International Civil Aviation Organization

SEVENTH MEETING OF SPECTRUM REVIEW WORKING GROUP (SRWG/7)

Bangkok, Thailand, 15 – 17 February 2023

Agenda Item 6: Frequency Interference in the Region

ADDRESSING FREQUENCY INTERFERENCE IN APAC REGION

(Presented by the Secretariat)

SUMMARY

This paper presents ICAO framework in dealing with aeronautical frequency interference and latest updates in APAC region.

1. INTRODUCTION

1.1 Aeronautical services are recognized internationally to be prime users of radio frequencies without which aircraft operations would not be capable of meeting the global demand for safe, efficient and cost-effective transport. The prominent safety-of-life element, present during all phases of an aircraft's flight, is accorded special treatment internationally and is granted protection from harmful interference through agreed measures.

1.2 The ITU Radio Regulations also regulate the prevention and removal of interference, whether between services, countries or regions, between frequency assignments, or from other sources of radiation such as industrial or medical equipment. Particular attention is accorded to services that have a predominant critical safety-of-life function, such as aeronautical and radionavigation services. This is reflected in special measures for rapid elimination of interference by national telecommunication authorities or, in case interference is affecting two or more States, through bilateral negotiations with authorities in these States. Other special measures such as the use of radio in distress and emergency situations or for search and rescue operations, in collaboration with maritime and land services as necessary, are also given prominent treatment.

1.3 With the recovery of air traffic from the COVID-19 impact, insufficient frequency coordination between civil aviation administrations and ICAO APAC Office may potentially increase the frequency interference to aeronautical services.

1.4 This paper mainly discusses some activities in dealing with the interference issues observed and reported in APAC region, as well as the practice to resolve or mitigate the operational risks concerned.

2. DISCUSSION

2.1 The increasing use of radio spectrum has resulted in an increasing occurrence of interference to aeronautical radio services. This interference has been known to occur from many sources. The international civil aviation community had adopted technical protection criteria against the "aeronautical-to-aeronautical" harmful interference, and that there was comprehensive and significant assurance provided through the co-ordination between civil aviation administrations with ICAO as its focal point.

2.2 Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718) Volume I, ICAO spectrum strategy, policy statements and related information, Second Edition — 2018, describes the elements of a framework of rules and preventative measures for the regulation and control of interference in Chapter 9.

2.3 Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718) Volume II, Second Edition, 2022, provides Frequency assignment planning criteria for aeronautical radio communication and navigation systems.

2.4 The reporting of interference incidents is an important part of any programme aimed at prevention and cure. In general, aircrew and air traffic control staff are more likely the first people to be aware of interference, particularly on voice communications services. The APAC region established a reporting procedure in the ASIA/PAC/3 Regional Air Navigation Meeting in 1993, which was designed to serve two purposes: a) to ensure that any immediate operational difficulties can be cleared, or at least alleviated; b) to ensure that accurate statistical records are compiled.

2.5 Interference issues have been continuously discussed and shared on regional platforms from time to time by joint meeting with regulator, papers from Secretariat and Member States, including:

- the Asia Pacific Telecommunity (APT) HF Interference and BSS Replanning Meeting in 1998, to enable the APT Members to discuss and seek solutions to the interference problem in maritime and aeronautical services in the High Frequency (HF) bands and replanning of BSS (Broadcasting Satellite Service);

- WP/04 of SRWG/1 presented the reporting FORM for radio interference in its Attachmen 1A and 1B; https://www.icao.int/APAC/Meetings/Pages/2014-SRWG1.aspx

- IP/04 of SRWG/5 presented Status Report of Radio Frequency Interference in the Band 117.975 – 137 MHz by Thailand; https://www.icao.int/APAC/Meetings/Pages/2021_SRWG5.aspx

- IP/6 of SURICG/3 presented VHF Interference caused by MSSR by China; https://www.icao.int/APAC/Meetings/Pages/2018-SURICG3.aspx

- WP/17 of CNS SG/23 presented Potential Interference to Aeronautical Spectrum from LED Products by India; https://www.icao.int/APAC/Meetings/Pages/2019-CNS-SG23.aspx

2.6 APANPIRG formulated various Conclusions to address interference, some of them are highlighted as follows: Conclusion 3/17 Elimination of VHF Interference Problem, Conclusion 8/43 GNSS Frequency Based Interference, Conclusion 9/32 GNSS Frequency Protection, Conclusion 17/31 RF interference on the protected DME frequency, Conclusion 17/32 HF Interference, Conclusion 22/28 Protection of aviation utility of GNSS, Conclusion 27/36 Protection of GNSS signal against jamming. The detailed information may refer to the WP12 of CNS SG/26.

https://www.icao.int/APAC/Meetings/Pages/2022-CNS-SG-26.aspx

2.7 DGCA/57 highlighted that Communications, Navigation and Surveillance (CNS) technology elements rely on a common resource - continued and interference-free access to frequency spectrum, for aviation safety, capacity and efficiency. The Conference urged States to coordinate frequency and SSR IC use with the ICAO APAC Office to ensure the frequency and IC lists are correct and up to date.

2.8 The ICAO APAC Regional Office issued the State Letter Ref.: T 8/5.10 : AP099/22 (CNS) dated 21 July 2022, Subject *Prevention of harmful interference to Radio Navigation Satellite Service Receivers in the 1559 – 1610 MHz frequency band*, to share the information with operators, service providers, and all stakeholders, sensitize the national radio regulatory Authority to the risk encountered by the civil aviation, and encourage States/Administrations to take actions to address this critical issue as appropriate.

2.9 In any case, ICAO holds the view that frequency assignments that have been coordinated with ICAO have priority over those that have not been coordinated. Once the records in ICAO couldn't tell which Member coordinated and registered first, the Regional Office would invite States concerned to reach a mutual agreement on resolving the interference issue and update the registration with ICAO and concerned AIP.

2.10 The interference issue concerned for international operations is mainly reported to ICAO APAC Regional Office by focal point in States/Administrations, i.e., the *ICAO APAC Point of Contact on Frequency Affairs* maintained by SRWG. The coordination from ICAO APAC Regional Office is also directed to the focal point of the concerned States/Administrations. The ICAO APAC Regional Office coordinated to resolve VSAT interference issue between two States, VHF COM interference issue among six States through this established mechanism in 2022.

2.11 The reporting States/Administrations are suggested to provide required information as per the Attachment 1A to SRWG/1 – WP/4, in practice, the clarification on the reported incident can be done by the correspondence between ICAO Regional Officer and the focal point.

2.12 The reporting States/Administrations should also preview the received VHF COM interference incidents against the Doc 9718 Volume II, Chapter 1, 1.3.2.2, to note that the propagation of radio waves in the VHF and UHF frequency bands is subject to a number of additional conditions compared to the free-space transmission loss.

2.13 The ICAO APAC Regional Office was asked about the NDB frequency assignment solution for ocean going ship. After coordination with TO/HQ and manufacturer, the main points for considerations are:

- There are few NDB installations on ships, usually to install as required by administration.
- NDBs on ships mainly work at the high end of the frequency band to avoid the frequency spots used by NDBs on the land. Transmitting power is relatively low.
- Antenna in small size with limited coverage.
- Operate in specified area to support helicopter, working hour is limited for each task.
- Easy to change its working frequency if interference happens.
- ICAO APAC Office can also share NDB list (Frequency List No.1) to the ship to help avoiding potential interference in the region.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) encourage States and airspace users to report frequency interference as soon as possible if the occurrence impacts international operations;

c) urge States to cooperate with the Regional Office to optimize the use of aeronautical spectrum to eliminate any harmful interference; and

d) discuss any relevant matter as appropriate.

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