

# **Homing and Intelligent Transmit Schedule Correspondence Working Group (HITS-CWG)**

Co-Chairs:

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Beacon Manufacturers Workshop

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# What is HITS?

- HITS is a Cospas-Sarsat correspondence working group stood up in 2015 to define a homing and locating solution
- Established to evaluate and address a potential gap in search and rescue facilities' ability to locate a second-generation beacon (SGB)
- Support search and rescue facilities homing on first-generation beacon 406 MHz narrowband satellite signal with a similar capability for locating and homing on SGBs

# Activities following Cospas-Sarsat JC-31 (Sep 2017)

- Review of open JC-31 Action Items
  - Identified those relevant to HITS-CWG
  - JC-31/AI.8 – AIS and Homing Signals: use of a 406-MHz homing signal consistent with the ITU Radio Regulations
  - JC-31/AI.27 – NCSR 2 and MSC 95 Sessions: performance of 121.5 MHz homing signal with reduced duty-cycle
  - TWG-31/AI.15 – “Second Generation” Beacon Specifications (C/S T.018) - AIS and Homing Signals: in-band interference from a 406-MHz homing signal
  - TWG-31/AI.16 – “Second Generation” Beacon Specifications (C/S T.018) - AIS and Homing Signals: testing and investigate the susceptibility of the LEOSAR, MEOSAR, and GEOSAR payloads to in-band interference
  - TWG-31/AI.17 – “Second Generation” Beacon Specifications (C/S T.018) - AIS and Homing Signals: programmatic risks associated with in-band 406 MHz homing signal
  - TWG-31/AI.37 – Updates to Document C/S T.018:
    - conduct testing or simulations to ascertain appropriate 406-MHz Type-1 and Type-2 homing signal power levels
    - assessments and identify requirements for short range (close-in) homing on 406-MHz homing signals

# Activities following Cospas-Sarsat JC-31 (Sep 2017)

- Review of ITU Radio Regulations (2016 Edition) for 406 homing
  - identified concern of potential conflict between Article 32 and Appendix 15
  - USA, in consultation with the United Kingdom and RTCM, submitted document to IMO/ITU Experts Group (document IMO/ITU EG-14/8)
  - Experts Group recommended USA bring this to attention of ITU Working Party 5B (WP-5B)
- 406 MHz Homing Signal Benefits and Risks Analysis
  - Initial work to identify the benefits (advantages) and risks (disadvantages)
  - more work necessary to complete review and perform analysis before exploring and identifying the trade-offs

# Activities following Cospas-Sarsat JC-31 (Sep 2017)

- Requirements for beacon homing and locating
  - USA / RTCM identified requirements for beacon homing and locating
    - current homing requirement in G.008
    - feedback received from the OWG at JC-31
    - noted a disconnect between these two items and lack of clarity in G.008
    - document submitted to JC-32 to review homing requirements and update G.008
- Evaluate Using 406 MHz Spread Spectrum Signal for Homing/Locating
  - reviewed concepts for modifying or developing DF homing equipment designed to detect, locate, and possibly decode wideband satellite bursts
  - Mobit proposal for SGB-homing leveraging time / frequency of arrival of signal using synchronized / known time of signal transmission

# Activities following Cospas-Sarsat JC-31 (Sep 2017)

- Homing Performance of reduced duty-cycle 121.5 MHz signal
  - operational trials or empirical testing of 121.5 MHz homing equipment performance of signals with 33%, 50%, & 66% duty cycles
    - USA completed trials in Gulf of Mexico, Pacific Northwest, and Northeast Atlantic regions
    - Canada conducted testing off Newfoundland
    - Norway conducted additional homing trials in North Sea
    - Australia and UK conducted prior work
  - ICAO/IMO Joint Working Group on Search and Rescue reviewed results
    - In general, Australia, Norway, UK, and USA observed no significant degradation in locating beacons with reduced duty-cycle 121.5 MHz signals
    - Canada noted some difficulties with a reduced duty-cycle signal, but still located the beacons
    - JWG-SAR will report findings to next NCSR

# Next Steps

- Monitor NCSR 6 outcomes on review of 121.5 MHz homing duty-cycle
- Monitor ITU Working Party 5B (WP-5B) discussions on 406 MHz
- Review results of JC-32, NCSR 6, and WP-5B and adjust work plan appropriately
- Continue work on benefits (advantages) and risks (disadvantages), perform analysis, and identify and explore trade-offs
- Continue evaluating homing/locating using 406 MHz Spread Spectrum Signal

**Thank you for your attention!**

Questions?