Civil Aviation Authority of Bangladesh
Flight Standard and Regulations Department
ANS Inspection Division
Headquarters; Kurmitola; Dhaka 1229

No. 30.31.0000.000.117.40.0003.26- 475 Date: 08/10/2026

Subject: **Stakeholders Comments/Opinions for Draft Amendment of ANO 10, Vol: 1 to 5**

1. A draft amendment to ANO 10 , Vol: 1 to 5 has been prepared with a view to incorporating the proposed amendments to the Annex 10, Vol: 1 to 5 and ensuring the continued compliance and effectiveness of the applicable aviation regulatory provisions.

2. In this regard, comments/opinions are hereby invited from aviation stakeholders and/or members of the public on the proposed draft amendment. All concerned are requested to review the draft and provide their comments, observations, and opinions, if any, for consideration during the amendment process. Comments/opinions may be submitted to the undersigned.

3. All comments/opinions received will be duly considered in the process of finalizing the proposed amendment. Your valuable comments and constructive feedback are highly appreciated.

Yours Sincerely,

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Amendment 1 to the Air Navigation Order (ANO), "ANO-10 Vol-5 on Aeronautical Radio Frequency Spectrum Utilization" in order to incorporate Amendment 91 to Annex 10 Volume V to the Convention on International Civil Aviation:

Civil Aviation Authority of Bangladesh
GAZETTE
Dated: , Dhaka

In exercise of the power conferred by section 47, read with section 14 of the Civil Aviation Act 2017 (Act No 18 of 2017), hereinafter referred as the "act", the Chairman of the Civil Aviation Authority of Bangladesh is pleased to make Amendment 1 to the Air Navigation Order (ANO), "ANO-10 Vol-5 on Aeronautical Radio Frequency Spectrum Utilization" in the following manner, namely: —

1. **New definitions shall be inserted under regulation 1.3, namely: —**

   "***WAIC component.*** Any tangible entity of a WAIC network on board an aircraft.

   WAIC network. A network comprised of interrelated WAIC components, such as components used for wireless communications, security or network management.

   WAIC system. A system which provides wireless communications between points on board a single aircraft. A WAIC system may be comprised of one or more WAIC networks necessary for establishing, maintaining and securing wireless communications. A WAIC system consists of interrelated sets of WAIC components on board the same aircraft, so that a single aircraft contains only a single WAIC system.

   Wireless avionic intra-communications (WAIC). Radiocommunication between two or more aircraft stations located on board a single aircraft for aircraft applications supporting the safe operation of the aircraft."

2. **The existing text of regulation 4.2.1 shall be replaced by the following new text, namely: —**

   "4.2.1 The block allotment of the frequency band 108 – 117.975 MHz shall be as follows:

   — Band 108 – 111.975 MHz:

   a) ILS in accordance with 4.2.2 and ANO 10, Volume I, 3.1.3, provided that only frequencies ending in odd tenths of a megahertz or odd tenths plus a twentieth of a megahertz are used;

   b) VOR provided that:
   only frequencies ending in either even tenths or even tenths plus a twentieth of a megahertz are used; and

   c) GNSS ground-based augmentation system (GBAS) in accordance with ANO 10, Volume I, 3.7.3.5.

   — Band 111.975 – 117.975 MHz:

   a) VOR;

   b) GNSS ground-based augmentation system (GBAS) in accordance with Annex 10, Volume I, 3.7.3.5.

   Note 1.— Guidance material relating to the distance separation required to prevent harmful interference between ILS, VOR and GBAS/VDB when using the band 108 – 111.975 MHz is found in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc. 9718, Volume II).

   Note 2.— Guidance material relating to the distance separation required to prevent harmful interference between VOR and GBAS when using the band 112.050 – 117.900 MHz is found in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc. 9718, Volume II)."

3. The existing text of regulation 4.2.2 shall be replaced by the following new text, namely: —

"4.2.2 For regional assignment planning, the frequencies for ILS facilities shall be selected in the following order:

a) localizer channels ending in odd tenths of a megahertz and their associated glide path channels;

b) localizer channels ending in odd tenths plus a twentieth of a megahertz and their associated glide path channels.

4.2.2.1 ILS channels identified by localizer frequencies ending in an odd tenth plus one twentieth of a megahertz in the band 108 – 111.975 MHz shall be permitted to be utilized on the basis of regional agreement for general use on or after 1 January 1976."

4. The existing text of regulation 4.2.3.1 shall be replaced by the following new text, namely: —

"4.2.3.1 Frequencies for VOR facilities ending in even tenths plus a twentieth of a megahertz in the band 108 – 111.975 MHz and all frequencies ending in 50 kHz in the band 111.975 – 117.975 MHz shall be permitted to be utilized for general use on the basis of a regional agreement when they have become applicable in accordance with the following:

a) in the band 111.975 – 117.975 MHz at least one year after the approval of the regional agreement concerned;

b) in the band 108 – 111.975 MHz giving a period of two years or more after the approval of the regional agreement concerned."

5. The existing text of Note of regulation 4.2.5 shall be replaced by the following new text, namely: —

"*Note.— Guidance material on this subject is contained in the* Handbook on Radio Frequency Spectrum Requirements for Civil Aviation *(Doc 9718, Volume II)."*

6. The existing text of Note of regulation 4.3 shall be replaced by the following new text, namely: —

"*Note. 1— Guidance on the frequency planning of channels for DME systems is given in the* Handbook on Radio Frequency Spectrum Requirements for Civil Aviation *(Doc 9718, Volume II)"*

7. A new regulation 4.5 shall be inserted after regulation 4.4, namely: —

4.5 Utilization in the frequency band 4 200–4 400 MHz

4.5.1 Utilization for radio altimeters - (To be developed)

4.5.2 Utilization for wireless avionic intra-communication (WAIC) systems

Note.— The following provisions for WAIC define the requirements that ensure that WAIC systems and radio altimeters can provide their intended functions while multiple aircraft are in mutual radio range. Coexistence between WAIC systems and radio altimeters installed on board the same aircraft is addressed by the specific implementation and established airworthiness certification processes. Further guidance on those implementation issues is addressed in ED-319 and DO-402 Minimum Operating Performance Specification (MOPS) for Wireless Avionics Intra-Communication Equipment within 4200-4400 MHz. In addition, considerations on protecting aircraft systems from unauthorized interactions are addressed in ED-203A and DO-356A Airworthiness Security Methods and Considerations.

4.5.2.1 WAIC systems shall only be used for communications related to the safety and regularity of flight between two or more points on a single aircraft.

4.5.2.2 WAIC systems shall not cause harmful interference to radio altimeter systems and WAIC systems on other aircraft.

Note.— Compliance with 4.5.2.2 is achieved by limiting the power of WAIC emissions below the level at which altimeter performance may be affected, consistent with 4.5.2.4 below. Furthermore,

careful consideration is necessary when accommodating components of the WAIC system located outside of the aircraft fuselage. The Eurpean Organisation for Civil Aviation Equipment (EUROCAE)/RTCA Inc. documents ED-260A/DO-378A provide one acceptable method of demonstrating compliance with that power limit.

4.5.2.3 A WAIC system located on board one aircraft shall perform its intended function while subject to emissions from WAIC and radio altimeter systems located on board other aircraft.

Note.— EUROCAE/RTCA documents ED-260A/DO-378A provide one acceptable method of demonstrating compliance with 4.5.2.3 via test. Alternatively, the critical coexistence scenario described in those documents may also be used to develop appropriate analyses to demonstrate compliance with 4.5.2.3.

4.5.2.4 Radio frequency (RF) characteristics of WAIC systems.

4.5.2.4.1 WAIC systems shall operate in the frequency band 4 200–4 400 MHz.

4.5.2.4.2 The power of the total aggregate emissions of all WAIC transmitters on board an aircraft shall not exceed an equivalent isotropic radiated power of -20 dBm, referenced to a point source, which is assumed to be located at the geometrical centre of the aircraft.

Note.— Refer to ED-260A and DO-378A "the Minimum Aviation System Performance Standards (MASPS) for Coexistence of Wireless Avionics Intra Communication (WAIC) Systems within 4 200-4 4008 MHz", which adopt the total aggregate EIRP limit for WAIC systems and provide a practical verification procedure how to ascertain whether the limit is satisfied.

4.5.2.4.3 The overall occupied bandwidth shall be maintained completely within the allocated frequency band 4 200–4 400 MHz including any offsets such as Doppler shift or frequency tolerances, where the occupied bandwidth is defined as the bandwidth for which 99 per cent of the signal energy falls within the lower and upper frequency limits.

Note.— The ITU Radio Regulations define the occupied bandwidth as "The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage β/2 of the total mean power of a given emission", the value of β/2 being 0.5 per cent.

4.5.2.4.4 The necessary bandwidth (NB) of the WAIC transmitter shall be calculated according to Appendix 1 of the ITU Radio Regulations.

4.5.2.4.5 The boundary between the out-of-band and spurious domains shall be determined according to Annex 1, Appendix 3 of the ITU Radio Regulations. The required attenuation of the mean power of any unwanted emission relative to the total mean power P shall meet or exceed the following conditions:

50 per cent of NB < f < 150 per cent of NB: Linear increase (in dB) from 24dB to 35dB within a reference bandwidth of 4kHz (Note 1);

150 per cent of NB < f < start of the spurious domain: 35 dB within a reference bandwidth of 4 kHz (Note 1); and

Spurious domain: 56+10log(P) or 40 dB, whichever is less stringent, measured in a reference bandwidth of 1 MHz (Note 2).

Note 1.— Reference bandwidth of 4 kHz within the out-of-band domain in accordance with Annex 11, Recommendation ITU-R SM.1541-6 of the ITU Radio Regulations. The parameter f is the frequency separation from the centre frequency of the transmit signal.

Note 2.— Reference bandwidth of 1 MHz within the spurious domain in accordance with Appendix 3, paragraph 7 of the ITU Radio Regulations and determination of attenuation for low power device radio equipment in accordance Appendix 3, paragraph 13 of the ITU Radio Regulations.

4.5.2.5 Out-of-band interference tolerance of a WAIC receiver

Note.— These requirements describe the out-of-band tolerance in which the WAIC receiver must meet its performance requirements without taking into account any mitigation afforded by its installation.

4.5.2.5.1 Receivers shall tolerate interference from sources operating outside of the frequency band 4200–4400 MHz whose total combined emitted power falling within the frequency band 4200–4400 MHz as measured at the receiver does not exceed a power spectral density of -120 dBm/MHz.

4.5.2.5.2 Receivers shall tolerate interference from sources operating outside of the frequency band 4 200–4 400 MHz whose total combined power as measured at the receiver does not exceed -20 dBm.

8. **This Amendment 1 to the Air Navigation Order (ANO), "ANO-10 Vol-5 on Aeronautical Radio Frequency Spectrum Utilization" shall come into force on the date of publication in the Official Gazette**.

Air Vice Marshal Md. Mostafa Mahmood Siddiq
BSP, GUP, ndc, afwc, acsc, psc
Chairman
Civil Aviation Authority of Bangladesh

Summary of Changes

Annex 10, Volume V — Amendment 91 (Aeronautical Radio Frequency Spectrum Utilization)

This table summarizes the changes introduced by Amendment 91 to Annex 10, Volume V (Aeronautical Radio Frequency Spectrum Utilization).

Type of change	Location	Existing text	Amended text	Comment
New text to be inserted	Chapter 1, Definitions	-	WAIC component. Any tangible entity of a WAIC network on board an aircraft. WAIC network. A network comprised of interrelated WAIC components, such as components used for wireless communications, security or network management. WAIC system. A system which provides wireless communications between points on board a single aircraft. A WAIC system may be comprised of one or more WAIC networks necessary for establishing, maintaining and securing wireless communications. A WAIC system consists of interrelated sets of WAIC components on board the same aircraft, so that a single aircraft contains only a single WAIC system. Wireless avionic intra-communications (WAIC). Radiocommunication between two or more aircraft stations located on board a single aircraft for aircraft applications supporting the safe operation of the aircraft.	Insert new definitions
New text to be inserted	4.2.1, Band 108–111.975 MHz, a)	a) ILS in accordance with 4.2.2 and Annex 10, Volume I, 3.1.3;	a) ILS in accordance with 4.2.2 and Annex 10, Volume I, 3.1.3, provided that only frequencies ending in odd tenths of a megahertz or odd tenths plus a twentieth of a megahertz are used;	New text inserted
Text to be deleted	4.2.1, Band 108–111.975 MHz, b) 1)	1) no harmful adjacent channel interference is caused to ILS;	—	Sub-item 1) deleted; sub-item 2) is retained (see next row).
New text to replace existing text	4.2.1, Band 108–111.975 MHz, b) 2)	2) only frequencies ending in either even tenths or even tenths plus a twentieth of a megahertz are used.;	only frequencies ending in either even tenths or even tenths plus a twentieth of a megahertz are used; and	Item is no longer numbered "2)" since sub-item 1) is deleted.
Text to be deleted	4.2.1, Band 108–111.975 MHz, c)	c) GNSS ground-based augmentation system (GBAS) in accordance with Annex 10, Volume I, 3.7.3.5, provided that no harmful interference is caused to ILS and VOR.	c) GNSS ground-based augmentation system (GBAS) in accordance with Annex 10, Volume I, 3.7.3.5.	Some text deleted
Text to be deleted	Note following 4.2.1 c) (Band 108–111.975 MHz)	Note.— ILS/GBAS geographical separation criteria and geographical separation criteria for GBAS and VHF communication services operating in the 118 – 137 MHz band are under development. Until these criteria are defined and included in the SARPs, it is intended that frequencies in the band 112.050 – 117.900 MHz will be used for GBAS assignments.	—	Entire Note deleted.
Text to be deleted	4.2.1, Band 111.975–117.975 MHz, b)	b) GNSS ground-based augmentation system (GBAS) in accordance with Annex 10, Volume I, 3.7.3.5, provided that no harmful interference is caused to VOR.	b) GNSS ground-based augmentation system (GBAS) in accordance with Annex 10, Volume I, 3.7.3.5.	—

Type of change	Location	Existing text	Amended text	Comment
New text to replace existing text	Note 1 (following 4.2.1)	...interference between ILS, and VOR when using the band 108 – 111.975 MHz is found in Section 3 of Attachment C to Annex 10, Volume I.	...interference between ILS, VOR and GBAS/VDB when using the band 108 – 111.975 MHz is found in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc. 9718, Volume II).	—
New text to replace existing text	Note 2 (following 4.2.1)	...when using the band 112.050 – 117.900 MHz is found in Section 7.2.1 of Attachment D to Annex 10, Volume I.	...when using the band 112.050 – 117.900 MHz is found in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc. 9718, Volume II).	—
New text to replace existing text	4.2.2.1	...shall be permitted to be utilized on the basis of regional agreement when they become applicable in accordance with the following: a) for restricted use commencing 1 January 1973; b) for general use on or after 1 January 1976. Note.— See Note to 4.2.3.1.	...shall be permitted to be utilized on the basis of regional agreement for general use on or after 1 January 1976.	Sub-items a), b) and the Note are deleted as part of the replacement.
New text to replace existing text	4.2.3.1	...shall be permitted to be utilized on the basis of a regional agreement when they have become applicable in accordance with the following: a) in the band 111.975 – 117.975 MHz for restricted use; b) for general use in the band 111.975 – 117.975 MHz at a date fixed by the Council but at least one year after the approval of the regional agreement concerned; c) for general use in the band 108 – 111.975 MHz at a date fixed by the Council but giving a period of two years or more after the approval of the regional agreement concerned.	...shall be permitted to be utilized for general use on the basis of a regional agreement when they have become applicable in accordance with the following: a) for general use in the band 111.975 – 117.975 MHz at least one year after the approval of the regional agreement concerned; b) for general use in the band 108 – 111.975 MHz giving a period of two years or more after the approval of the regional agreement concerned.	Former item a) ("restricted use") deleted; former b) and c) renumbered a) and b).
Text to be deleted	Note to 4.2.3.1	Note.— "Restricted use", where mentioned in 4.2.2.1 a) and 4.2.3.1 a), is intended to refer to the limited use of the frequencies by only suitably equipped aircraft and in such a manner that: a) the performance of ILS or VOR equipment not capable of operating on these frequencies will be protected from harmful interference; b) a general requirement for the carriage of ILS or VOR airborne equipment capable of operation on these frequencies will not be imposed; and c) operational service provided to international operators using 100 kHz airborne equipment is not derogated.	—	Entire Note and its sub-items deleted.
New text to replace existing text	Note following 4.2.5	Note.— Guidance material on this subject is contained in the Attachments to this Annex.	Note.— Guidance material on this subject is contained in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718, Volume II).	—
New text to replace existing text	Note following 4.3 heading	Note.— Guidance on the frequency planning of channels for DME systems is given in the Annex 10, Volume I, Attachment C, Section 7.	Note.— Guidance on the frequency planning of channels for DME systems is given in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718, Volume II).	—
New text to be inserted	Chapter 4, new Section 4.5	—	4.5 – Utilization in the frequency band 4 200–4 400 MHz, 4.5.1 Utilization for radio altimeters (to be developed)	Entire 4.5.2 is newly inserted

Type of change	Location	Existing text	Amended text	Comment
			4.5.2 Utilization for wireless avionic intra-communication (WAIC) systems *Note.— The following provisions for WAIC define the requirements that ensure that WAIC systems and radio altimeters can provide their intended functions while multiple aircraft are in mutual radio range. Coexistence between WAIC systems and radio altimeters installed on board the same aircraft is addressed by the specific implementation and established airworthiness certification processes. Further guidance on those implementation issues is addressed in ED-319 and DO-402 Minimum Operating Performance Specification (MOPS) for Wireless Avionics Intra-Communication Equipment within 4200-4400 MHz. In addition, considerations on protecting aircraft systems from unauthorized interactions are addressed in ED-203A and DO-356A Airworthiness Security Methods and Considerations.* 4.5.2.1 WAIC systems shall only be used for communications related to the safety and regularity of flight between two or more points on a single aircraft. 4.5.2.2 WAIC systems shall not cause harmful interference to radio altimeter systems and WAIC systems on other aircraft. *Note.— Compliance with 4.5.2.2 is achieved by limiting the power of WAIC emissions below the level at which altimeter performance may be affected, consistent with 4.5.2.4 below. Furthermore, careful consideration is necessary when accommodating components of the WAIC system located outside of the aircraft fuselage. The European Organisation for Civil Aviation Equipment (EUROCAE)/RTCA Inc. documents ED-260A/DO-378A provide one acceptable method of demonstrating compliance with that power limit.* 4.5.2.3 A WAIC system located on board one aircraft shall perform its intended function while subject to emissions from WAIC and radio altimeter systems located on board other aircraft. *Note.— EUROCAE/RTCA documents ED-260A/DO-378A provide one acceptable method of demonstrating compliance with 4.5.2.3 via test. Alternatively, the critical coexistence scenario described in those documents may also be used to develop appropriate analyses to demonstrate compliance with 4.5.2.3.* 4.5.2.4 Radio frequency (RF) characteristics of WAIC systems.	

Type of change	Location	Existing text	Amended text	Comment
			4.5.2.4.1 WAIC systems shall operate in the frequency band 4 200–4 400 MHz. 4.5.2.4.2 The power of the total aggregate emissions of all WAIC transmitters on board an aircraft shall not exceed an equivalent isotropic radiated power of -20 dBm, referenced to a point source, which is assumed to be located at the geometrical centre of the aircraft. *Note.— Refer to ED-260A and DO-378A "the Minimum Aviation System Performance Standards (MASPS) for Coexistence of Wireless Avionics Intra Communication (WAIC) Systems within 4 200-4 4008 MHz", which adopt the total aggregate EIRP limit for WAIC systems and provide a practical verification procedure how to ascertain whether the limit is satisfied.* 4.5.2.4.3 The overall occupied bandwidth shall be maintained completely within the allocated frequency band 4 200–4 400 MHz including any offsets such as Doppler shift or frequency tolerances, where the occupied bandwidth is defined as the bandwidth for which 99 per cent of the signal energy falls within the lower and upper frequency limits. *Note.— The ITU Radio Regulations define the occupied bandwidth as "The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage β/2 of the total mean power of a given emission", the value of β/2 being 0.5 per cent.* 4.5.2.4.4 The necessary bandwidth (NB) of the WAIC transmitter shall be calculated according to Appendix 1 of the ITU Radio Regulations. 4.5.2.4.5 The boundary between the out-of-band and spurious domains shall be determined according to Annex 1, Appendix 3 of the ITU Radio Regulations. The required attenuation of the mean power of any unwanted emission relative to the total mean power P shall meet or exceed the following conditions: 50 per cent of NB < f < 150 per cent of NB: Linear increase (in dB) from 24dB to 35dB within a reference bandwidth of 4kHz (Note 1); 150 per cent of NB < f < start of the spurious domain: 35 dB within a reference bandwidth of 4 kHz (Note 1); and	

Type of change	Location	Existing text	Amended text	Comment
			Spurious domain: 56+10log(P) or 40 dB, whichever is less stringent, measured in a reference bandwidth of 1 MHz (Note 2). *Note 1.— Reference bandwidth of 4 kHz within the out-of-band domain in accordance with Annex 11, Recommendation ITU-R SM.1541-6 of the ITU Radio Regulations. The parameter f is the frequency separation from the centre frequency of the transmit signal.* *Note 2.— Reference bandwidth of 1 MHz within the spurious domain in accordance with Appendix 3, paragraph 7 of the ITU Radio Regulations and determination of attenuation for low power device radio equipment in accordance Appendix 3, paragraph 13 of the ITU Radio Regulations.* 4.5.2.5 Out-of-band interference tolerance of a WAIC receiver *Note.— These requirements describe the out-of-band tolerance in which the WAIC receiver must meet its performance requirements without taking into account any mitigation afforded by its installation.* 4.5.2.5.1 Receivers shall tolerate interference from sources operating outside of the frequency band 4200–4400 MHz whose total combined emitted power falling within the frequency band 4200– 4400 MHz as measured at the receiver does not exceed a power spectral density of -120 dBm/MHz. 4.5.2.5.2 Receivers shall tolerate interference from sources operating outside of the frequency band 4 200–4 400 MHz whose total combined power as measured at the receiver does not exceed -20 dBm.	