The SARSAT Beacon

Volume 3, Issue 1

Taking the "Search" Out of Search and Rescue

October 2013

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

Two years ago, we began providing the Rescue Coordination Center community with an annual newsletter "The SARSAT Beacon" and this edition is our third. Each one builds upon previous editions to increase your familiarity with program and all of the newsletters are posted on both the USCG and SARSAT websites. With this 3rd edition, I'd like to update you on some changes that have happened within the past year and some challenges that lie ahead.

First of all, there have been some changes at the USMCC. I would like to welcome Earth Resources Technology (ERT) to the SARSAT team. Their firm was recently awarded the contract for operating the USMCC and has been on the job now for the past 6 months. Most USMCC personnel from the prior contract were retained so you should expect the same level of service and expertise.

Secondly, there is a lot of anticipation concerning the MEOSAR system and the benefits it will bring. Plans for MEOSAR are on schedule with initial operational capability planned for 2016. We are currently in the middle of the Demonstration and Evaluation phase using first generation beacons. At the start of next calendar year we should move to Technical Evaluations and Testing and then operational tests in which the RCCs will play a role. We expect 2nd generation beacons a bit further down the road in 2017.

Also, this past year we saw increasing budget cuts and of course the dreaded "sequestration." The current budget environment has been hard on all SARSAT partners and looks like it will continue into subsequent fiscal years. In response, travel and outreach activities have contracted considerably. It is more important now than ever to make the most of our interaction with the public and beacon owners to stress registrations and proper maintenance and disposal of beacons.

Finally, I'd like to congratulate all the SARSAT partners on a job well done. There have been over 180 people saved using SARSAT beacons in the past year. We recognize the great courage and commitment of our Search and Rescue partners that go out and make those rescues happen. I hope you enjoy this edition of "The SARSAT Beacon".

SARSAT Rescue 406! Game Application Released on iTunes

A distress call from an emergency beacon goes off somewhere in the world. Satellites orbiting high above Earth receive the signal and relay the person's location to search and rescue crews on the ground.

In SciJinks' new mobile game, Rescue 406, you will use the information from these satellites to direct the rescue effort. You'll need to be quick to keep up with an increasing number of people in trouble! Download it today at the Apple iTunes store. SciJinks is a joint NOAA and NASA educational website about weather and other Earth science topics. It targets middle- and high-school aged students.

Inside this issue:

USMCC Backup Scenarios and RCC Expectations

When the USMCC is unable to receive and send alert messages, it will exercise appropriate backup procedures. Depending on the failure, the USMCC will follow one or a combination of the following procedures:

1. Transfer processing to a backup system at its primary site at the NOAA Satellite Operations Facility
2. Move operations to the USMCC backup site at Wallops, Command Data Acquisition Station, Wallops, VA
3. Request the Canadian MCC (CMCC) assume USMCC responsibilities and send alert messages to the US RCCs

The first case should be transparent to the US RCCs, except for a possible short delay in sending messages that are received during the transition.

The second and third cases will be used if the USMCC is expected to be down for more than 30 minutes. This does not give much time to analyze and take corrective action(s). Each of these will impact the US RCCs and their normal operations.

These backup plans seldom get exercised due to actual failures; therefore simulated failures are used to exercise the backup plans.

The second case will cause the alert sites to reopen, the alert site numbers to change, and will make previous pass information for an open site unavailable. RCC controllers will need to correlate data from the Primary USMCC and the backup USMCC by beacon IDs instead of from alert site numbers. Alert sites that open and close with the Backup USMCC will not be transferred to the IHDB, but sites that were already opened with the Primary USMCC will close and be added to the IHDB after the Primary USMCC resumes normal operations. Here too, RCC controllers will also need to correlate information by the beacon ID, not the alert site number.

The third case is used when neither the Primary USMCC nor the Backup USMCC is available – a situation that has never occurred. In this case, the CMCC takes over and distributes alert messages to US RCCs in the subject indicator type (SIT) 185 formats, which are explained in the *USMCC National Rescue Coordination Center and Search and Rescue Point of Contact Alert and Support Messages* Version 2.00 - 1 May, 2013 (see http://www.sarsat.noaa.gov/documentation.html). The SIT 185 is an internationally agreed-upon format used by all MCCs to send alert messages to their SAR Points of Contact (SPOCs). As with the previous cases, the alert site numbers will change and RCC controllers will have to link data from the USMCC and CMCC by beacon ID.

The third case is most likely to be used to provide a transition of the Primary USMCC to the Backup USMCC and give the USMCC time to deploy its personnel to the backup USMCC site at Wallops. However, this option should seldom be needed because the backup USMCC at Wallops can be remotely operated by USMCC controllers at the Primary USMCC site at NSOF or from the remote site at the NOAA Center for Weather and Climate Prediction (NCWCP) in College Park, MD.

The third case is also exercised to insure that procedures at the CMCC are current and that US RCC controllers are knowledgeable of the SIT 185 message format and capable of conducting SAR from it.

In the second or third case, the registration database (RGDB) may not be available. For instance, if power is down at NSOF, the RGDB will be off, but in the cases of COOP exercises, the RGDB may still be available. In all cases where RCCs are receiving alert messages from the CMCC, the CMCC will not have registration information or have access to the RGDB. During COOP exercises, RCCs should be able to log into the RGDB and check for beacon registration information (note that the query portion of the RGDB screen should have "Beacon Status" set to "All" and "All").

Finally, the third case is exercised to satisfy an annual C-S requirement for each MCC to conduct an exercise with its backup MCC.

Final words on the third case:

- When it is used, the CMCC sends a message to all US RCCs informing them that it has taken over the national responsibilities of the USMCC. That message tells the RCCs what to expect and asks for an acknowledgment from each RCC. It is important that RCCs acknowledge ASAP so the CMCC does not have to follow up; CMCC personnel are busy ensuring that everything is working as expected.
- Contingency wise this is the worst case scenario, but exercising it provides proper preparedness.

Final words on the USMCC backup exercises in general:

- The exercises are usually executed with no advance notice to RCC controllers; instead they are coordinated with "headquarters"
- RCCs are notified approximately one hour in advance of an exercise to determine if they have any on-going SAR cases that will be impacted.

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Defining a Second Generation Beacon

The International Cospas-Sarsat Programme[1] began developing Second Generation Beacons in 2010 with an Expert's Working Group focused on defining the operational requirements. Over the next 2 years, experts from the Search and Rescue community and Rescue Coordination Centers submitted papers and proposals on what a Second Generation Beacon (SGB) ought to do in order to save more lives.

The operational requirements were broken up into two different categories; minimal requirements which must be met by every 406 Mhz beacon that is to receive Type Approval, and objective requirements which are desirable in only certain applications. Acceptance of the operational requirements in Cospas-Sarsat document G.008[2] set the benchmark for what a SGB would be. The requirements ranged in scope from increased independent (non-GPS encoded) location accuracy to verification of beacon registration and increased beacon message requirements. The full list of requirements can be found in G.008. It was now left for the technical experts to determine the best SGB design to meet these requirements.

Two distinct designs have emerged. One design uses essentially the same waveform as in today's beacons with some tweaks to allow for slightly better location accuracy. Encoding of data into the beacon is also modified creating a longer beacon message, albeit at a cost to beacon battery consumption. In order to offset the longer message, this narrowband approach, as it is currently being referred to, proposes an intelligent beacon transmission scheme.

An intelligent transmission scheme, which is actually an idea shared between the two prevailing designs, seeks to decrease total power needed by varying the time between beacon transmissions at different phases after beacon activation. The details are still undefined, but essentially there will be more frequent transmissions immediately after beacon activation to increase the likelihood of detection and location accuracy. As the time after activation grows, the beacon will begin to transmit at more infrequent intervals, thus conserving battery while still providing location updates.

The second design, developed primarily by NASA's SARLAB[3] in conjunction with beacon experts from France, proposes to utilize this intelligent transmission scheme along with a spread spectrum waveform to actually reduce battery capacity and size from today's beacons. These reductions are possible by using the same data transmission technology that is employed in many cell phones and satellite communications networks today. The technique of spreading data across a spectrum using predefined codes has many other benefits besides reduced power. This would also allow a beacon transmission to be more resilient to most common interferers (including other beacons) and could even allow some beacons to use undistributed codes, making them practically undetectable to anyone who did not have access to the codes.

Amazingly, the use of a spread spectrum signal within the new MEOSAR space segment will also allow for greater independent location accuracy. This is because the spread spectrum signal is inherently able to be more accurately time tagged, which the MEOSAR system relies on. Initial prototypes developed by the SARLAB have been able to achieve single burst location accuracy of less than 1 km, which more than meets the requirement defined in G.008. With a bit more tweaking, locations in the 100s of meters certainly seem possible.

The future of the Cospas-Sarsat system and in particular the Second Generation Beacons will be an exciting progression to watch. The Cospas-Sarsat Beacon Implementation Plan (document R.017) received significant updates recently. The task of seamlessly deploying a new generation of life saving beacons within an already existing international program is not one the Cospas-Sarsat community takes lightly. As such, Second Generation Beacons will likely be available on the market no earlier than 2018. The current timeline reflects the dedication to assuring all Second Generation Beacons meet the rigorous standards and trust users have in the Cospas-Sarsat System.

As the designs and timelines are becoming more and more defined, the benefits of Second Generation Beacons appear to be more in focus than ever. It won't be long before a smaller, lighter, more accurate, and hopefully cheaper beacon will be available for anyone to purchase.

[1] http://www.cospas-sarsat.org/

[2] http://www.cospas-sarsat.org/images/stories/SystemDocs/Current/CS_G008_OCT_2012.pdf

[3] http://searchandrescue.gsfc.nasa.gov/sarlab/

Want more information on the NOAA/SARSAT Program?
Visit us on the web at: www.sarsat.noaa.gov

Beacon Registration

In 2012, a record 37,237 new registrations were entered in NOAA's registration database (RGDB). As of July 31, 2013, the RGDB contained more than 388,000 registrations. The following table shows registrations by beacon type.

RGDB Registrations by Beacon Type

	EPIRB	ELT	PLB	SSAS	Total
New Registrations processed 2010	8,734	7,765	18,414	7	34,920
New Registrations processed 2011	7,843	8,286	16,913	1	33,043
New Registrations processed 2012	8,060	7,813	21,363	1	37,237
Total Registrations processed as of 07/31/13	192,022	69,722	126,495	251	388,490

The RGDB staff is available to assist beacon owners with registrations and related questions Monday through Friday, 7am to 6pm Eastern Time. NOAA's goal is to complete beacon registrations as quickly and accurately as possible. We are constantly striving to improve our procedures and staff training so we can provide the best possible registration data to SAR authorities. As always, owners can register new beacons or update existing registrations 24 hours a day, 7 days a week online at www.beaconregistration.noaa.gov.

Search and rescue (SAR) personnel are vital in helping us improve the accuracy of records in the RGDB. Please continue to provide us with specific updates (e.g., new owner phone numbers) to beacon registration information through the IHDB in addition to requesting the owner contact us. These comments are relayed to the RGDB staff, who follow up with the owner and update the RGDB.

Recent Changes to the RGDB

Additional two-year renewal reminder letters

To improve the currency and accuracy of the RGDB, NOAA now sends two additional reminder letters to beacon owners asking them to review their registration information. These additional letters have resulted in a 20% increase in owner response.

New database for military beacon registrations

Since 1990, NOAA's RGDB has been the single repository for all USA-coded beacon registration information used by SAR personnel. To address the special needs of Department of Defense (DoD) beacons, the Joint SARSAT Electronic Tracking System (JSETS) database was created. Any beacons owned and/or used by DoD must be registered only in the JSETS database. The JSETS can only be accessed from a ".mil" system. Since NOAA uses a ".gov" system, we have no access to the JSETS data. Keeping in mind that over 150,000 EPIRBs, ELTs, and PLBs are registered in the JSETS, NOAA recommends that all US RCCs establish user accounts with JSETS. As an alternative, contact the US Air Force RCC at 850-283-5955 to gain access to registration information for any beacons owned or operated by the DoD (usually listed in RGDB as "DoD," "used by the DoD," or "see JSETS" or listed on the alert as a DoD beacon). JSETS is now the only repository for DOD beacon registrations in accordance with DoD Instruction 3002.02, *Personnel Recovery and 406 MHz Search and Rescue (SAR) Emergency Beacons in the Department of Defense*, January 11, 2013.

RGDB Requirements Review

NOAA is currently in the requirements-gathering phase for enhancements to the RGDB. One of the aims of this effort is to improve the experience for both beacon owners and the Rescue Coordination Centers (RCCs). We hope to further encourage beacon owners to register online and leverage technology to improve the quality of data already in the RGDB.

Have an idea for a future article in The SARSAT Beacon? Please direct suggestions/comments to: Stephen.Roark@noaa.gov

Maximizing the Value of SAR User Accounts

Controllers at RCCs with SAR User Accounts have access to a large store of data that can help speed up rescue decisions and prevent launching assets to false alerts. This data is housed in the RGDB and Incident History Database (IHDB). Learning how to maximize these two repositories can result in greater search success, efficiency, and reduced costs.

When a controller first joins an RCC, a SAR account request is sent to the appropriate US Coast Guard or US Air Force SARSAT liaison:

The liaison provides that information to the US Mission Control Center (USMCC) registration staff for account creation. Once the login(s) and temporary password(s) are sent back to the user through the liaison officer, the SAR user can log in and search the RGDB and IHDB and enter feedback information into the IHDB records. SAR users who get locked out of the system should contact the USMCC Controller at 301-817-4576 for assistance; they should NOT contact the liaison or beacon registration staff.

The following tips will help improve RGDB search success:

- When searching, make sure to select "All" for both boxes in **Beacon Status,** otherwise special-status beacons (e.g., sold) will not be displayed.
- The best field to search on is **Beacon ID** since that is the primary field and is unique to each beacon. A hit on the beacon ID guarantees that the owner/operator information is displayed. (See example 1.)
- You can also search records by **Vessel Name**, **Owner's Name**, or **Registration Number** (National or State). Adding more than one criterion to your search improves the chances of retrieving the correct beacon records, especially when dealing with a common owner name. (See example 2.)
- Use the wildcard character "*" (asterisk) when only partial information is known or you are unsure of a spelling. The "*" replaces the unknown character(s) in a field. (See example 3.)
- Due to the increase of online registrations, the old rule of avoiding punctuation is becoming less valid. This makes structuring your query even more important.
- Use search variants when the exact term does not return any hits or returns multiple or unrelated registrations. (See example 4.)

Example 1 - UIN (Beacon ID)
Key in the **Beacon ID** (UIN) and select the "Search" button. If the beacon is registered, you will see the registration appear. If not, it means that the UIN is not registered.

Example 2 - Multiple Fields
If the boat name and the last name of the owner are known, search on **Owner's Name** "Smith John" (last name first) and **Vessel Name** "Seastar". In this example, a more discreet set of IDs are identified for any beacons owned by "Smith John".

Example 3 - Wildcard Character (*)
As in example 2, the owner and vessel names are known, but the previous search does not give any hits. By adding the wildcard character to the beginning and/or end of both fields:
Owner's Name "Smith*Jo*n" and **Vessel Name** "*Sea*Star*" will allow for alternate spellings, middle names/initials, and spaces.

Example 4 - Search Variants
Using the same criteria as in examples 2 and 3, perhaps **Owner's Name** was originally registered with first name as the last name so entering "John Smith" would yield the correct registration.

Using the Incident History Database (IHDB)

The IHDB is a record of all beacon activations (USA and non-USA coded) in the USA Search and Rescue Region. NOAA administers the database which is used extensively for a variety of purposes by NOAA, USCG, USAF and NASA. The completeness and accuracy of the information is therefore important for all users (e.g., false alert categorization is used to reduce future false alert responses and for improvements in beacon design).

Part of the responsibility of the RCC Controller is to update the IHDB with details of beacon activation incidents. The USMCC Duty Controller is responsible for assuring that the IHDB records are filled out as accurately as possible. The Controller on duty reviews the records in the IHDB hourly while on shift. If a record has not been filled out after a site has closed they send a reminder to the RCC that worked the case. An RCC Controller may also receive a call from the USMCC to clarify information or for an explanation of inconsistencies such as:

- Match between "Reason Activated" and any comments (e.g., reason: "accidental activation" and comment: "no further information")
- Explanation for large number of passes for a ceased/undetermined event.
- Inconsistent comments (e.g., comment states that RCC talked to the owner but owner information marked "Unverified")

A detailed explanation of how to categorize a false alert can be found by clicking the link Examples of Operational False Alerts on the IHDB record. These categories are defined by the Cospas-Sarsat Program. Presently we know that there is not a category for when a beacon activates correctly but no person is in distress. We have decided that these activation should be marked as 'False Alert-Environmental Conditions' (e.g. a vessel sinks at the dock with no one on board - not a true distress situation)

The USMCC creates a timeline for distress events including specific details on the activation. This timeline will determine if a distress case is reported as a "SARSAT SAVE". Key elements such as what was the mechanism of first notification (e.g., UMIB, cell phone, beacon) are essential. Even if the beacon was not the first alert, knowing if the SARSAT location from the beacon activation was used to find the persons involved is equally important.

Frequently Asked Questions

Q. What should I do when the NOAA decal is missing on an emergency locator transmitter (ELT)?

A. NOAA no longer issues decals for ELTs. Inspectors and other authorities should request the registration paperwork from the owner/operator to verify ELT registration.

Q. The beacon's unique identification number (UIN) on the NOAA decal does not match the manufacturer's UIN. Does that mean the beacon is registered incorrectly?

A. Not necessarily, it could be that the owner has multiple beacons and applied the wrong decal to that beacon. To resolve this issue, just ask the owner/operator if they have other beacons. Regardless of the reason for the discrepancy, the owner should always contact beacon staff to resolve the issue. This is a good example of why you should always be sure to look at both the NOAA decal and the manufacturer label.

Q. How are registrations with foreign addresses or homeports reported in an alert?

A. If an owner provides a registration with missing or non-US homeport or city information (ELTs and EPIRBs), the RGDB is not able to associate an RCC with the beacon. As a result, a SAR code of "0000" is automatically assigned to the registration. This means that the first alert is transmitted to LANTAREA and PACAREA RCCs. Once the location is resolved, however, future alerts are transmitted to the correct RCC.

Q. What if I call a registration contact and only get a voicemail? Does that mean the registration is bad?

A. No, having the ability to leave a voicemail message is a good indication that the registration information is still valid. It is standard practice for the RGDB staff to leave a message then call any additional numbers in the registration until someone answers or there are no more avenues of contact. In a SAR scenario, it is important to leave a message and continue as though the contact information is valid.

Q. What's the advantage of linking sites in the IHDB?

A. Linking sites in the IHDB eliminates double counting of distress cases where two or more beacons are activated for the same SAR case. For example, a vessel is sinking and has 3 people on board. The vessel's EPIRB activates automatically and a person on board activates their PLB. We would link these sites so the three people would only be counted once. Sites where the same beacon is activated again and for the same reason should not be linked – each beacon activation in these circumstances is considered a separate event.

Q. What is the International Registration Database (IBRD)

A. The IBRD (www.406registration.com) is a registration database administered by the Cospas-Sarsat program to support countries that choose not to maintain their own beacon registration or perhaps have their own registration but are not available 24 hours per day. The beacon owner may upload directly into the IBRD or the National Data Provider may collect the registration information and periodically upload the data to the IBRD to make the registration information available to SAR services. The IBRD supports EPIRB and ELT registrations as well as PLBs if allowed by the country of registry. Ship Security Alert System (SSAS) beacons are not supported. Currently there are 111 countries specifically designated for IBRD support and documented in C/S D.004 and the main page of the website under "Supported Countries". Countries of registry not listed cannot be entered into the IBRD.

Additional Resources

- Our SARSAT website has been updated but additional suggestions are always welcome. Please visit the SARSAT website at www.sarsat.noaa.gov and if you have ideas for improving the website please submit your suggestions to 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

- 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

- 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.

- 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.

- To access the USMCC National Rescue Coordination Center and Search and Rescue Point of Contact Alert and Support Messages Version 2.00 - 1 May, 2013, please go to: http://www.sarsat.noaa.gov/rccmsgsv200.pdf

- Following are links to the available SAR training opportunities

◊ Maritime SAR Courses: www.uscg.mil/tcyorktown/Ops/SAR/default.asp

◊ Inland SAR Courses: http://www.uscg.mil/tcyorktown/Ops/SAR/Inland/default.asp

◊ AFRCC's Basic Inland SAR Course: 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/

Welcome to SARSAT!


LtCol Ian W. Kemp

Lieutenant Colonel Ian W. Kemp is the commander of the Air Force Rescue Coordination Center (AFRCC), 1st Air Force, Tyndall AFB, Florida. He leads a diverse team of active-duty, reserve, and civilian personnel responsible to the Inland Search and Rescue Coordinator for routine, civil search and rescue coordination across the continental United States. This continuous (24/7) responsibility extends, via international agreement, to the land borders shared with the nations of Canada and Mexico. The AFRCC coordinates with local, state, and federal entities to provide search and rescue response to protect life and prevent undue suffering of individuals or groups of individuals in accordance with national and international treaties and agreements.

Lieutenant Commander Aaron Ortenzio recently reported to the USCG Office of Search and Rescue assuming the role of USCG SARSAT Liaison Officer. He received his commission in 2000 upon graduation from the United States Coast Guard Academy with a Bachelor of Science in Government. From 2000-2002 LCDR Ortenzio served as a Deck Watch Officer aboard USCGC ACUSHNENT home ported in Ketchikan, AK. Following his sea tour, LCDR Ortenzio attended U.S. Naval Flight Training earning his wings in February 2004. LCDR Ortenzio flew the HU-25 Falcon Jet as part of the Operations Division at U.S. Coast Guard Aviation Training Center, Mobile, AL from 2004-2008. In 2008, LCDR Ortenzio attended the United States Navy Aviation Safety Officer School and became the fixed wing Safety Officer at USCG Air Station Miami where he continued to fly the HU25 until 2010 amassing over 2,500 flight hours in the jet. In 2010 LCDR Ortenzio transitioned to the Coast Guard's newest aircraft, the HC144 Ocean Sentry logging nearly 1,000 hours. He was awarded a Master's Degree in Aeronautical Science with a safety specialization from Embry Riddle Aeronautical University in 2011. The SARSAT Program is excited to have LCDR Ortenzio as part of the team to support the USCG search and rescue system.


LCDR Aaron Ortenzio

Mr. Edwin Thiedeman is the Coast Guard's new SARSAT Program Specialist in the USCG Headquarters Office of SAR. He was hired in July 2013 to fill the new SARSAT program position to provide technical and program management support to the SARSAT program.


Mr. Edwin Thiedeman

Mr. Thiedeman received a bachelor's degree in Electrical & Electronics Engineering from the United States Coast Guard Academy and a master's degree in Electrical & Electronics Engineering from Purdue University. During his 31 years as a commissioned officer, Mr. Thiedeman served at field units, the Maintenance and Logistics Command Atlantic, and at Headquarters managing, acquiring, and supporting a wide spectrum of C4ISR and navigation systems, including beacons and GPS. His last assignment was at the Coast Guard Navigation Center in Alexandria, Virginia where he served as the Deputy Chair for the Civil GPS Service Interface Committee, part of the Department of Transportation's program to respond to the needs of civil GPS users and integrate GPS into civil sector applications. He also served as a key member of the GPS Triad comprised of the USAF, FAA, and USCG and focused on providing uninterrupted precise positioning, navigation, and timing capabilities for maritime, land, and aviation users and as the DHS representative to the interagency team, sponsored by the Departments of Defense and Transportation and led by the National Security Space Office, in developing a National Positioning, Navigation, and Timing (PNT) Architecture substantially influencing future government- and commercially-provided PNT products and services.

Lieutenant Colonel James R. Woosley is the Director of Operations of the Air Force Rescue Coordination Center (AFRCC), 1st Air Force, Tyndall AFB, Florida. He leads a diverse team of active-duty, reserve, and civilian personnel responsible to the Inland Search and Rescue Coordinator for routine, civil search and rescue coordination across the continental United States. This continuous (24/7) responsibility extends, via international agreement, to the land borders shared with the nations of Canada and Mexico. The AFRCC coordinates with local, state, and federal entities to provide search and rescue response to protect life and prevent undue suffering of individuals or groups of individuals in accordance with national and international treaties and agreements.


LtCol James R. Woosley

Lieutenant Colonel Woosley is a 1998 graduate of The United States Air Force Academy. He has served in various operational and staff assignments in ACC, AFSOC, and HQ USAF. He has 10 deployments in support of Operations NORTHERN WATCH, ENDURING FREEDOM, IRAQI FREEDOM, AND ENDURING FREEDOM-HORN OF AFRICA. He is a senior pilot with more than 2, 7000 flying hours, 390 combat hours during Operation ENDURING FREEDOM, and Operation IRAQI FREEDOM. He also has over 200 hours flown during operations in the Horn of Africa.