United States

Search and Rescue Satellite Aided Tracking

(US SARSAT) Program

Policy on Non-Distress Transmissions

of 406 MHz Beacons

13 June 2018

Version 1.2

Change History

Version	Revision	Change Description	Date
1	.0	Original Document	13 December 2011
1	.1	Updated and Approved	16 July 2013
1	.2	Updated and Approved	13 June 2018

SARSAT Policy on Non-Distress Transmissions of 406 MHz Beacons

Title:

SARSAT Policy on Non-Distress Transmissions of 406 MHz Beacons

Effective Date:

Upon approval by the Program Steering Group

Purpose:

To establish SARSAT Program policy on testing, training, and exercising with emergency beacons, survival radios, and Direction Finding/Homing equipment that transmit and/or receive on the 406.0-406.1 MHz frequency band.

Applicability:

This policy applies to all non-distress transmissions from 406 MHz emergency beacons and survival radios within the United States Search and Rescue Region consisting of the CONUS, Alaska, Hawaii, and waters over which the United States has jurisdiction. These include self-test transmissions, test-coded and operationally coded transmissions from beacons used for training, tests, and exercises. This policy does not cover transmissions in the 121.5/243 MHz channels.

Background:

In the United States, the use of frequency spectrum is governed by the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA). The NTIA manages the Federal Government's use of the spectrum while the FCC manages all other uses. The Communications Act of 1934 provides for the functions of developing classes of radio service, allocating frequency bands to the various services, and authorizing frequency use. However, the Act does not mandate specific allocations of frequency bands for exclusive Federal or non-federal use; all such allocations stem from agreements between the NTIA and the FCC.

The Act preserves for the President the authority to assign frequencies to all Federal Government owned or operated radio stations. The Interdepartment Radio Advisory Committee (IRAC) advises the NTIA on frequency spectrum issues. The relationship between the NTIA and the FCC is illustrated in Appendix A.

The FCC and NTIA manage frequency allocation in the United States and coordinate these uses internationally at the International Telecommunication Union (ITU). The table of frequency allocation states the following for the use of 406.0 to 406.1 MHz:

> **5.266** The use of the band 406-406.1 MHz by the mobile-satellite service is limited to low-power satellite emergency position-indicating radio beacons (see also Article 31). (WRC-07)
>
> **5.267** Any emission capable of causing harmful interference to the authorized use of the frequency band 406-406.1 MHz is prohibited.

SARSAT Policy on Non-Distress Transmissions of 406 MHz Beacons

Relevant Policy Drivers:

- The Communications Act of 1934, as amended
- The ITU Radio Regulations
- Manual of Regulation and Procedure for Federal Frequency Management, NTIA
- Code of Federal Regulations, Title 47, Parts 80, 87 and 95
- Cospas-Sarsat Data Distribution Plan, C/S A.001

Policy:

Definitions

- Beacon Self-Test or Built-in Test – activation of an emergency beacon according to manufacturer's instructions to ***internally*** test the beacon unit and assure its operation. Specific self-test procedures are different for each beacon and are contained in manufacturer instruction sheets.
- Installation Testing – activation of an emergency locator transmitter according to manufacturer's instructions and Federal agency requirements to ensure proper installation of the beacon and its components.
- Training or Exercise – a maneuver or simulated operation involving planning, preparation, and execution that is carried out for the purpose of training and evaluation of Search and Rescue (SAR) response that may involve activation of an emergency beacon to exercise the response of the end-to-end capability of the system.
- Confidence Testing – activation of any emergency beacon simply to verify it will activate and function within the system.

General Policy

The 406.0-406.1 MHz band is set aside for mobile satellite earth-to-space transmissions at both the national and international levels. The use of the 406.0-406.1 MHz frequency band by a mobile-satellite service is limited to low-power satellite emergency radio beacons and any emission capable of causing harmful interference to authorized uses of the band is prohibited.

Confidence testing of any beacon is an inappropriate use of the system, may cause unnecessary alerts to be generated, may place rescue crews at unnecessary risk, and is strictly forbidden.

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Beacons coded with operational protocols should not be used for tests, except on rare occasions when required by and under control of a national administration, or for international exercises coordinated by the Cospas-Sarsat Joint Committee. All Mission Control Centers (MCCs) shall be notified of tests using beacons coded with operational protocols, in accordance with the procedure described in Annex II/C of the DDP. Tests using beacons coded with the Test User Protocol may be performed by anyone having coordinated the test with, and received approval from, the responsible MCC. Coordination with affected MCCs should be performed by the responsible MCC in accordance with the procedure described in Annex II/C of the DDP.

Beacons using operational coding require an additional level of coordination with our international partners. Test/training requests using operational beacons must be submitted according to the following deadlines:

Using 1-3 Beacons – 48 hours (2 business days) before the first event
Using 4-6 beacons – 30 days before the first event
Using 7+ beacons – Testing/training not allowed

Furthermore, Title 47 (parts 80, 87 and 95) of the Code of Federal Regulations limits the use of emergency beacons to situations of grave and imminent danger.

The SARSAT Program monitors the frequency for unauthorized use and reports interference regularly to the FCC for prosecution.

<u>Classifications of Beacon Burst Types</u>

Activations generally fall into one of three categories:

1) *Self-Test or Built-in Test Transmission* – an on-air transmission where the frame synch is reversed so that the Cospas-Sarsat space and ground segments do not normally process the beacon burst. Note: The ground segment can be configured to process this transmission, which is relayed through satellites that carry a 406 MHz SAR repeater.

2) *Test Protocol Transmission* – an on-air transmission where the coding of the beacon is modified so that the Cospas-Sarsat space segment recognizes it as a test transmission and does not forward it through the operational ground segment.

3) *Operational Protocol Transmission* – an on-air transmission where the coding of the beacon corresponds to a distress alert and the resulting alert is treated as if it were an actual distress. Note: This could result in the launch of SAR assets.

Exceptions to the General Policy

While the NTIA and the FCC manage their respective constituents' uses of the spectrum, both must keep in mind the overall best interests of the public and the Government. To that extent, the SARSAT program recognizes the need for activation of emergency beacons or other devices in the band to support self-tests, training, testing, and exercise requirements.

Transmission by Individual Beacon Owners or Beacon Manufacturers or Service Stations

Transmissions in the 406.0-406.1 MHz band by individuals or non-SAR responders (e.g., private individuals, beacon manufacturers, beacon installers, commercial interests, vessel/aircraft inspectors) are limited to activations in the self-test mode, inside a shielded box, or inside an anechoic chamber. Activations in the self-test mode should be conducted per the beacon manufacturer's instructions. Prior coordination is not required for these scenarios. The policy for activation by non-SAR responders is described below and in Appendixes B and C.

Beacon Self-Test/ Built-In Test Transmission: No prior coordination is necessary. Activations in the self-test mode should be conducted per the beacon manufacturer's instructions.

Installation Testing: Activation of the operational protocol transmission is permitted when done within a shielded box or anechoic chamber in such a way that no transmission is able to be received by the operational system. Transmissions outside an anechoic chamber should only use the self-test function and a hand-held local test verification unit. No prior coordination is necessary.

As an alternative, there are commercial entities that operate fee-for-service testing alternatives via web sites which allows 406 MHz beacon testing by receiving the beacon message from the self-test function to support annual inspections and initial installations.

If an actual beacon activation occurs, beacon owners should immediately notify the USAF or USCG SAR Responders as appropriate, and also replace their batteries per manufacturer's recommendations.

Confidence testing of any beacon is an inappropriate use of the system, may cause unnecessary alerts to be generated, may place rescue crews at unnecessary risk, and is strictly forbidden.

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Transmission by SAR Responders

Transmissions in the 406.0-406.1 MHz band by SAR Responders (e.g., USCG, USAF, other service or DOD entities, Civil Air Patrol, State, Local, Tribal or Territorial, other Federal response agencies) should be coordinated with the National Oceanic and Atmospheric Administration (NOAA) SARSAT program. In general, non-distress transmissions are discouraged as they saturate the Cospas-Sarsat space segment and increase the workload for the U.S. Mission Control Center (USMCC) and Rescue Coordination Center (RCC) staff and may cause an actual distress alert to be missed by the system. If a test cannot be performed in an anechoic chamber and an exercise or field training is required, the NOAA SARSAT program must coordinate the transmission with the Cospas-Sarsat System and can provide additional assistance as required (e.g., distributing the distress alert to a particular site). The SARSAT program will not participate in any test, demonstration, or exercise whose purpose is to promote the sale of beacons or services. The policy on each type of activation is described below and in Appendixes B and C.

Beacon Self-Test/ Built-In Test Transmission: No prior coordination is necessary. Activations in the self-test mode should be conducted per the beacon manufacturer's instructions.

Operational Training or Exercises: Must be coordinated with NOAA, through USCG and/or USAF Program POCs according to SARSAT and Cospas-Sarsat procedures. Transmission should generally be limited to the test protocol, but the operational protocol can be supported in limited cases.

Confidence testing of any beacon is an inappropriate use of the system, may cause unnecessary alerts to be generated, may place rescue crews at unnecessary risk, and is strictly forbidden.

Important

Any radio transmission in the United States is governed by the FCC and the NTIA. The SARSAT Program cannot authorize any transmission. The policy and guidance stated here reflects what has been coordinated with the FCC and agreed to by the SARSAT Program Steering Group, composed of personnel from NOAA, the National Aeronautics and Space Administration, the USAF, and the USCG.

Implementation

The SARSAT Operations Lead will develop and maintain the appropriate standard operating procedures to implement this policy and relevant international procedures.

Roles and Responsibilities

The Program Steering Group shall be responsible for maintaining and updating this policy. NOAA shall be responsible for implementing this policy and providing status information to the Program Steering Group.

The USAF Program POC will be responsible for coordinating all USAF, other uniformed services, Civil Air Patrol, state, test, training, and exercise requests, including Rescue Center coordination, if required.

USAF Program POC: Air Force Rescue Coordination Center (AFRCC)
Email: AFRCC.Console@us.af.mil
Phone: DSN 523-5955, commercial 850-283-5955

The USCG Program POC will be responsible for coordinating all USCG and USCG Auxiliary test, training, and exercise requests, including Rescue Center coordination, if required.

USCG Program POC: HQ USCG CG-534 Office of Search and Rescue
Email: HQS-DG-M-406-TEST-Request@uscg.mil
Phone: 202-372-2089

The NOAA Program POC will be responsible for coordinating all other requests for test, training, and exercise.

NOAA Program POC: NOAA–SARSAT Program
Email: beacon.test@noaa.gov
Phone: 301-817-4120

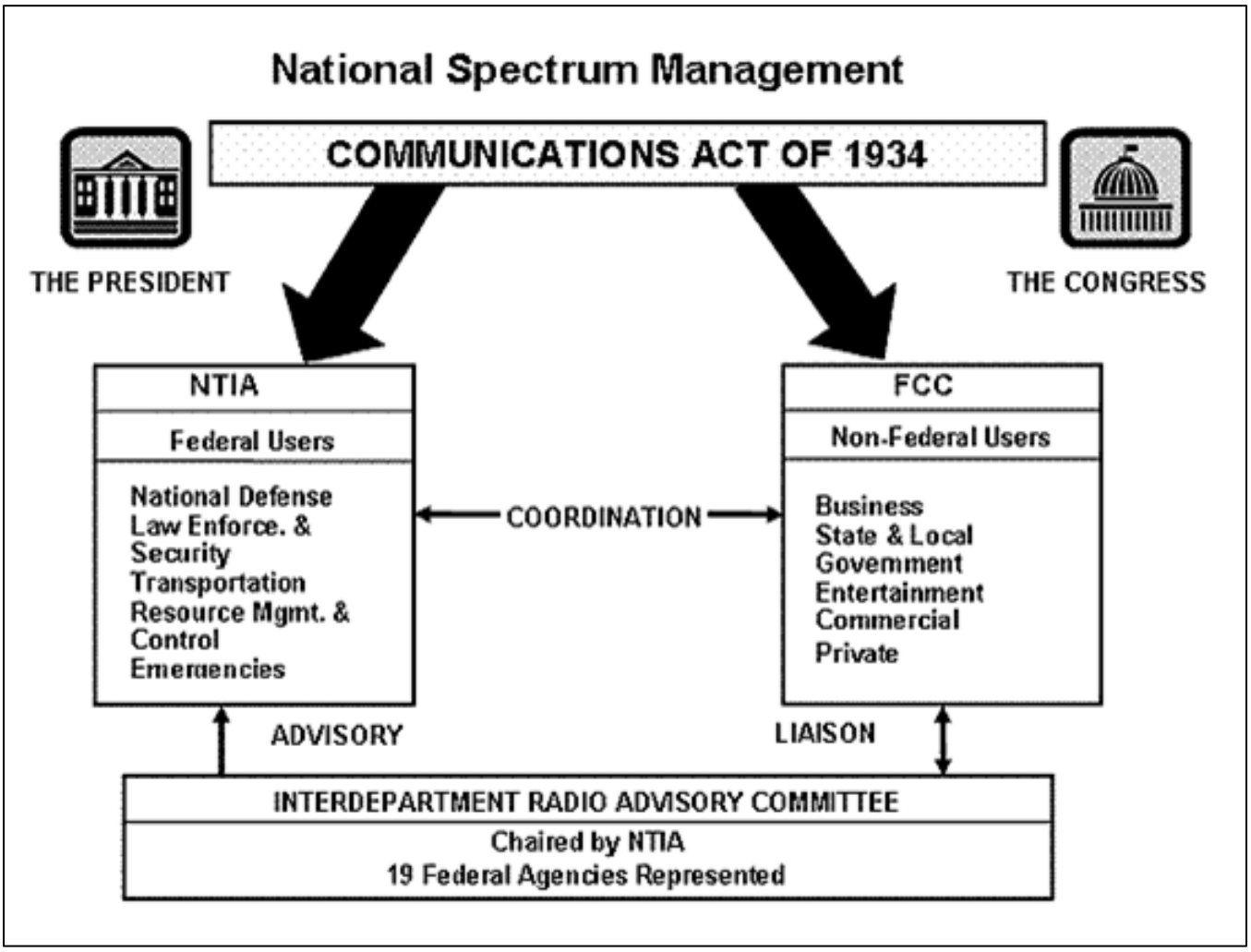
Agencies desiring to conduct a test, training, or exercise shall forward a test request through the appropriate program POC to NOAA. The 406 MHz Emergency Beacon Test Request form is available on the "Beacon Testing" page of the SARSAT website (www.sarsat.noaa.gov).

Within NOAA, test requests shall be cleared by the Chief of the USMCC and the SARSAT USMCC System Manager after appropriate coordination with the USAF or USCG Program POCs and Rescue Coordination Centers, if required.

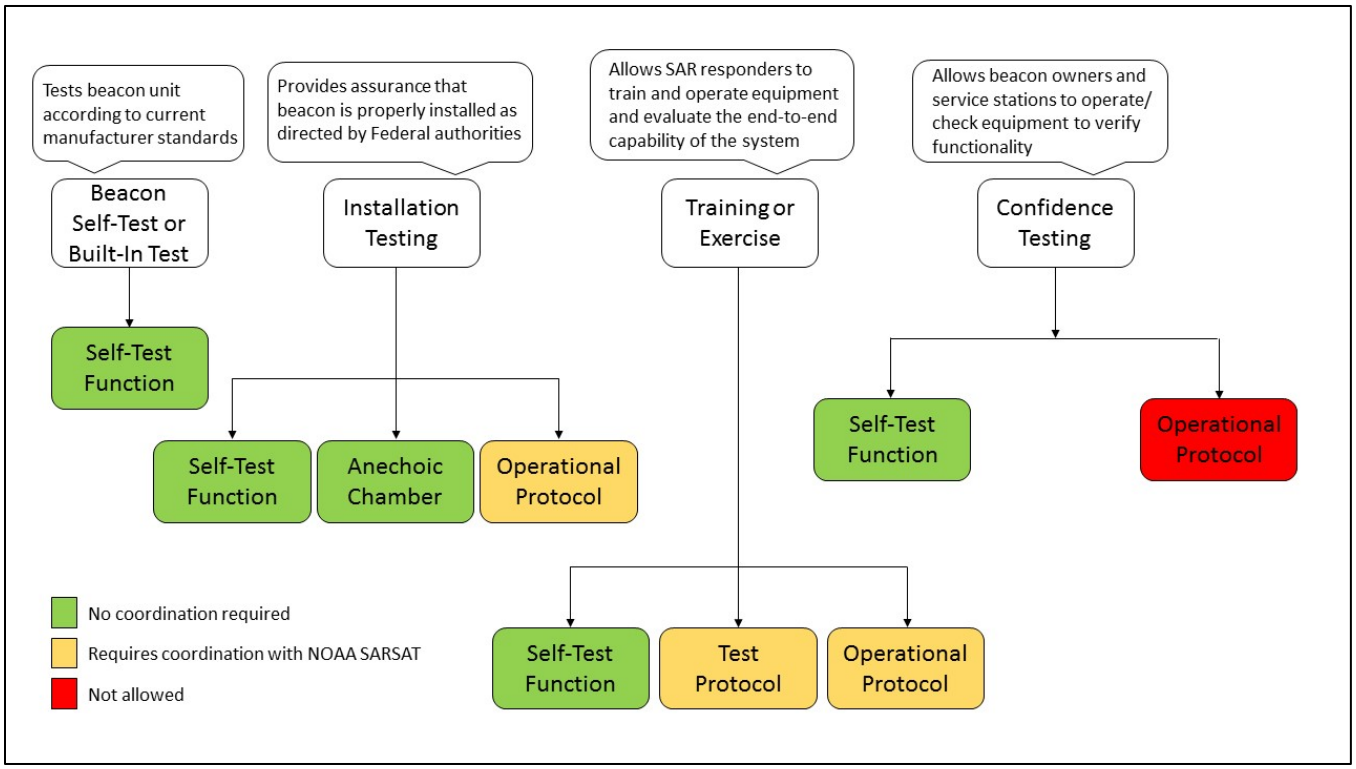
Approved By:

SARSAT Program Steering Group on 13 June 2018

Appendix A – National Spectrum Management



Appendix B – SARSAT 406 MHz Emergency Beacon Testing/Training Activation Policy Diagram



For US-coded beacon activations outside the United States SRR, coordinate with the government responsible for the SRR the beacon will be activated in, and also notify NOAA using the Beacon Test Request form (Appendix D).

Appendix C - U.S. Search and Rescue Satellite Aided Tracking (SARSAT) Interagency Program Steering Group (PSG) Joint Policy Statement

Title: U.S. 406 MHz Training Beacon Policy

Effective Date: 1 June 2007

Purpose: This policy applies to the production, modification, and use of 406 MHz beacons for training purposes by search and rescue (SAR) agencies of the Federal government.

Background: The proliferation of 406 MHz beacons within the United States amongst the maritime, aviation, military, and recreational user communities has prompted many SAR agencies to begin upgrading direction-finding equipment to enable their units to more effectively locate and home on 406 MHz beacons. The U.S. Coast Guard, U.S. Air Force, and USAF Auxiliary – Civil Air Patrol are all in various states of upgrading their respective inventories of SAR aircraft to 406 MHz direction finders.

Direction-finding using the 406 MHz frequency provides significant advantages over traditional direction finding on a beacon's 121.5 MHz homer. This includes increased detection range and decoding a beacon's unique identification number, among other benefits. Given that most 406 MHz direction finders also provide the ability to home on the 121.5 MHz frequency, these devices are considered far more capable.

With the growth in 406 MHz direction finders being used by SAR agencies, there is a requirement for SAR responders to properly train on these systems to acquire and enhance (through routine, recurring training) the skills needed to respond effectively and home on 406 MHz beacon activations. However, there exists no practical means to achieve this. That is, there are no 406 MHz beacons available for training purposes or supporting regulations/policy to support this capability.

Policy: It is the policy of the United States, therefore, to:

1) Permit the development, modification, and use of 406 MHz beacons for training purposes by and for Federal SAR agency use only;

2) Allow non-Federal SAR agencies to only use 406 MHz training beacons with the express consent of a sponsoring Federal SAR agency. *(This is in alignment with current Federal regulations which do not permit the use of 406 MHz beacons by non-Federal SAR entities in any situation other than in a distress.)*

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Technical & Physical Requirements: All 406 MHz training beacons shall typically meet the following minimum characteristics:

1) Shall be coded with the Test Protocol as defined in the Specification for Cospas-Sarsat 406 MHz Distress Beacons, document C/S T.001;

2) The homing transmitter shall be offset to an approved training frequency (e.g., 121.65 MHz, 121.775 MHz);

3) Shall meet the minimum technical requirements for 406 MHz beacons as defined in C/S T.001 and RTCM & RTCA Standards;

4) Shall be clearly marked to denote a training device and labeled to denote the operating parameters; and

5) Should have an easily maintainable battery due to repeated use.

Additional Requirements:

1) All 406 MHz training beacons shall be registered in the National 406 MHz Beacon Registration Database at www.beaconregistration.noaa.gov.

2) All training exercises using a 406 MHz training beacon shall be coordinated at least 48 hours in advance with the SARSAT U.S. Mission Control Center (USMCC). A unit's training supervisor shall submit a 406 MHz Training/Test Request Form (see Appendix D) via e-mail to the appropriate program POC.

   Note: SAR units shall determine, in advance, whether the training exercise will require the distribution of data from their training beacon via the USMCC to a Rescue Coordination Center (RCC) or whether the training exercise will be localized in nature (training using only the direction finder). This information shall be submitted with the Training Request Form and, if approved by the USMCC, must be coordinated with the appropriate RCC by the requestor.

3) No more than one 406 MHz training beacon should typically be used in a training exercise unless specifically approved via test request procedure.

Implementation: This policy shall be implemented by the U.S. SARSAT Program Steering Group (PSG), which is responsible for maintaining and updating its contents.

Approvals:
Version 1.0 by the SARSAT PSG on 13 December 2011
Revised policy, Version 1.2, by the SARSAT PSG on 13 June 2018

Appendix D - Beacon Test Form and Instructions

The Beacon Test Request Form (USMCC FRM MCC-051) is shown here for reference only; the most current form is available on the SARSAT Emergency Beacon Testing information webpage.

406 MHz Emergency Beacon Testing
Instructions for Completing the Test Request Form

Please complete the test request form only after you have read the SARSAT Policy on Non-Distress Transmissions and determined that you have a requirement to test that fits within one of the noted exceptions: *Self-Test Transmission, Built-in Test Transmission, Test Protocol Transmission,* or *Operational Protocol Transmission*.

Submission deadlines: 1-3 beacons - 48 hours (2 business days) prior to first event
4-6 beacons - 30 days before first event
7+ beacons - test/training not allowed

Use email to submit your request to the relevant agency:

USAF: AFRCC.Console@us.af.mil
The USAF Program POC will be responsible for coordinating all USAF, other uniformed services, Civil Air Patrol, state, test, training, and exercise requests.

USCG: HQS-DG-M-406-TEST-Request@uscg.mil
The USCG Program POC will be responsible for coordinating all USCG and USCG Auxiliary test, training, and exercise requests.

NOAA: beacon.test@noaa.gov
The NOAA Program POC will be responsible for coordinating all other requests for test, training, and exercise.

The requestor should complete all required information on Page 1 of the form, including:

- Requestor Contact information: All pertinent contact information should be included as noted.
- Reason for Request: Provide justification on why the test should be conducted and details on if, and how, the alert should be distributed. This information is vital to ensuring that the proper coordination can be made with the USMCC and test coordinator. *If more space is needed than is available on the form, please attach a separate page.*
- Activation Details: Provide on-site coordinator contact info, proposed start/end time, duration and location of test. Most importantly, provide the 15-hex ID and other identifying information for the beacon(s) being tested. *If more space is needed than is available on the form, please attach a separate page.*

FRM MCC-051 v01 406 MHz Emergency Beacon Test Request Form Instructions

406 MHz Emergency Beacon Test Request

SUBMISSION DEADLINES

1-3 beacons: 48 hours (2 business days) before first event
4-6 beacons: 30 days before first event
7+ beacons: Not allowed

REQUESTOR CONTACT INFORMATION

Requesting Agency/Organization _____

Requestor Name _____

Email _____

Telephone _____

Date Submitted _____

REASON FOR REQUEST *(attach separate page if more space required)*

Should alert message be distributed? ☐ Yes ☐ No If yes, distribute alert via (choose one of the following):

1. Fax to _____ fax number
2. Normal distribution methods to _____ RCC
   RCC POC: _____ Telephone: _____
3. Other; please explain: _____

ACTIVATION DETAILS

On-Site Coordinator Name _____

Phone _____ Email _____

Proposed Date _____ Start Time (UTC) _____ Duration of Activation _____ HH MM

Location _____ Latitude _____ ddd mm.m Longitude _____ ddd mm.m

Additional activation information *(attach separate page if more space required)*

Complete the following for each beacon:

15-HEX ID	TYPE	MANUFACTURER	MODEL	FREQUENCY	TEST CODED? (Y/N)

FRM MCC-051 v01 406 MHz Emergency Beacon Test Request Form, Page 1

Request for 406 MHz Emergency Beacon Test

AGENCY VALIDATION

Reviewed By:

Name _____

Email _____

Phone Number _____

☐ This request has been reviewed and forwarded to NOAA for approval and the requestor has been notified.

☐ This request has been reviewed and has been rejected and the requestor has been notified.

NOAA COORDINATION AND APPROVAL

Type of Request: ☐Testing ☐Exercise ☐Training

USMCC Chief Recommendation: ☐**APPROVE** ☐**DENY**

Signature _____ Date _____
USMCC Chief

USMCC System Manager Decision: ☐**APPROVED** ☐**DENIED**

Signature _____ Date _____
USMCC System Manager

☐ The requestor and sponsor agency have been notified of the status of the request.

FRM MCC-051 v01 406 MHz Emergency Beacon Test Request Form, Page 2