Radio Technical Commission for Maritime Services (RTCM)

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Beacon Manufacturers Workshop 2016

RTCM Overview

- RTCM is an international non-profit scientific, professional and educational organization
- Members are both government and non-government organizations
- Established in 1947 as a U.S. government advisory organization
- Now an independent organization with members from all over the world
- Headquartered in Arlington VA, (Washington DC)
- Bob Markle retired this week after 14 years as President, Kate Duffy has taken over

RTCM Main Activities

- RTCMs main area of activity is related to commercial shipping and navigation and radiocommunications systems for these vessels

- It also works in other areas when requested such as Differential GPS and Terrestrial Satellite Distress Alerting

- RTCMs main role is in developing standards, but it also plays a major part in national and international committees, information dissemination to its members and advising on legislation and regulatory changes

RTCM Impact / Benefits

RTCM has always led the way in developing standards for Cospas-Sarsat 406 MHz beacons and continues to do so today

EPIRBs

- RTCM EPIRB standard published in 1987, one of the first 406 MHz EPIRB standards in the world (ETSI 1992, IEC 1994)

- Allowed authorization of 406 MHz EPIRBs in the USA by the FCC

- To date there are around 215,000 EPIRBs in the NOAA database

- So we can estimate that well over 250,000 EPIRBs have been sold in the USA over the years

- Globally over one million EPIRBs have been produced since 1988

- In 2015 RTCM published the worlds first standard for an EPIRB with AIS locating function

PLBs

- RTCM PLB Standard published in 2002, one of the first 406 MHz PLB standards in the world
- Authorisation of PLBs in the USA in 2003 would not have been possible without the RTCM PLB standard
- To date there are around 175,000 PLBs (ex Military) in the NOAA database
- So we can estimate that around 225,000 PLBs have been sold in the USA over the years
- Globally over half a million PLBs have been produced over the last 10 years
- RTCM continues to innovate with work on a standard for a PLB with AIS locating function

Cospas-Sarsat

- RTCM has attended every JC meeting since 2005 (and individual members attended for some years before this)
- RTCM has submitted input papers to each meeting and has actively participated in refining C/S T.001 and T.007
- RTCM has attended every meeting on Second Generation Beacons since the first one in 2010
- RTCM is an active participant in submitting papers to SGB meetings and developing the T.018 standard and is now starting to work on the T.021 testing standard
- By necessity RTCM's work at C/S covers ELTs as well
- Next year RTCM will start working on Second Generation Beacon standards for EPIRBs and PLBs in the USA (once C/S T.018 is finalised)

RTCM
SC110 Sub-Committee
Emergency Beacons
(EPIRBs and PLBs)
Update

RTCM Special Committee SC110 on Emergency Beacons

- SC110's primary role is to develop and maintain standards for Emergency Beacons – 406 MHz EPIRBs, PLBs and 406 MHz Ship Security Alert Systems (SSAS)

- It is also involved in:
  - Considering new technology, ideas and other related matters of interest to its members e.g. AIS EPIRB, C/S MEOSAR system
  - RTCM also plays a very active role in the work of Cospas-Sarsat and in particular in its Joint Committee (JC) meetings
  - Developing input towards Second Generation Beacon Standards for MEOSAR
  - New EPIRB and PLB AIS standards

EPIRB Status

- Current standard RTCM 11000.4 published June 2015
- Addresses differences from the IEC standard
  - Mandatory Internal Navigation Device
  - Internal Navigation Device Timing
  - GNSS Self Test
  - Inadvertent Activation
  - Incorrect Mounting
  - Ergonomics Requirements and Tests
  - Cold Thermal Shock Tests
  - Testing internal GPS Receivers using GPS Simulators
- Includes options for AIS Homing signals
- FCC issued a NPRM to update Part 80 of the rules to adopt an updated RTCM EPIRB standard in 2014, the rule is currently working its way through the FCC

EPIRB Status

- RTCM 11000.4 EPIRB-AIS Standard
- Provides options for the following variants of EPIRB
  - Group 1 EPIRBs shall include a 121.5 MHz homing transmitter
  - Group 2 EPIRBs shall include an AIS transmitter
  - Group 3 EPIRBs shall include a 121.5 MHz homing transmitter and an AIS transmitter
- 406 MHz signals and AIS signals are interleaved
- 406 MHz signals take precedence over AIS signals in the event of a clash (i.e. can omit an individual AIS pulse if necessary)
- The EPIRB 15 Hex ID is broadcast over AIS as a Message 14 Safety Related Broadcast Message to tie identities together
- AIS signals and 121.5 MHz signals are interleaved
- AIS signals take precedence and can interrupt 121 signals for up to 50ms at a time to transmit a pulse if necessary
- The 121.5 MHz homing signal must have a minimum duty cycle of 33%, but can be up to 95% at the manufacturers discretion

PLB Status

- Current Standard RTCM 11010.2 Published July 2008
- Amendment 1 to above Std Published Aug 2010 – added Annex G Internal Navigation Device Test Methods and Test Procedures
- Amendment 2 to the above Published June 2012 – Amends part of Annex G
- Amendment 3 to the above Published June 2014 – Introduces
  - Mandatory internal GNSS, Altitude Test, Wet Self-Test
- Amendment 4 to the above Published October 2015 – Updates GNSS timing requirements to align with C/S T.001 and NOAA beacon coding requirements
- An FCC update to Part 95 of rules to adopt the new standard is being processed

PLB Status

- RTCM is working on a further update to permit PLBs to include an AIS transmitter, key items under consideration are:

Feature	Control	Function	406	121.5 / AIS	Comments
Activation	Off / On	Manual Activation Only	false alert issue		All signals commence immediately
	Off / On	Manual Activation with delayed start			Some signals maybe delayed in starting
	Off / Armed / On	Manual and Auto Activation	X	X	All signals commence immediately with necessary false alerts delays Methods of Auto activation to be left to the manufacturer (e.g. Pull cord, Water etc.)
	Off / Armed / On	Manual and Delayed Auto Activation			Delay times to be determined

PLB Status

- Update to permit PLBs to include an AIS transmitter, further key items under consideration are:

Feature	Control	Function	AIS	Comments
AIS Transmission	N/A	AIS Always Transmits		Maritime PLB or FCC approval required
	Off / On	Manual Control of AIS Transmissions	X	Can user be relied upon to make the change
	Software	Manual Control of AIS Transmissions		Wireless Control via an App or similar
	Software	Automatic based on Geofence	X	What accuracy can be achieved / required +/- 1 mile ?? – Intracoastal waterways ??? National, Regional or Global Geofence What's default if Geofence fails on start up If lose GPS default to last location

- 121 homing signal to be interleaved with AIS signals

RTCM
SC128 Sub-Committee
Satellite Emergency Notification Devices (SEND)

RTCM SC128 SEND STANDARD

- Current standard RTCM 12800.0 published August 2011
- Amendment 1 to the above standard was published August 2013, it added a Patent annex
- Amendment 2 to the above standard was published June 2014, it contained minor editorial clarifications to the Distress Alert Transmission Schedule for SENDs and to the distress message format to be sent to SAR services to match the IAMSAR Manual
- FCC NPRM proposed to continue to authorize SENDs pursuant to Part 25 of the MSS rules instead of adding them to Part 95, RTCM comment requested the FCC to reconsider, waiting for final rule

RTCM
SC119 Sub-Committee
Maritime Survivor Locator Devices
(MSLDs)
(or Manoverboard devices)

RTCM SC119 MSLD STANDARD

- Current standard RTCM 11901.1 published June 2012

- Amendment 1 to the above standard was published June 2014, it contained changes to permit both 'open loop' and 'closed loop' DSC devices

- The MSLD standard currently covers devices that:
  - Transmit on 121.5 MHz
  - Operate on VHF DSC Channel 70
  - Use Active Signalling
  - Transmit on VHF AIS frequencies

- FCC issued a NPRM to update Part 95 of rules to add MSLD devices last year, we understand that a rule is currently working its way through the FCC

- A further update is required to address ITU-R M.493-14

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RTCM makes a difference
but needs your contributions and inputs to do this

Thank you

For further information on RTCM and details of membership and the work of SC110 visit
www.rtcm.org