Executive Summary

The joint RTCA SC-242 / EUROCAE WG-124 Plenary #5 meeting was held on April 20, 2023. The meeting was held in hybrid format with both in-person at Airbus Toulouse facilities and virtual attendees.

- Briefings were presented on the following topics:
  - Risk Register
  - Subgroup 1 Output to SC-242/WG-124 Plenary
  - Subgroup 2 Plenary Summary – SC-242/WG-124
  - Report 2 Outline
  - FCC Spectrum Efficiency Policy

Meeting materials are available as follows (link may need to be copied into browser):
- See RTCA AerOpus April 20, 2023 Plenary Meeting #5 folder for the Risk Register, Subgroup 1 Output to SC-242/WG-124 Plenary, and Subgroup 2 Plenary Summary – SC-242/WG-124:
- See RTCA AerOpus Report 2 folder for the Report 2 Outline (see specifically Document Revision 2.0):
- See EUROCAE Workspace April 20, 2023 Plenary Meeting #5 folder for all but the FCC Spectrum Efficiency Policy:
  https://eurocae.sharepoint.com/sites/strato/143ce6de-838d-ec11-b400-000d3ab41693/a837e9d7-95d4-ed11-a7c7-000d3adea432/SitePages/Documents.aspx
- See the published FCC Spectrum Efficiency Policy at:
  https://www.fcc.gov/ecfs/search/search-filings/filing/104211841619616

- Next Meeting:
  - Joint RTCA SC-242 / EUROCAE WG-124 Plenary #6
    - July 25-27, 2023 at RTCA headquarters in Washington, DC
Joint Plenary Meeting Summary

The joint RTCA SC-242 / EUROCAE WG-124 Plenary #5 meeting was held on Thursday April 20, 2023. The meeting was held in hybrid format with both in-person at Airbus Toulouse facilities and virtual attendees.

Meeting materials are available as follows (link may need to be copied into browser):

- See RTCA AerOpus April 20, 2023 Plenary Meeting #5 folder for the Risk Register, Subgroup 1 Output to SC-242/WG-124 Plenary, and Subgroup 2 Plenary Summary – SC-242/WG-124:

- See RTCA AerOpus Report 2 folder for the Report 2 Outline (see specifically Document Revision 2.0):

- See EUROCAE Workspace April 20, 2023 Plenary Meeting #5 folder for all but the FCC Spectrum Efficiency Policy:
  https://eurocae.sharepoint.com/sites/strato/143ce6de-838d-ec11-b400-000d3ab41693/a837e9d7-95d4-ed11-a7c7-000d3adea432/SitePages/Documents.aspx

- See the published FCC Spectrum Efficiency Policy at:
  https://www.fcc.gov/ecfs/search/search-filings/filing/104211844619616

Thursday, April 20th Plenary
The Plenary convened at approximately 0700 EDT / 1300 CEST

1. Host and Co-Chairs Welcome and Introductions
   - Ed Hahn and John Micallef welcomed participants.
   - Ed managed the participant introductions.
   - Attachment A lists the combined participants for the Plenary and subgroup meetings that occurred on April 18-20, 2023.

2. Administrative matters – RTCA & EUROCAE Policies
   - Rebecca Morrison and Anna Guegan presented the RTCA and EUROCAE mandatory slides on anti-trust, proprietary/intellectual property, committee participation membership, and GDPR privacy policies.

3. Review of Meeting Agenda
   - Ed Hahn presented the meeting agenda. Ed asked if there were other agenda items, and none were offered.

4. Approval of Plenary #4 Meeting Minutes
   - Clay Barber presented the draft November 10, 2022 plenary minutes.
   - Clay asked if there were any amendments to the minutes and none were offered.
   - The minutes were approved.

**Post meeting note:** The final minutes were posted to the November 10, 2022 Plenary Meeting #4 folder on AerOpus and Workspace.
5. Review of Prior Actions and Risk Register
   - **Review of Actions**: The open actions from the November 10, 2022 plenary minutes were reviewed.
     - March 20, 2022 plenary #1:
       - Action 1: It was noted that efforts continue to be made to identify a WG-124 Secretary. It was agreed to keep Action 1 open and extend the due date to Plenary Meeting #6.
       - Action 2: It was agreed to keep Action 2 partially open and extend the due date to identify document editors to Plenary Meeting #6.
     - September 9, 2022 plenary #3:
       - Actions 14, 15, and 17: Agreement to close.
     - November 10, 2022 plenary #4:
       - Actions 18, 19, 20 and 21: Agreement to close.
   - **Risk Register**: John Micallef presented the risk register.
     - John provided an update on each risk and noted the changes to some of the risk impacts and probability of occurrence.
     - John will maintain the risk register and requests any additional risks be communicated to him and Ed.

6. Internal Coordination and Subgroup Reports to Plenary
   a. Status of Work by Subgroup Leads
      - **Subgroup 1 (SG1)**:
        - Andy Roy led the discussion of the SG1 slides (attached).
        - There was discussion of:
          - Per EUROCAE processes, approval of Report 1 must be by the committee during a plenary, which could be virtual.
          - Potential for multiple weekly sessions to move the work forward more quickly.
      - **Subgroup 2 (SG2)**:
        - Capucine Amielh led the discussion of the SG2 slides (attached).
        - ENAC Participation
          - Appreciation was expressed for the participation and contribution by El-Mehdi Djelloul and Alexandre Chabory during the subgroup sessions.
          - Remi Douvenot introduced himself and offered assistance to furthering the SG2 Guidance document.
        - DGAC Participation
          - Appreciation was expressed for the participation of Christian Fleury and Guillaume Novella throughout the sessions.

   - **Report 2**: 
o Ed Hahn briefed the TOR tasking for Report 2 RF systems and their regulatory framework and operational considerations and the outline that was discussed during the SG sessions.
o John Micallef noted that while the primary audience for Report 2 is non-aviation stakeholders, it will also be used for aviation stakeholders, so it will be important to ensure that it addresses both audiences.

b. Tasks Allocation Discussion
   • Not discussed

7. External Coordination
   a. Correspondence and Announcements on Input Material from Other RTCA/EUROCAE SCs/WGs (Review of Survey Tracker)
      • A summary of the survey responses received and efforts to obtain further responses was provided by Andy Roy during the SG1 briefing, so it wasn’t repeated during this agenda item.
      • SC-236/WG-96 WAIC MOPS Discussion
         o Uwe Schwark and Dave Redman joined as guests and provided an introduction to the history of the WAIC system ITU allocation, ICAO SARPs, MASPS, and MOPS development.
         o WAIC MOPS purposely does not specify some typical RF characteristics (e.g., channelization, etc.). Instead, it is focused on security and non-interference with radar altimeters, with which WAIC shares the 4200-4400 MHz frequency band. Off-board compatibility is addressed through the SARPs while on-board compatibility is addressed by the MOPS.
         o The WAIC MOPS is currently undergoing RAC in SC-242/WG-124 until May 15, 2023.
         o Uwe and Dave request SC-242/WG-124 feedback on only the RF related:
            - Requirements,
            - Equipment test procedures, and
            - Installation compatibility portions of the MOPS.
            About 15-20 pages.
         o Request is to consider whether the WAIC MOPS approach will be useful for spectrum compatibility sharing studies concerns are being met. This will assist SC-236/WG-96 with updating the MOPS before proceeding to FRAC.
         o RAC closes May 15, 2023.
         o The MOPS is available through the AerOpus Shared Documents tab but also can be distributed to members as necessary. Comments can be submitted through the AerOpus tool.
         o Sai Kalyanaraman brought up the potential need for coordination between WAIC and radar altimeter manufacturers.
         o Kim Kolb supported the review request as a potential example of good spectrum compatibility RF characteristics.
   • ACTION: SC-242/WG-124 membership to review RF-specific areas of WAIC MOPS by May 15, 2023.
b. Status from Other External Groups (e.g., CEPT, ICAO, FCC, etc.)
   - It was noted that John Micallef provided a briefing on SC-242/WG-124 tasking and status at the February ICAO FSMP.
   - Andy Roy briefed the committee on the proposed FCC Spectrum Efficiency Policy that was being considered by the Commission today. The briefing focused on the need for this policy to be considered during the development of the SG2 Guidance document.

**Post meeting note:** The FCC approved the Spectrum Efficiency Policy at its April 20, 2023 Open Meeting. The published FCC Spectrum Efficiency Policy is available at: [https://www.fcc.gov/ecfs/search/search-filings/filing/104211841619616](https://www.fcc.gov/ecfs/search/search-filings/filing/104211841619616).

- Loftur Jonasson provided a summary of the ICAO ICNS Task Force efforts related to its CNS modernization roadmap and efforts to identify what should be included in ICAO Annexes for SARPs.
- Andy Roy provided a summary of the ICAO FSMP efforts including its ICAO WRC23 position. It was noted that the WRC23 efforts have delayed the FSMP planned updates to ICAO Handbook. The FSMP has also discussed a working paper on SARPs for radar altimeters. Andy also expressed appreciation for the briefing presented on SC-242/WG-124 and requested a semiannual briefing. The next FSMP meeting is in August 2023.
- **ACTION:** Ed Hahn and John Micallef to provide semiannual briefings on SC-242/WG-124 to FSMP.

8. Approve Entry of Review and Comment (RAC) Period by SCs/WGs for Report 1
   - The committee agreed that Report 1 was not ready for approval to enter RAC and the need to notify the RTCA PMC and EUROCAE TAC. The following actions was recorded.
     - **ACTION:** Ed Hahn to provide update on the Survey Report delay at the Jun 2023 PMC meeting.

9. Documentation of Actions
   - Clay Barber provided the list of actions he had captured from the April 20 Plenary. The actions were amended as suggested by the committee and are captured in the following table.

   - **Current SC-242/WG-124 Plenary Action Item list**
     - Action Items closed during this Plenary are shaded in grey in the following table.
     - New Action Items identified during this Plenary are shaded in green in the following table.
     - Actions closed in previous Plenary sessions are not listed.

<table>
<thead>
<tr>
<th>#</th>
<th>Owner</th>
<th>Action</th>
<th>Date</th>
<th>Due Date</th>
<th>Status</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Anna Guegan / John Micallef</td>
<td>Identify WG-124 Secretary</td>
<td>Mar 10, 2022</td>
<td>Jul 27, 2023</td>
<td>Open</td>
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<tr>
<td>2</td>
<td>Ed Hahn / John Micallef</td>
<td>Identify subgroup leads and document editors</td>
<td>Mar 10, 2022</td>
<td>Jul 27, 2023</td>
<td>Partially Open</td>
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</tbody>
</table>
## 10. Pending TOR Changes
- Rebecca Morrison requested that SC-242 update to Jun 2023 PMC note that the way Reports are published in RTCA Store will be with a new nomenclature as well as notifying them of Report 1 schedule slip.
- **ACTION:** SC-242/WG-124 Leadership to determine document identifier nomenclature for reports available through the RTCA Store.
- **ACTION:** Add SC-242 & WG-124 TOR amendment on the Jul 2023 plenary agenda.

## 11. Date and Venue of Next Meeting
- The committee agreed to resume subgroup weekly meetings on April 25, 2023.
- The committee agreed to meet for Plenary #6 on July 25-27, 2023 at RTCA headquarters in Washington DC. There will be a hybrid option.
- The committee discussed the potential for a virtual plenary to approve Report 1 in Sep or Oct 2023. A date will be decided at Plenary #6.

### Table: Action Items

<table>
<thead>
<tr>
<th>#</th>
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<th>Date</th>
<th>Due Date</th>
<th>Status</th>
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<tbody>
<tr>
<td>14</td>
<td>Ed Hahn / John Micallef</td>
<td>SC-242/WG-124 to prepare a presentation for the February ICAO FSMP (ensuring coordination with RTCA/EUROCAE)</td>
<td>Sep 9, 2022</td>
<td>Feb 1, 2023</td>
<td>Closed</td>
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<tr>
<td>15</td>
<td>Anna Guegan</td>
<td>Bring proposed report title changes to EUROCAE TAC for consideration</td>
<td>Sep 9, 2022</td>
<td>Nov 23, 2022</td>
<td>Closed</td>
</tr>
<tr>
<td>17</td>
<td>John Mettrop / Anna Guegan</td>
<td>Determine April 2023 Plenary 5 location</td>
<td>Sep 9, 2022</td>
<td>Jan 15, 2023</td>
<td>Closed</td>
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<tr>
<td>18</td>
<td>Ed Hahn</td>
<td>Change SC-242 TOR to update report title changes</td>
<td>Nov 10, 2022</td>
<td>Dec 15, 2022</td>
<td>Closed</td>
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<tr>
<td>19</td>
<td>All</td>
<td>Contribute to identifying risks that should be included in risk register</td>
<td>Nov 10, 2022</td>
<td>Nov 29, 2022</td>
<td>Closed</td>
</tr>
<tr>
<td>20</td>
<td>Ed Hahn / John Micallef</td>
<td>Send another reminder to other SCs/WGs about survey due dates</td>
<td>Nov 10, 2022</td>
<td>Nov 30, 2022</td>
<td>Closed</td>
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<tr>
<td>21</td>
<td>Ed Hahn</td>
<td>Start Report #2 outline</td>
<td>Nov 10, 2022</td>
<td>Apr 20, 2023</td>
<td>Closed</td>
</tr>
<tr>
<td>22</td>
<td>All</td>
<td>Review RF-specific areas of WAIC MOPS</td>
<td>Apr 20, 2023</td>
<td>May 15, 2023</td>
<td>Open</td>
</tr>
<tr>
<td>23</td>
<td>Ed Hahn / John Micallef</td>
<td>Provide semi-annual briefings on SC-242/WG-124 to FSMP</td>
<td>Apr 20, 2023</td>
<td>Per FSMP Meeting Schedule</td>
<td>Open</td>
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<tr>
<td>24</td>
<td>Ed Hahn</td>
<td>Provide update on the Survey Report delay at Jun 2023 PMC meeting</td>
<td>Apr 20, 2023</td>
<td>Jun 22, 2023</td>
<td>Open</td>
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<tr>
<td>25</td>
<td>Ed Hahn / John Micallef</td>
<td>Determine document identifier nomenclature for reports available through the RTCA Store</td>
<td>Apr 20, 2023</td>
<td>Jun 22, 2023</td>
<td>Open</td>
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<tr>
<td>26</td>
<td>Ed Hahn / John Micallef</td>
<td>Add SC-242 &amp; WG-124 TOR amendment on the Plenary #6 agenda</td>
<td>Apr 20, 2023</td>
<td>Jul 27, 2023</td>
<td>Open</td>
</tr>
</tbody>
</table>
• The committee agreed the next in person plenary would be in January 2024 in Europe. Dates will be decided at Plenary #6.

<table>
<thead>
<tr>
<th>Meeting Dates</th>
<th>Locations (Hosts)</th>
<th>Meeting Goal</th>
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<tbody>
<tr>
<td>July 25-27, 2023</td>
<td>Washington DC (RTCA) (hybrid)</td>
<td>1. Finalize and approve Report #1 for RAC</td>
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<td></td>
<td></td>
<td>2. Progress Guidance document and Report #2</td>
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<td></td>
<td></td>
<td>3. Discuss TOR amendment</td>
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</tbody>
</table>

12. Any Other Business
   • Capucine Amielh noted that she has been asked to take a different position within Airbus and will not be able to continue as SG2 leader.
     o Capucine noted the plan is for her colleague Olivier Pellay to replace her pending Airbus management approval.
     o John Micallef and Ed Hahn thank Capucine on behalf of the committee for her leadership and for the vision for the Guidance document.
     o Ed and John also welcome Olivier to the committee.
   • John and Ed also thanked Capucine and Valentin Le Mire for the Airbus hospitality.

13. Adjournment
   • The Plenary adjourned at approximately 0905 EDT / 1505 CEST on Thursday April 20, 2023.

CERTIFIED as a true and accurate summary of the meeting.

Clay Barber, SC-242 Secretary  TBD, WG-124 Secretary

Ed Hahn, SC-242 Chair  John Micallef, WG-124 Chair
### Leadership

<table>
<thead>
<tr>
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<tr>
<td>Ed Hahn</td>
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<tr>
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<tr>
<td>John Micallef</td>
<td>EUROCONTROL</td>
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<td>WG-124 Chair</td>
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<td>Clay Barber</td>
<td>Garmin</td>
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<td>SC-242 Secretary</td>
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<td>Chris Tourigny,</td>
<td>FAA</td>
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<td>SC-242 Government</td>
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<td>Authorized Representative</td>
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<td>Rebecca Morrison</td>
<td>RTCA</td>
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<td>SC-242 Program Director</td>
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<td>Anna Guegan</td>
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<td>WG-124 Technical Program</td>
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<td>Manager</td>
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<td>Andrew Roy</td>
<td>ASRI</td>
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<td>Subgroup 1 Lead</td>
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<tr>
<td>Capucine Amielh</td>
<td>Airbus</td>
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<td>Subgroup 2 Lead</td>
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### Membership

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<tr>
<td>Bernhard Haindl</td>
<td>Frequentis AG</td>
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<td>Clint Quesenberry</td>
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<td>Dave Redman</td>
<td>AVSI</td>
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<td>Donny Morrow</td>
<td>ALPA</td>
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<tr>
<td>Earle DePass</td>
<td>TCCA</td>
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<td>Greg Orell</td>
<td>Mitre</td>
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<td>Guillaume Novella</td>
<td>DGAC/DSNA</td>
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<tr>
<td>Jessie Turner</td>
<td>Boeing</td>
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<tr>
<td>Jose Luis Chinchilla Garcia</td>
<td>Indra Sistemas</td>
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<tr>
<td>Josep Ginè</td>
<td>ATR</td>
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<td>Kathryn Bernazzani</td>
<td>DOT Volpe Center</td>
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<td>Kim Kolb</td>
<td>Boeing</td>
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<td>Loftur Jónasson</td>
<td>ICAO</td>
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<td>Mauro Pagliarini</td>
<td>EASA</td>
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<td>Miguel Munoz</td>
<td>IFP Energies</td>
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<tr>
<td>Naruto Yonemoto</td>
<td>Electronic Navigation Research Institute (ENRI), Japan</td>
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<td>Nick Rico</td>
<td>Textron</td>
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<td>Olivier Pellay</td>
<td>Airbus</td>
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<tr>
<td>Sai Kalyanaraman</td>
<td>Collins Aerospace</td>
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<tr>
<td>Sam Weich</td>
<td>Ligado Networks</td>
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### Name  |  Organization
---|---
Sasa Jankovic  |  Bundesaufsichtsamt für Flugsicherung, Germany
Sergio Bovelli  |  Airbus
Stephen Van Trees  |  FAA
Steve Giles  |  Mitre
Uwe Schwark  |  Airbus
Wes Googe  |  American Airlines
Xavier Esneu  |  Collins Aerospace

### Guests

<table>
<thead>
<tr>
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<tr>
<td>Alexandre Chabory</td>
<td>ENAC</td>
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<tr>
<td>Christian Fleury</td>
<td>DGAC/DNSA</td>
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<tr>
<td>El-Mehdi Djelloul</td>
<td>ENAC</td>
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<tr>
<td>Piet van den Berg</td>
<td>KLM</td>
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<td>Ravi Jain</td>
<td>FAA</td>
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<td>Rémi Douvenot</td>
<td>ENAC</td>
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<td>Valentin Le Mire</td>
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<tr>
<td>Column</td>
<td>Instructions For Completing This Document</td>
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<tr>
<td></td>
<td><strong>Complete the Project Name, NC, Project Manager Name, and Project Description fields.</strong></td>
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<tr>
<td></td>
<td><strong>For each risk identified, complete the following:</strong></td>
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<tr>
<td>A</td>
<td><strong>ID:</strong> A unique ID number used to identify the risk in the risk tracking log.</td>
</tr>
</tbody>
</table>
| B      | **Current Status:** This column should be populated with the risk’s current status.  
|        | o **Open:** The risk is currently open but is not yet an issue.  
|        | o **Closed:** The risk is no longer considered an active project threat and can be closed with or without resolution. |
| C      | **Risk Impact:** This column should be populated with the potential impact of the risk if it did become a project issue. Valid options include the following: High, Medium, Low. These are defined as follows:  
|        | o **High:** Risk that has the potential to greatly impact project cost, project schedule or performance.  
|        | o **Medium:** Risk that has the potential to slightly impact project cost, project schedule or performance.  
|        | o **Low:** Risk that has relatively little impact on cost, schedule or performance. |
| D      | **Probability of Occurrence:** This column should be populated with the estimated probability that the risk will at some point become a project issue. |
| E      | **Risk Map:** This is a calculated field based on the values selected for both Risk Impact and Probability of Occurrence.  
|        | o **Green:** LL (Low Probability, Low Impact), LM (Low Probability, Medium Impact), ML (Medium Probability, Low Impact)  
|        | o **Yellow:** LH (Low Probability, High Impact), MM (Medium Probability, Medium Impact), HL (High Probability, Low Impact)  
|        | o **Red:** MH (Medium Probability, High Impact), HM (High Probability Medium Impact), HH (High Probability, High Impact) |
| F      | **Risk Description:** This column should be populated with a description of the risk. |
| G      | **Project Impact:** This column should be populated with a description of the potential project impact as a result of the risk. |
| H      | **Risk Area:** This column should be populated with the appropriate risk area. |
| I      | **Symptoms:** This column should be populated with the symptoms of risk that may eventually lead to the execution of a risk contingency plan. |
| J      | **Trigger:** This column should be populated with the triggers that would indicate the requirement to execute contingency plans. |
| K      | **Risk Response Strategy:** This column should be populated with the preferred risk response strategy. |
| L      | **Response Strategy:** This column should be populated an appropriate response strategy to prevent the risk from becoming an issue. |
| M      | **Contingency Plan:** This column should be populated with a description of the risk contingency plan. |

<table>
<thead>
<tr>
<th>Column</th>
<th>Instructions For Changing the Contents of Drop-Down Menus</th>
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| C, D, H| Highlight the cell of which you wish to change the content of the drop down menu.  
|        | From the file menu click "Data" -> "Validation" and change the content of the source field |

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| Any    | Highlight the header of the cell you wish to filter data on  
|        | From the file menu click "Date" -> "Filter" ->"Auto Filter"  
|        | Then select your filter criteria from the drop down menu that appears on your header cell |
|----|----------------|-------------|---------------------------|------------------|----------------|-----------|----------|----------|------------------------|-----------------|------------------|
| P3 | Open           | Medium      | High                      | Red              | Survey outcome ineffective or late. | Schedule | Lack of timely responses, or non responses from committee chairs | Four weeks prior to scheduled start date if no resource is identified with required skill set implement contingency plan. | Mitigation | (i) Guidance clarifying instructions for survey respondees (ii) Segmentation of responses into compulsory and optional entries | Agree a sequential delivery of responses. |
| P3 | Open           | Medium      | Low                       | Green            | Lack of internal (SG) expert resource | Resources | Lack of committee member contributions | | Avoidance | | Sequential sequencing of tasks. Allocation of experts' time through resource register managed at SG level. Find resource that meets required skill set through external hiring sources. |
| P3 | Open           | Low         | Low                       | Green            | Lack of system expertise to cover gaps in survey | Expertise | Incomplete survey submissions | | Contingency | | |
| P4 | Open           | Low         | Low                       | Green            | Impact of WRC23 preparations on committee's calendar | Schedule | Key experts inability to attend meetings or to contribute to deliverables in a timely manner. | Meeting clashes with other spectrum committees related to ICAO and to ITU WRC23 | Contingency | active tracking of external spectrum committee meetings vs key experts | |

**Project Name:** SC242/WG124

**Project Description:** Spectrum efficiency

**Project Manager Name:** Chair
Update to SC-242/WG-124
Plenary

SG1
20 Apr 2023
Objectives for Apr 2023 WG-W SG1 Activities

• Review status of RF survey responses
  • What has been received
  • What is outstanding

• Report #1 drafting activity
  • Reviewed current text in report main body

• Review timelines/workplan
  • Future meetings/timeline planning
RF Survey Statistics

• Updated survey status tracker

• 73 Documents identified
  • 7 are currently removed as they have no relevant RF component

• 66 documents total (currently) for responses
  • 8 are completely written up in the report
  • 16 have notes in the report (need to be written up)
  • 3 have been reviewed but are missing notes
  • 39 documents have yet to have a response
    • 10 from SC-159 which will be consolidated into a single response

• Review process
  • 27 high priority outstanding
    • Incls the 10 from SC-159
  • 31 documents need introductions
High priority documents still outstanding

DO-155 – MPS Airborne Low-Range Radar Altimeters
DO-160G/ED-14G with Change 1 – Environmental Conditions and Test Procedures for Airborne Equipment - Sections 19 and 20
DO-210D with Changes 1, 2, 3, 4 & 5 – MOPS for Geosynchronous Orbit Aeronautical Mobile Satellite Services Aircraft Earth Station Equipment
DO-235B/C – Assessment of Radio Frequency Interference Relevant to the GNSS L1 Frequency Band
DO-307B/ED-239A – Aircraft Design and Certification for Portable Electronic Device (PED) Tolerance
DO-362A – Command and Control (C2) Data Link MOPS (Terrestrial)
DO-363A/ED-130B – Guidance for the Development of Portable Electronic Devices (PED) Tolerance for Civil Aircraft
ED-030 – MPS for Airborne Low-Range Radar Altimeter Equipment
ED-115 – MOPS for Light Aviation Secondary Surveillance Radar Transponders
ED-117A – MOPS for Mode S Multilateration Systems for use in A-SMGCS
ED-129B – Technical Specification for a 1090MHz Extended Squitter ADS-B Ground Station
ED-142 – Technical Specification for Wide Area Multilateration Systems
ED-235 – MASPS for Foreign Object Debris Detection Systems
ED-259 – MOPS DFMC and SBAS
ED-265 - Minimum Operational Performance Standard for RPAS Command and Control Data Link (C-Band Satellite)
ED-266 – Guidance on Spectrum Access, Use and Management for UAS
Report Review Progress

• Current **draft report**
• Reviewed majority of main body
  • Work through majority of document front to back
  • Identified additional drafting work
• Focused on:
  • Accuracy
    • Answering the TORs
    • Meeting the needs of SG-2
  • Readability
    • Understandable to aviation and non-aviation audiences
    • Remove ambiguity (i.e. are we all understanding what the questions are asking)
• Continuity
  • Any additional work needed
Timelines/Workplan

• Apr
  • 18-20 – 242/124 full Plenary to progress reports
  • 25 – Continue to incorporate other responses

• May
  • Weekly sessions - Continue to incorporate other responses

• June
  • Weekly sessions - Continue to incorporate other responses and update report main body text

• July
  • 25-27 – Plenary – Full review of report ready for SC/WG review

• Aug
  • Focus on SG2/holidays

• Sep
  • 12 – Review feedback from SCs/WGs
  • 19 – Review feedback from SCs/WGs
  • 26 – Final document released?
Tuesday, 18 April 2023
● 13:00 - 16:00
  ○ Review of work plan and planning
  ○ ENAC PhD presentation on antenna models
  ○ Go through IP3 Receiver contribution

Wednesday, 19 April 2023
● 13:00 - 17:00
  ○ Contribution on IP1 RF survey & recommendations (AIRBUS)
  ○ Contribution on IP2 Transmitter (FAA)
  ○ Contribution on IP5 Interference scenarios (BOEING)

Thursday, 20 April 2023
● ~13:30
  ○ Report to plenary
Work plan and planning

- Reminder on Information Papers process
- Reminder on how Information Papers will feed the standard process
- First batch of IPs (1 to 5) advances well
- IP1 dependency to the RF survey report is not critical yet

Objective for the next plenary:
- Advance on IP1 to 5 concepts
- Identify an editor as IP1 to 5 will have enough content to start filling the new standard
Antenna mounted on aircraft model

- Deterministic-statistical pattern to render antenna behavior in all directions to account for various antenna configurations and aircraft classes
- Potential application for RA/5G, GNSS/Jamming & Spoofing
- Chosen examples so far:
  - GNSS
  - RA
  - VHF
  - DME
Proposal of a scoring of documents with respect to the adequacy of RF parameters definitions

➢ In a factual point of view to support other committees to review the RF sections of their document

Contributors:
- Capucine AMIELH, Airbus
- Olivier PELLAY, Airbus
IP2: How to fully describe a transmitter spectrum envelope

Contributors:
- Clint QUISENBERRY, FAA

Proposal of a detailed transmitter RF processing
- Good educational content
- Approach agreed
IP3: How to fully describe a receiver spectrum envelope

Contributors:
- Valentin LE MIRE, Airbus
- Capucine AMIELH, Airbus

AIRBUS progress presented including:
- introduction, noise, sensitivity
IP5: Interference scenarios

Contributors:
● Jessie TURNER, BOEING

Discussion on the operational and RF scenarios
This document will develop recommendations for committees to establish precise interference scenarios
Copies of this document may be obtained from
RTCA, Inc.
Telephone: 202-833-9339
Facsimile: 202-833-9434
Internet: www.rtca.org
Please visit the RTCA Online Store for document pricing and ordering information.
OUTLINE

TOR Scope:

"The committee shall develop high-level material to assist non-aviation stakeholders to understand how aeronautical RF systems are used and the performance necessary (e.g., availability, reliability, continuity, latency, etc.) for safety-of-life functions and how they fit into the overall management of airspace. Additional material that discusses aviation lifecycles and the timeframes necessary for design, testing, certification, manufacture, and installation of new or updated equipment also shall be developed."

(a) Introduction

(b) Scope

(a) High Level Aviation Concept of Operations - RF systems used for Safety and Regularity of Flight: Safety Management and Mission Critical communications. Mission Critical can escalate to safety of life quickly (e.g. medical emergency, aircraft malfunction, aircraft tracking); treat them as one.

(i) ATC

(ii) Airspace Design and Charted Procedures

1. Separation from ground / "obstacle clearance"

(iii) Flight Operations

1. Flight Planning - including role of AOC throughout the flight
2. Preflight - Taxi Out
3. Takeoff - Climb
4. Cruise
5. Descent - Approach
6. Landing - Taxi In

(iv) New Entrants

1. UAS/UAM
2. Commercial Space

(c) Design, Certification and Installation of Aviation Systems

(i) Aviation Safety Management System(s)

(ii) Aircraft System Safety Assessment (SSA, FHA, Fault Trees/FMEA) - historically equipment, but now cyber, external threats (other wireless systems)

(iii) Development Assurance Levels

1. integrity + continuity (enroute) / availability (approach) - broken down by phase of flight. e.g. as it applies to interference dwell time.

   a. E.g. radalt dual installs to meet performance, but common failure mode breaks purpose of dual install: Unavailability due to interference

(iv) Equipment Performance

(v) RF Performance
(v) Operational tolerance for unavailability (individual flight vs. operation)
(vi) Process and timelines - OSED, SPR, MASPS, MOPS, TSO, TSOA, TC/STC, Installation
(d) High Level Classification of Aviation RF Systems
(i) Communications
   1. Voice - HF, VHF, SATCOM
   2. Data - ATS Data Link, AOC Data Link, Maintenance Data
      a. VHF ACARS/VDL2, HF Data Link, SATCOM, UAS C2, AeroMACS, WAIC
      b. Future LDACS (also fits under navigation)
(ii) Navigation
   1. Terrestrial RF Navigation Aids - NDB/ADF, VOR, ILS, Marker, DME/TACAN, GBAS, (LDACS)
   2. Space Based RF Navigation Aids - GNSS (GPS + other constellations, SBAS systems)
   3. RF Sensors used for navigation (e.g. WXR, RadAlt, EFVS, etc.)
   4. Non RF (e.g. Inertial, Attitude Heading Reference Systems, Air Data) - very short / just to mention they exist
(iii) Surveillance
   1. Primary Surveillance Radar (just to mention the bands they use)
   2. Secondary Surveillance Radar
      a. ATCRBS and Mode S Transponders
   3. ADS-B
   4. UAS ground and airborne surveillance radars
   5. Forthcoming UAS V2V
   6. UAS CNPC
(iv) Safety Systems Using Inputs (could be integrated with the feeding system descriptions instead)
   1. TCAS/ACAS (including variants)
   2. TAWS (including landing configuration, etc.)
   3. Predictive/Reactive Windshear (?)
   4. Envelope Protection (general)
   5. Autoland (general)
   6. Takeoff configuration (general)
   7. (others?)
(e) Avionics Lifecycles
   (i) When Does Avionics get Added or Upgraded?
   (ii) Typical installation timelines (echoing section c.vi.)
(f) Description of Aviation Radio Frequency Systems

(i) System 1 (follow the same order as in section (d))
   1. Name
   2. Frequency Band and Channelization
   3. Description and Operation (how system is used)
   4. Criticality (e.g. TSO DAL) in typical use

(ii) System 2

(iii) …

(iv) System N

(g)