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WORKING PAPER

TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

Agenda Item 1: Strategic issues that address the challenge of integration, interoperability and harmonization of systems in support of the concept of "One Sky" for international civil aviation

1.1: Global Air Navigation Plan (GANP) – framework for global planning

FIXED SATELLITE SERVICE ALLOCATION FOR COMMAND AND CONTROL OF UNMANNED AIRCRAFT SYSTEMS

Presented by the International Coordinating Council of Aerospace Industries Associations)

SUMMARY

This paper presents the aerospace manufacturers' recommendation for an ICAO position on WRC-15 Agenda Item 1.5 to provide for command and non-payload communications links of unmanned aircraft systems to be operated in non-segregated airspace using a fixed satellite service allocation with the technologies to be implemented in the aviation system block upgrade framework.

Action: The Conference is invited to agree on the recommendation presented in paragraph 5.

1. INTRODUCTION

1.1 The purpose of this document is to outline the aerospace manufacturers' International Coordinating Council of Aerospace Industries Associations (ICCAIA) view that studies need to be performed in order to consider the use of fixed satellite service (FSS) allocations to support unmanned aircraft systems[1] (UAS) command and non-payload communications (CNPC) links to ensure a safe and efficient communication infrastructure necessary for the successful implementation of the aviation system block upgrades (ASBUs) and future air transport infrastructure upgrades on regional and global levels.

2. BACKGROUND

2.1 The ICAO Aeronautical Communications Panel (ACP) Working Group F (WG-F) considered use of FSS allocations to support UAS CNPC links at its 27th meeting in September 2012 as well as at its prior

[1] The term unmanned aircraft systems includes remotely piloted aircraft systems (RPAS) as a category.

meeting. The item caused considerable discussion in conjunction with development of the ICAO position for agenda item 1.5[2] of the 2015 World Radiocommunication Conference (WRC-15).

2.2 In its studies leading up to WRC-12, the Radiocommunication Sector of the International Telecommunications Union (ITU-R) determined that 34 MHz and 56 MHz of spectrum would be required for the terrestrial and satellite components of the UAS, respectively. The referenced WRC-15 agenda item provides the basis for studying the feasibility of introducing technical and regulatory provisions in the radio regulations to allow satellites using FSS allocations to be used to provide CNPC links for the operation of UAS in non-segregated airspace.

2.3 In a June 2012 letter to ICAO, ITU-R requested ICAO provide data detailing key properties (e.g. availability) of FSS use for UAS CNPC links to support referenced WRC-15 agenda item studies. With a view to achieving that State WRC positions reflect aviation concerns, ICAO usually develops its WRC Position before ITU-R completes its necessary studies.

3. DISCUSSION

3.1 In the "resolves" of Resolution 153 associated with Agenda Item 1.5, WRC-15 invites ITU-R to undertake studies that could be the basis for initiating regulatory actions to support the use of FSS frequency bands for the UAS CNPC links. These actions would ensure the safe operation of UAS CNPC links pursuant to No. 4.10 of the Radio Regulations, asking Member States to recognize that the safety aspects of radio navigation and other safety services require special measures to ensure their freedom from harmful interference.

3.2 The safety aspects of flight using beyond line-of-sight operation of UAS require very reliable UAS CNPC links through a satellite. Working Party 5B, the lead ITU-R group, intends to estimate to which extent radio links of existing FSS systems could be applicable for the use as the UAS CNPC links in non-segregated airspace. One of the essential parameters ITU-R will use in this study is minimum required availability of forward and return CNPC links between unmanned aircraft control station (UACS) and unmanned aircraft (UA) through a satellite. Equipment manufacturers, after conducting necessary research, agree that a range of availabilities will be required to support operation of various categories of aircraft operating in various classes of airspace and that the higher availability requirements for more demanding situations could be achieved using a combination of de-correlated satellite links.

3.3 Existing commercial FSS systems at Ku and Ka-band offer immediate access to spectrum for UAS. Specifically, various segments of the Ku-band (10.95 – 14.5 GHz) and Ka-band (17.30 – 31.0 GHz) are suitable for UAS control links. This is important as existing satellite systems operating in aeronautical mobile-satellite (route) service (AMS(R)S) spectrum cannot satisfy the identified UAS CNPC satellite component requirements (i.e. 56 MHz).

3.4 Use of FSS allocations would expand the marketplace of UAS communications solutions and build the business case for adoption of UAS and its associated technologies worldwide. Manufacturers would design and build UAS communications components to the specifications that the communications infrastructure will support in the long-term.

3.5 Increasing global air traffic will also impact the availability of spectrum resources. In addition to this, the ASBUs will enable development of many new, data-intensive applications requiring AMS(R)S allocation, which is already in short supply.

[2] The associated Resolution is 153 (WRC-12)

4. CONCLUSION

4.1 In its mission ICAO supports a competitive industry that thrives on continuous innovation to generate efficiencies. Use of FSS allocations could be cost-effective for UAS CNPC links and could provide the necessary level of availability for the safe operation of UAS. This has to be analyzed through adequate technical and regulatory studies of sharing, non-interference and availability by ITU-R under the auspices of ICAO WG-F. Manufacturers support ICAO efforts to satisfy the ITU-R referenced request and ICAO's serious consideration of requirements for regulatory action to enable use of FSS allocations for UAS CNPC links if the necessary technical and regulatory provisions required for such operation are developed consistently with Radio Regulation No. 4.10.

5. ACTION BY THE CONFERENCE

5.1 The Conference is invited to:

a) support current and future requests from the International Telecommunications Union (ITU) WP 5B to provide data concerning WRC-15 Agenda Item 1.5; and

b) consider requirements for regulatory action within ITU-R to enable use of the fixed satellite service (FSS) allocations for unmanned aircraft system (UAS) CNPC links.

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