



International Civil Aviation Organization

**NINETEENTH MEETING OF THE COMMUNICATIONS/NAVIGATION
AND SURVEILLANCE SUB-GROUP (CNS SG/19) OF APANPIRG**

Bangkok, Thailand, 20 – 24 July 2015

Agenda Item 7: Aeronautical electromagnetic spectrum utilization

3) Review Report of the Spectrum Review Task Force (SRWG/2)

**OUTCOMES OF THE SECOND MEETING OF THE SPECTRUM REVIEW
WORKING GROUP (SRWG/2) AND ICAO SURVEY**

(Presented by the Secretariat)

SUMMARY

This paper presents the outcomes of the 2nd Spectrum Review Working Group meeting held in Bangkok, Thailand from 12 to 14 May 2015.

1. INTRODUCTION

1.1 The Second Meeting of the Spectrum Review Working Group (SRWG/2) of APANPIRG was held at the ICAO Regional Office facilities in Bangkok, Thailand.

1.2 The meeting was attended by was attended by 17 participants from Australia, Bangladesh, India, Indonesia, Japan, Lao PDR, Malaysia, Singapore, and Thailand.

1.3 The report of the meeting is available here:
<http://www.icao.int/APAC/Meetings/Pages/2015-SRWG2.aspx> .

2. DISCUSSION

Review of relevant meetings/conferences and drafting of SRWG Terms of Reference

2.1 Reviewing the outcomes of CNS SG/18, the meeting noted that 8.33 kHz may not be possible for offset used at extended Remote Control Air/ground Communications (RCAG) stations, but opined that it may remain possible in certain limited configurations, whereby the number of stations participating in the extended VHF would be reduced to 2 or 3.

Review of new Operational needs in VHF communications from States

2.2 Operational needs for new VHF frequencies were collected from States having participated in SRWG/1.

2.3 A total of 255 new frequencies were identified as needed in APAC region, including 224 in the timeframe 2015-2020, and 31 in the timeframe 2020-2025.

2.4 Japan introduced its basic pattern for allocation of VHF Frequencies in Japan whereby a group of 3 to 5 en route sectors are allocated individual frequencies plus one shared spare frequency. It was discussed that the emergency frequency 121.5 MHz is to be used in conditions specified in Annexes 6, 10 and 11. An ad hoc presentation by ICAO was discussed by the meeting and is available here:

http://www.icao.int/APAC/Meetings/2015%20SRWG2/SP03_ICAO%20Emergency%20frequency.pdf

Simulations with Frequency Finder

2.5 Based on the operational needs submitted by States, a heavy work was conducted by ICAO to simulate if any required frequency assignment in the APAC Region for the period up to 2020 (and, as necessary, beyond) can be satisfied while continuing using 25 kHz channel spacing assignments. This was done using Frequency Finder software, and with the latest version of the frequency database available. Mr. Robert Witzel, expert in frequency management retired from ICAO, was thanked for his significant work on the simulations. The outcomes were reviewed by the meeting.

2.6 India noted that the simulations showed available frequencies, but not assignable frequencies as this would take more testing against all the current assignments done in India. Particularly the case of classified assignments, not known by ICAO and therefore missing in the global database, this would probably restrict the number of assignable channels. It was agreed that further testing would be done by India.

2.7 The meeting noted that the accuracy of simulations relied on the relevance of the database and that an effort to have the most comprehensive database should be pursued. All draft assignments identified by SRWG are stored in the global database and therefore protected.

2.8 The outcomes of simulations would also have to be updated on a regular basis based on the new operational needs of the States. For example, ATS authority in India is still projecting further requirements for TWR and APP functions in the next 5 years.

2.9 In terms of risk of congestion, the pool identified by SRWG was expected to provide sufficient space to accommodate future frequency requirements e.g. beyond 2020. It was considered possible to keep using the 25 KHz spacing scheme throughout APAC region in the next 5 years. But it was also discussed that such assessment should be revised on an annual basis.

2.10 It was discussed that a planning mechanism is consistently used by the APAC Region for the future. This mechanism would ensure that:

- Frequencies planned for a use in the next 5 years timeframe would be protected meanwhile. The protection includes protection from interference with neighboring regions as all the planning exercise would be done using the new global database;
- The principle of first come first served would be replaced by an overall strategic planning giving visibility on the spectrum use, and providing equity in the allocation of spectrum.

2.11 While the reserved frequencies are protected, their effective use should start after tactical assignment coordinated with the ICAO Regional Office. In parallel a tactical coordination without strategic planning can always be done with the ICAO Regional Office but should be avoided as much as possible. It decreases the efficiency of the strategic planning and puts uselessly pressure on State, operator and ICAO Regional Office. A revision of the operational needs should be done on an annual basis for a 5-years sliding window so as to plan and mitigate any spectrum congestion sufficiently beforehand.

2.12 Considering the above, the following Draft Conclusion was agreed:

Draft Conclusion 2/1 - Strategic planning and tactical use of VHF frequencies in the APAC Region from 2015 onwards

That, considering that the simulations conducted by SRWG on the basis of the needs submitted, showed that congestion in the APAC region for VHF frequencies using a 25 kHz channel spacing was unlikely to happen until 2020, and considering the necessity to continue using 25 kHz channel spacing as long as possible,

1/ All APAC States should contribute to the strategic planning of VHF frequencies (planned use and release) for a 5-years sliding window so as to detect and mitigate any spectrum congestion sufficiently beforehand and optimize the efficiency of the available spectrum, by submitting and updating their operational needs in terms of VHF frequencies (international and national) on a yearly basis to the ICAO Regional Office;

2/ While the frequencies reserved as a result of strategic planning are protected, their effective use should start after tactical assignment coordinated with the ICAO Regional Office;

3/ The tactical coordination of frequencies without any prior strategic planning should be avoided as much as possible in congested areas;

4/ Both strategic planning and tactical assignments should be completed using the ICAO global tool Frequency Finder; and

5/ Strategic planning should be revised on an annual basis; in case of detected congestion within a 3 years timeframe based on the latest simulations made, the decision to move to 8.33 KHz spacing would need to be made by APANPIRG and implemented in a coordinated manner, after due consultation of airspace users.

Recommendations for improvement of VHF frequency planning

2.13 Concerning the block allotment of frequencies in the frequency band 117.975-137.000 MHz, India noted that the discontinuation of sub-bands may bring in administrative and technical constraints to deal with, considering the classified assignments in these sub-bands for different services and supported continuance of the following block allotment of frequencies to National Aeronautical Mobile Services to meet national allotment requirements. It was discussed by the meeting that the assignment along the allotment plan would remain the main and preferred pattern, and assignment outside allotted sub bands would be done when no other possibility was to be found, in accordance with the revised ICAO Doc 9718.

2.14 Regarding the pool allotment of frequencies, frequency assignments for various functions in the APAC Region are made from separate pools of VHF channels provided in frequency list no.3 as per ASIA/PAC/3/RAN Meeting conclusion 11/4. It was noted by India that ICAO Doc 9718 Volume II Table 2-9 provides minimum geographical co-frequency separation distances between the edges of designated operational coverage (DOC) and a remedy whereby channels from different pools can be considered for assignment. While it was recognized by India that this may help to provide additional channels to cover the shortage to a certain extent, there was a need to exercise caution in APAC region, as existing assignments have not taken consideration of adjacent channel criteria as well as offset carrier effects.

Channel protection

2.15 The meeting discussed that in Europe extensive study had been made to revise the planning criteria for adjacent channel, resulting in the recent abandon of channel protection in a 25 KHz spacing context. Europe had already relaxed the said criteria in its implementation, and a proposal to update to the handbook volume II had been presented in ACP WG-F this year, effective in August 2015. Frequency Finder excludes stations operating with the same channel spacing whose DOC is separated by less than 10 NM when performing a search.

Transition to the new global database

2.16 As Frequency Finder was considered to be a necessary tool for an efficient frequency management across ICAO regions, the need for securing the resources to maintain the tool and organize a SIP to train States was reinforced. Consequently the meeting adopted the following draft conclusion:

Draft Conclusion 2/2 – Transition to the new global database

Considering that Frequency Finder and the global database were a necessary toolkit for an efficient frequency management across ICAO regions, and the need to train States,

That,

a/ ICAO be urged to secure the resources to maintain the tool and organize a seminar on Frequency Finder in 2016,

b/ States secure the attendance of their Subject Matter experts to the Seminar

Backup frequencies

2.17 The use of back-up frequencies especially for TWR, APP and ACC functions requires moderation. Presently, there are no SARPs or guidelines for backup frequencies in ICAO Annex Volume V and Doc 9718. During the course of web conferences and email discussions, the secretariat circulated excerpts from Eurocontrol document. Section 2.7 of Part 2: "COM2 Best Practices" throw some light on the issue. In the absence of credible guidelines, the irrational use of back up frequencies is increasing which would lead to artificial shortfall of frequencies.

2.18 Guidance material on the use of backup frequencies based on the practices in the EUR Region was presented to the meeting by Secretariat and reviewed. The outcome is placed at Appendix B. Noting that the operational feasibility may not be ensured in all cases, but that the

guidance would be quite useful to regulate the assignment of back up frequencies, the meeting adopted the following draft Conclusion

Draft Conclusion 2/3 – Assignment of back up frequencies in APAC Region

Considering that the assigned number of backup frequencies should be kept to a minimum,

That,

1/ the guidance placed at **Appendix B** be adopted as regional guidance;

2/ any State/Administration requiring back up frequencies, where operationally feasible:

- Shares backup frequencies either between different services (at the same ATC center) or between different facilities (e.g. different aerodromes or different ACC/FIS serves from different ATC centers).
- Follows the regional guidance for the backup frequencies to be assigned,
- Re-coordinates the backup frequencies already assigned as necessary.

2.19 In order to ease the submission of arguments backing the request for back up frequencies, Secretariat proposed to develop a template. The template would allow justifying the operational requirement, and summarizing the main lines of the safety case, backed on quantified data.

2.20 WP/02 introduced actions to take in the APAC Region regarding the aeronautical emergency frequency (121.500 MHz), the aeronautical auxiliary frequency SAR (123.100 MHz) and the air-to-air frequency (123.450 MHz).

Aeronautical emergency frequency

2.21 Regarding the aeronautical emergency frequency, the meeting agreed to the following draft conclusion:

Draft Conclusion 2/4 – Amendment to the APAC frequency allotment plan

That, considering the effect of the reduction of the guard band around the frequency 121.500 MHz and the four new channels that can be used for ATC communications, and the necessity to map services previously defined in APAC region under ASIA/PAC/3 RAN conclusion 11/4 and ASIA/PAC/3 RAN

a/ the frequency allotment plan for the APAC Region be modified as follows:

Current allotment	Current frequency band	New frequency band
APP-I	121.100 – 121.400 MHz	121.100 – 121.450 MHz
AS (aerodrome surface)	121.600 – 121.975 MHz	121.550 – 121.975 MHz

b/ coordination be undertaken with ACP WG/F to update the ICAO Doc 9718 Volume II accordingly.

c/ the mapping between the services and designated operational coverages previously defined in APAC region under ASIA/PAC/3 RAN conclusion 11/4 and those defined in the global Database as per **Appendix C** be adopted.

Global and Regional Allotments

2.22 Different measures envisaged at the global level regarding allotments in the VHF-COM frequency band 117.975 – 137 MHz to increase the efficiency of frequency management were discussed for the APAC Region.

- Measure 1: Abandon the discrimination between national and international aeronautical mobile services within the band 117.975 – 137 MHz and consequently amend Annex 10, and Secretariat was tasked to do a survey on the topic.
- Measure 2: Replace the notion of “protected service volume” with the definition for Designated Operational Coverage
- Measure 3: Revise the allotment plan in APAC Region, based on handbook volume II principles
 - 3a: reduction of the band for AOC
 Current allotment is as follows in the different ICAO regions:
 - a. AFI: 131.400 – 132.975 MHz
 - b. APAC: 128.900 – 132.025 MHz
 - c. CAR/SAM: 129.900 – 132.025 MHz
 - d. EUR: 131.400 – 131.975 MHz
 - e. MID: 128.900 – 132.025 MHz

The meeting agreed that a proposal could be circulated to the APAC States to reduce the band for AOC:

A-Proposed new sub band for ATS services in APAC 128.900 - 131.375 MHz,
 B-Existing assigned AOC frequencies in this sub-band are subject to coordination, if required, between the Member State and ICAO regional office.

- 3b: in cases where allotment restricts efficient frequency assignment planning, specific services may use other frequency bands. This was considered to be the case already in the handbook volume II, which would become guidance for the region when the new eANP would be adopted (end 2015). No follow-up was considered necessary.
- 3c: incorporate in the APAC allotment plan the relevant DOC when missing. An action was raised for ICAO to do a proposal for AOC DOC.

- 3d: allot the sub-band 122.000 MHz – 123.575 MHz to TWR, AFIS and AS. This was considered to be covered by the project of ICAO State letter. No follow-up was considered necessary.
- 3e: introduce ATC services in a sub-band of 136.000 – 137.000

Outcomes of ICAO Survey for measures 1 and 3a

2.23 The outcomes are placed at Attachment A.

Harmonic interference

2.24 The meeting opined that potential cases of harmonic interference could be flagged for further analysis by the expert using the tool.

Maintenance of Frequency database in the Frequency Finder

2.25 Japan presented the result of the comparison between their national VHF frequency database, the frequency list 3 issued by the ICAO regional office in January 2015, and the content of the global database. The outcome is that there are discrepancies between the national VHF frequency database and the frequency list 3 which can be explained because not all assignments were coordinated, or were coordinated after assignment and found not suitable by ICAO. There were also discrepancies between the frequency list 3 and the content of the global database, although the source of data was unique in that case. The reasons for those gaps were that in the global database the functions had been harmonized and in some cases different from the ones used in APAC region.

2.26 The meeting agreed that a comprehensive cross check would be done and was planned for end 2015.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to:
- a) note the information contained in this paper; and
 - b) note the results of Outcomes of ICAO Survey for measures 1 and 3a
 - c) discuss and agree to the draft conclusions and decisions
 - d) discuss any relevant matters as appropriate.

ATTACHMENT A: outcomes of Survey: ICAO State letter AP087/15

State/Administration	Survey on National/international	Survey on AOC sub band
Australia	No objection	No objection, with controls for frequency assignment and protection remaining
Bhutan	No comment	No comment
China	No comment	No comment
France	Favorable	Favorable
Japan	No comment	It is basically agreeable. However, objection if it will be mandatory; existing AOC fq must be protected as the newly assigned ATS frequencies
HKC	No comment	No comment: might not be always feasible
Macao China	No comment	No comment
Malaysia	No objection	No objection
New Zealand	support	support
Pakistan	No comment	No comment
Philippines	No objection	Comment: new ATS frequencies allocated by neighbors should be coordinated with CAAP
Republic of Korea	No comment	Objection: Many frequencies (about 440) in this band have been used for AOC by all airline companies and other related companies: a lot of manpower and cost would be expected for frequency adjustment
Samoa	No comment	No comment
Singapore	No comment	No objection: ICAO RO to consider including actions which States can take when all available fq are assigned
Viet Nam	No comment	No comment

State/Administration	Survey on National/international	Survey on AOC sub band
USA	No comment	Objection: AOC band congested, not the same protection for co-channel, band managed by third part