IHDB, since a new alert site would be opened if alert data is received for a beacon after the first site is closed.

### USMCC Process for Alert Message Suppression

Background. The USMCC Controller can suppress alert messages to an RCC for an alert site, when the RCC knows that the SAR (distress or non-distress) case has been resolved and the beacon cannot be turned off.

Procedure. When an RCC Controller requests the USMCC Controller to suppress messages for an alert site, the request must be accompanied by an e-mail to [usmcc@noaa.gov](mailto:usmcc@noaa.gov) stating the reason for suppression. The USMCC Controller (in consultation with the USMCC Chief, as needed) will review the stated reason, to ensure that message suppression will not lead to a failure to respond to an unresolved distress. The USMCC Controller will notify the RCC Controller whether or not the request for suppression will be fulfilled. After the USMCC Controller changes USMCC configuration to suppress alert messages, the RCC will receive no further messages for the alert site, including site closure messages. Since the RCC will not be notified when the site closes, message suppression will make it more difficult for the RCC to provide timely feedback in the IHDB.

## Welcome to SARSAT!



CAPT Peter Martin, USCG

**Captain Peter F. Martin** is the Chief, USCG Office of SAR. He received his commission in 1990 following conclusion of his academic career at the State University of New York College at Oswego where he was awarded Bachelor of Arts degrees in Public Justice and Political Science and concurrently satisfied requirements for a minor in Forensic Science.

Captain Martin accumulated considerable maritime law enforcement experience and sea-going time during his career. His role as a command center controller at Greater Antilles Section, allowed him to develop expertise in maritime search and rescue while also prosecuting the counter-drug and alien migrant interdiction missions in the eastern Caribbean. He was awarded a Certificate in Accounting from the University of Washington's School of Business in 2000 and subsequently earned a master's degree from the University of Washington's School of Marine Affairs the following year.

Captain Martin served with distinction during assignment to the Department of State as Coast Guard Liaison to the Office of Marine Conservation, where he was involved in international negotiations and a variety of fisheries enforcement matters. During his subsequent assignment as operations officer at Group Woods Hole, MA he was directly involved in the post-9/11 evolution of the maritime homeland security mission and continued to accumulate experience in maritime search and rescue. Most recently, Captain Martin was Deputy Sector Commander at Sector St. Petersburg, FL.

The SARSAT Program is excited to have CAPT Martin as part of the team to support the USCG search and rescue system.



Dr. Lisa Mazzuca, NASA

**Dr. Lisa Mazzuca** is the NASA Search and Rescue Deputy Mission Manager. She began her career at Goddard Space Flight Center in 1991 as a Flight Dynamics engineer, where she developed and coded mathematical specifications related to spacecraft orbit trajectories.

She received a master's degree in Astrophysics from Johns Hopkins University in 1997 and soon after joined the Hubble Space Telescope (HST) Project to become the HST Operations Instruments Manager. Dr. Mazzuca led multiple large-scale instrument anomaly boards, one of which was instrumental to the first ever on-orbit instrument repair by astronauts. During her tenure with HST, Dr. Mazzuca handled the identification and resolution of multiple spacecraft anomalies.

Dr. Mazzuca accepted the position of Operations Integration and Test Manager for the Servicing Mission 4 Program in 2005, guiding the operations ground test program for the new and repaired instruments as well as the communications to HST via the Space Shuttle Atlantis. She led the successful completion of the large-scale Servicing Mission Ground Testing (SMGT) program, and the HST communications and interface testing with the Orbiter.

In 2006, she received a doctorate in Astronomy from the University of Maryland. Her scientific focus is in optical spectroscopy and imaging of the nuclear regions of galaxies, including circumnuclear rings and starburst regions. Outside of NASA, Lisa is a Captain in the Baltimore County Police Auxiliary Unit, and has been a member of the Aviation and Marine units since 1994. Part of her mission in both units is Search

and Rescue, and she is a certified aviation hoist operator and thermographer.



LTJG Tim Sinuefield, NOAA

NOAA SARSAT welcomes **LTJG Tim Sinuefield** to the team as the Operations Support Officer. LTJG Sinuefield is from Clinton, Mississippi and holds a B.S. in biology from the University of Southern Mississippi. After college, he spent 7 years in the Coast Guard stationed in Alaska, California, and South Carolina. In 2008 he joined NOAA and has spent four years on ship assignments in Seattle, WA and Pascagoula, MS. This is his first shore assignment with NOAA Corps. His general responsibilities include Special Program management and SARSAT outreach initiatives; however, he looks forward to supporting all aspects of the SARSAT mission.