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(clean version)

Title	Aeronautical Satellite communication technologies and systems operating in VHF frequency band	Reference	[CP-DCIWG.011.01]
Source	DCIWG/05		
Problem Statement	The limitations of line of sight communications have placed constraints on the use of the VHF frequency spectrum and more specifically VHF voice/datalink. A number of States along with industry are currently investigating the potential for applying space-based VHF in oceanic or remote areas. In this context, there are no technical studies nor provisions for the space-based VHF to support the ICAO position to ITU-R WRC-23, Agenda Item 1.7..		
Specific Details	Spectrum availability is governed on a world-wide basis by the ITU Radio Regulations, as amended every four years by ITU World Radiocommunication Conferences (WRC). One WRC Agenda Item currently being studied in preparation for the upcoming WRC (WRC-23, November 2023) is the provision of aeronautical VHF services by low-earth-orbit satellite (also known as space-based VHF). In support of ICAO position to WRC-23, technical studies for space-based VHF should be completed and validated. This includes the necessary studies on interference analysis and spectrum compatibility. Depending on the outcome of the technical studies' validation and WRC-23 resolution, in support of space-based VHF, detailed provisions, including the Doppler shift and scintillation effects, will be required in Annex 10, Volumes III and V.		
GANP/GASP Link			
Expected Benefits	The implementation of new air-ground communications technologies will involve minimal or no change to existing avionics equipment and configurations, including cabling, power, antennae, etc, and this be a good gain for the industry and the regions for global adoption and implementation. VHF communications, using the existing VHF radios and other avionics aboard the aircraft can be leveraged in the remote/oceanic airspace, especially when in synergy with satellite-based ADS-B, this will make a seamless transition between space-based VHF and conventional VHF possible		

	<p>The Space-based VHF may increase communication performance and available bandwidth (or channel capacity) required for aircraft, airlines and ATM operations. The space-based VHF will complement existing conventional VHF and will be fully interoperable with existing VHF infrastructures and avionics.</p>								
<p>References</p>	<p>Annex 10 — Aeronautical Telecommunications, Volume III — Communication Systems Annex 10 — Aeronautical Telecommunications, Volume V — Aeronautical Radio Frequency Spectrum Utilization DOC 9776 - Manual on VHF Digital Link (VDL) Mode 2 State letter E3/5-21/37 - ICAO position for ITU WRC-23 CP - Data Communication Infrastructure Specific Working Group (CP-DCIWG)</p>								
<p>Primary Expert Group:</p>	<p>CP - Data Communication Infrastructure Specific Working Group (CP-DCIWG)</p>								
<p>For Information purposes (to be completed by the Secretariat)</p>									
<p>Proposed Metric Note: there could be three sources: 1- Initial Secretariat section 2- Panel ideas IAA</p>	<p>The number of States, that use the space-based aeronautical VHF for Air Ground communications;</p>								
<p>Interdependencies</p>	<p>Results of ITU-R Working Party 5B Studies on WRC-23 Agenda Item 1.7</p>								
<p>Initial Assessment Impact Note: This is only an initial assessment on resources (financial, personnel, etc.). Detailed Impact Assessment is done when SARPs are developed.</p>	<table border="1"> <tr> <td> <p>Impact on States</p> </td> <td> <p>Possible amendment to national regulations, and/or directives to allow the use of the new aeronautical VHF communication technologies</p> </td> </tr> <tr> <td> <p>Impact to Industry</p> </td> <td> <p>The design of new VHF technologies must be fully compatible with existing aircraft VHF avionics and current installations. Possible changes to the communication systems software for air navigation services providers, communication services providers, satellite services providers to support the new aeronautical VHF services Minor changes to the operations manual/procedures for ANSPs and aircraft operators to support the new aeronautical VHF communication system</p> </td> </tr> <tr> <td colspan="2" style="text-align: right;"> <p>Secretariat Project Lead</p> </td> </tr> <tr> <td colspan="2" style="text-align: right;"> <p>Secretary of the CP-DCIWG</p> </td> </tr> </table>	<p>Impact on States</p>	<p>Possible amendment to national regulations, and/or directives to allow the use of the new aeronautical VHF communication technologies</p>	<p>Impact to Industry</p>	<p>The design of new VHF technologies must be fully compatible with existing aircraft VHF avionics and current installations. Possible changes to the communication systems software for air navigation services providers, communication services providers, satellite services providers to support the new aeronautical VHF services Minor changes to the operations manual/procedures for ANSPs and aircraft operators to support the new aeronautical VHF communication system</p>	<p>Secretariat Project Lead</p>		<p>Secretary of the CP-DCIWG</p>	
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Project Team	Secretariat Members	Project Regional Office	Team Focal Points	Secretaries of CP-OPDLWG, ATMOPSP, FLTOPSP and FSMP						
				Document Affected or Actions Needed	Description of Amendment proposal or Action	Supporting Expert Group	Status	Delivery	Expected Effective dates	Applicability
				As assigned by Regional Directors						
		Technical Study		Validate the technical studies developed by States for the space-based VHF	FSMP			Q3 2023		
		Annex 10 - Vol III		Depending on the outcome of the Feasibility/technical studies and Agenda item 1.7 of WRC-23 Review and, as necessary, update SARPs to support medium-term space-based VHF communication systems	ATMOPSP, FLTOPSP, CP-OPDLWG SASP			Q2 2024	July 2026	Q4 2026
		Annex 10 - Vol V		Depending on the outcome of the Feasibility/technical studies and Agenda item 1.7 of WRC-23 Review and, as necessary, update SARPs to support medium-term space-based VHF communication systems	FSMP			Q2 2024	July 2026	Q4 2026
		Manual on Space based VHF communication systems (Doc xxx)		Provide guidance on the space-based VHF communication systems that assist future ICAO activities in support of the implementation	ATMOPSP, FLTOPSP, CP-OPDLWG SASP			Q2 2024		
		Actions		Identify and develop any consequential amendments to any other ICAO Documents	FSMP, ATMOPSP, FLTOPSP, CP-OPDLWG			Q4 2024	July 2026	Q4 2026

