



Agenda Item 8: Other business

Follow-up to the recommendations of AN/Conf-13 related to MET

(Presented by the Secretariat)

SUMMARY	
This working paper presents the follow-up to the recommendations of the Thirteenth Air Navigation Conference held in Montreal, Canada, on 9-19 October 2018, related to the MET area.	
REFERENCES:	
<ul style="list-style-type: none">• Report of the Thirteenth Air Navigation Conference, Montreal, Canada, 9-19 October 2018.	
ICAO strategic objectives:	<i>A - Safety</i> <i>B - Air navigation capacity and efficiency</i> <i>E - Environmental protection</i>

1. **Introduction**

1.1 The Thirteenth Air Navigation Conference was held in Montreal (Canada) on 9-19 October 2018.

1.2 The Agenda of the Conference included a broad range of topics related to flight safety and air navigation capacity and efficiency of interest to the Directors General of Civil Aviation and to air navigation service providers and all airspace users.

2. **Discussion**

2.1 The Meeting will recall that, according to the agenda of the Thirteenth Air Navigation Conference, MET-related issues were addressed under agenda items 1, 2, and 3 of the Conference.

2.2 Regarding the MET area, the associated recommendations are the following:

- a) Recommendation 1.2/1, item b), related to the ASBU framework and the BBBs;
- b) Recommendation 1.3/1, item a), related to modernisation plans;

- c) Recommendation 1.4/1, item a) and b), related to the cost-benefit study for investment projects;
- d) Recommendation 2.3/1, item a), related to the future provision of aeronautical meteorological services;
- e) Recommendation 2.3/2, item a), related to further development of IWXXM for the exchange of OPMET information;
- f) Recommendation 2.3/3, item a), related to the provision of space weather services;
- g) Recommendation 3.1/1, items a), b), c) and d), related to SWIM implementation;
- h) Recommendation 3.2/1, items a), b) and c), related to support to TBO;
- i) Recommendation 4.2/1, items a) and b), related to the implementation of minimum navigation services; and
- j) Recommendation 4.3/1, items a) and b), related to the development of national air navigation plans.

2.3 Upon reviewing these recommendations, the Meeting should schedule follow-up actions in the States. **Appendix A** to this working paper contains the aforementioned recommendations.

2.4 Based on the above, the Meeting could formulate the following conclusion:

Draft Conclusion SAM/MP/03-XX: Follow-up to the recommendations of AN/Conf-13 related to MET:

That States that have not yet done so:

- a) review and update the ASBU framework and the BBBs related to AIM;
- b) conduct a cost-benefit study for the implementation of MET improvements;
- c) support and prepare roadmaps for SWIM implementation; and
- d) plan the implementation of the basic services defined in the basic building block (BBB) framework in their national air navigation plans.

3. **Suggested action**

3.1 The Meeting is invited to:

- a) take note of the information provided in this working paper;
- b) review the information contained in Appendix A; and
- c) consider formulating the draft conclusion contained in paragraph 2.4.

RECOMMENDATIONS ADOPTED BY THE AN-CONF/13		
Recommendation	Title	Content
1.2/1	GLOBAL TECHNICAL LEVEL OF THE SIXTH EDITION OF THE GLOBAL AIR NAVIGATION PLAN (DOC 9750, GANP)	<p>That States:</p> <ul style="list-style-type: none"> a) agree with the proposed change management process to maintain an up-to-date aviation system block upgrade (ASBU) framework with the formal involvement of the ASBU panel project team (ASBU PPT) to improve transparency, consistency and stability; b) agree, in principle, with the updated ASBU framework and consider the initial version of the basic building block (BBB) framework; <p>That ICAO:</p> <ul style="list-style-type: none"> c) map the global technical level of the <i>Global air navigation plan</i> (Doc 9750, GANP) with the strategic level; d) make available the ASBU and BBB frameworks in an interactive and simplified format, as part of the web-based GANP portal, emphasising the relationship between both frameworks, and between the frameworks and the regional air navigation plan (ANP) elements; e) enable the capability, within the GANP portal, to upload relevant information related to the development and deployment of the ASBU and proposed BBB frameworks in order to allow States, Regions and industry to share information; f) incorporate a flexible framework for emerging air navigation concepts, such as unmanned aircraft systems (UAS), UAS traffic management (UTM), big data, and the aviation internet, into future editions of the GANP; g) include a Global aeronautical distress and safety system (GADSS) thread in the sixth edition of the GANP in line with ICAO provisions; h) design a thread for a global aviation internet network in the GANP, in coordination with aviation and non-aviation-related industries; i) emphasise and enhance a human-centric approach to system design and processes for change management; j) support the conduct of trials for new air navigation concepts as outlined in the ASBU framework within the GANP; and

		<p>k) continue to work with States, international organisations, air traffic management (ATM) modernisation programmes, and other stakeholders on the development of the global technical level of the sixth edition of the GANP for subsequent endorsement at the 40th Session of the ICAO Assembly.</p>
1.3/1	AIR NAVIGATION ROADMAPS	<p>That States:</p> <p>a) provide ICAO with timely information on their modernisation plans and the equipage plans of airspace users;</p> <p>That States and ICAO:</p> <p>b) work collaboratively to adopt a performance-based approach for developing performance requirements and acceptable means of compliance to support the implementation of the <i>Global Air Navigation Plan</i> (Doc 9750, GANP) while considering the need for global interoperability;</p> <p>That ICAO:</p> <p>c) provide air navigation roadmaps, linked to the aviation system block upgrade (ASBU) elements, within the GANP which support:</p> <ol style="list-style-type: none"> 1) new airspace users and emerging technologies; 2) greater flexibility where possible in the choice of technologies, based on performance needs; and 3) earlier adoption of new technologies and operational capabilities as they emerge, linked to the performance needs; <p>d) continue to explore practical means to make use of international standards, in particular through the Standards Roundtable work with recognized standards-making organizations, to expedite the efficient development of ICAO provisions; and</p> <p>e) expedite the work on the Global Data Link Implementation Strategy and develop harmonized solutions to support air-ground data link communications.</p>
1.4/1	COST-BENEFIT ANALYSIS (CBA) IN SUPPORT OF ASSET	<p>That States:</p> <p>a) perform a cost-benefit analysis (CBA) as part of all required impact assessments, in</p>

	<p>DEPLOYMENT</p>	<p>coordination with air navigation services providers (ANSPs) and among other relevant stakeholders, when defining optimum solutions for improvements in the performance of the air navigation system through the use of the aviation system block upgrades (ASBU) framework; and</p> <p>b) use a simplified mechanism, if they do not have a process already in place, such as the checklist available on the Global Air Navigation Plan (GANP) Portal, for CBA of air navigation infrastructure investment projects to support improvements as described in the ASBU framework;</p> <p>That ICAO:</p> <p>c) support the implementation of applicable CBA methodologies through dedicated workshops.</p>
<p>2.3/1</p>	<p>FUTURE PROVISION OF AERONAUTICAL METEOROLOGICAL SERVICE</p>	<p>That States:</p> <p>a) and international user organizations ensure that adequate expert capacity is applied in the collaborative management and development of aeronautical meteorological services for international air navigation;</p> <p>That ICAO:</p> <p>b) ensure it has sufficient capacity and expertise to progress the work on the development of provisions related to aeronautical meteorology, including the foreseen impact on international air navigation due to climate change, to be described in the Sixth Edition of the <i>Global Air Navigation Plan</i> (Doc 9750, GANP); and</p> <p>c) develop implementation assistance, including guidance material, for space weather information service, the provision of globally-consistent, phenomena-based hazardous meteorological information, the meteorological component of system-wide information management (SWIM), cost-recovery solutions for regional and global systems, and potential new initiatives to address issues such as the impact of climate change on aviation, including provision of meteorological services to the air traffic management (ATM) community in the context of increased tropical convective systems.</p>
<p>2.3/2</p>	<p>FURTHER DEVELOPMENT OF IWXXM FOR THE EXCHANGE OF AERONAUTICAL</p>	<p>That States:</p> <p>a) provide ICAO with their ICAO meteorological information exchange model (IWXXM) implementation plans before 2020;</p>

	<p>METEOROLOGICAL INFORMATION</p>	<p>That ICAO:</p> <ul style="list-style-type: none"> b) promote the importance of exchanging meteorological information for aeronautical purposes in compliance with the IWXXM; c) in close coordination with the World Meteorological Organization (WMO): <ul style="list-style-type: none"> 1) ensure that the IWXXM format is the only standard exchange format by 2026; 2) develop the policies and procedures necessary to ensure a smooth transition from traditional alpha numeric code (TAC) format to IWXXM format for the purpose of data exchange to support international air navigation, as an interim step toward full IWXXM implementation; 3) promote awareness of the changes brought about by the IWXXM data format, production, dissemination and data exchange among operators; and 4) monitor the status of implementation of IWXXM at State and regional levels.
<p>2.3/3</p>	<p>PROVISION OF SPACE WEATHER INFORMATION SERVICE MEETING THE OPERATIONAL NEEDS OF USERS</p>	<p>That States:</p> <ul style="list-style-type: none"> a) encourage the research of operational impacts of space weather phenomena on civil aviation using performance-based approaches and establish requirements for the use of space weather information for civil aviation; <p>That ICAO:</p> <ul style="list-style-type: none"> b) continue to facilitate coordination between the space weather information service providers and aeronautical users to clarify the needs and solutions for improved safety and efficiency of civil aviation through the provision of space weather information and training on the use of the information; and c) coordinate with other international organisations, such as the International Telecommunication Union – Radio communication sector (ITU-R) and the World Meteorological Organization (WMO), to facilitate research of operational impacts of space weather phenomena on civil aviation using performance-based approaches and develop requirements and/or guidance for the use of space weather information for civil aviation.
<p>2.3/4</p>	<p>DEVELOPMENT OF COST-RECOVERY MECHANISMS FOR THE PROVISION OF</p>	<p>That ICAO:</p> <ul style="list-style-type: none"> a) support the need to expeditiously identify how aeronautical meteorological service provision has changed, how it will continue to evolve, and how these changes

	<p>AERONAUTICAL METEOROLOGICAL INFORMATION</p>	<p>(including those arising from the impact of climate change on aviation) may affect the recovery of relevant costs associated with service provision on a global, multi-regional, regional, and sub-regional basis; and</p> <p>b) in close coordination with the World Meteorological Organization (WMO):</p> <ol style="list-style-type: none"> 1) review deficiencies in the current cost-recovery systems; 2) identify new cost-recovery challenges that have arisen (taking into consideration the issues described in a) above); and 3) identify possible mechanisms to recover these costs in a manner consistent with <i>ICAO’s Policies on Charges for Airports and Air Navigation Services</i> (Doc 9082).
<p>3.1/1</p>	<p>SYSTEM-WIDE INFORMATION MANAGEMENT (SWIM)</p>	<p>That States:</p> <ol style="list-style-type: none"> a) support developments and implementation of system-wide information management; b) via the mechanism of the planning and implementation regional groups (PIRGs), showcase regional system-wide information management (SWIM) demonstrations, highlighting the operational and economic benefits of SWIM, and evaluate possible transition and mixed-mode scenarios; c) share information, lessons learned and observations regarding SWIM development and implementation; d) develop national implementation plans in alignment with regional strategies and priorities and in accordance with the strategy outlined in the <i>Global Air Navigation Plan</i> (Doc 9750, GANP) which would include SWIM; <p>That ICAO:</p> <ol style="list-style-type: none"> e) while making use of already developed Standards and best practices, continue the development of provisions related to information services, while including relevant guidance, governance aspects, information content and related information exchange models, and supporting technical infrastructure and governance for SWIM in sufficient detail to ensure safe, efficient and secure globally seamless operations; f) consider the concept of a global SWIM framework as part of the GANP and the aviation system block upgrades (ASBUs);

		<ul style="list-style-type: none"> g) consider security-by-design principles when developing interconnected trusted global SWIM frameworks; h) develop provisions related to the harmonization of information exchange models and globally interconnected registries; i) through regional events, and in collaboration with States and industry, promote SWIM and its benefits, as described in the <i>Manual on System-wide Information Management</i> (Doc 10039), as well as implementation best practices to the aviation community; and j) provide assistance to States to support the implementation of Annex 15 – <i>Aeronautical Information Services and Procedures for Air Navigation Services – Aeronautical Information Management</i> (Doc 10066, PANS-AIM).
3.2/1	TRAJECTORY-BASED OPERATIONS (TBO)	<p>That States, along with stakeholders:</p> <ul style="list-style-type: none"> a) continue to provide ICAO with the developments and lessons learned from air traffic management (ATM) modernisation programmes; b) work through ICAO to identify and address, not only potential issues, but also opportunities such as the improved management of global traffic flows through a global network-centric approach to ensure the successful development and implementation of trajectory-based operations (TBO); c) through the mechanism of the planning and implementation regional groups (PIRGs), integrate current implementation efforts with regional transition plans for flight and flow information for a collaborative environment (FF-ICE), system-wide information management (SWIM) and TBO; <p>That ICAO:</p> <ul style="list-style-type: none"> d) finalise the global TBO concept and its elements in the sixth edition of the <i>Global Air Navigation Plan</i> (Doc 9750, GANP) and the aviation system block upgrade (ASBU) framework; and e) develop guidance on transitioning to a globally interoperable TBO environment in the context of on-going ATM initiatives while addressing all domains of ATM systems and taking into consideration existing and new types of airspace users.
3.3/1	NETWORK OPERATIONS (NOPS)	That States:

		<ul style="list-style-type: none"> a) implement collaborative decision-making (CDM) processes in support of effective airspace management in the provision of air navigation services, including cross-border operations and resource management; b) plan and implement, according to their operational needs, operational improvements related to network operations in a coordinated manner within and across regions; <p>That ICAO:</p> <ul style="list-style-type: none"> c) develop further provisions and guidance material on air traffic flow management (ATFM), supporting a global collaborative network management in support of trajectory-based operations (TBO); and d) support, through its Regional Offices, the sharing of best practices and the advancement of technical cooperation agreements between States in order to implement ATFM.
<p>4.2/1</p>	<p>IMPLEMENTATION OF MINIMUM AIR NAVIGATION SERVICES</p>	<p>That States:</p> <ul style="list-style-type: none"> a) consider the use of more advanced technologies and procedures, in coordination with international organizations and industry stakeholders, to provide the minimum air navigation services for international civil aviation, taking into account the principles of global interoperability and performance specification compliance; b) include planning for the implementation of the basic services outlined in the basic building blocks (BBB) framework within their national air navigation plans. <p>That ICAO:</p> <ul style="list-style-type: none"> c) in coordination with the planning and implementation regional groups (PIRGs) and by making use of existing reporting mechanisms, verify the provision of the minimum air navigation services for international civil aviation, as outlined in the BBB framework, through the methodology for the identification of air navigation deficiencies against the regional air navigation plans; d) develop the necessary tools to support the PIRGs in the verification of the provision of the basic building block (BBB) services at the regional and national levels; e) coordinate the interoperability of systems and harmonization of procedures at a regional level, through the PIRGs, in relation to the use of advanced technologies and concepts of operations, taking into account global requirements; f) in line with the No Country Left Behind (NCLB) initiative, provide the necessary technical

		<p>assistance to States for the provision of basic air navigation services as identified by the PIRGs and as reflected in State national air navigation plans; and</p> <p>g) urge the aviation manufacturing industry to create a testing environment for States to justify procurement decisions which guaranty interoperability and system functionality within local specific environments, as a follow-up to the provision of basic air navigation services.</p>
<p>4.3/1</p>	<p>IMPROVING THE PERFORMANCE OF THE AIR NAVIGATION SYSTEM</p>	<p>That States:</p> <ul style="list-style-type: none"> a) adopt and adapt as needed, the six-step performance management process for the planning and implementation of air navigation improvements and reflect this process in their national air navigation plans; b) align their national air navigation plans with regional plans to attain a globally harmonized performance management process and support the achievement of global performance objectives; c) support ICAO in promoting the No Country Left Behind (NCLB) initiative and reaffirm their commitment to the development of timely and accurate national air navigation plans aligned with regional and global plans; <p>That ICAO:</p> <ul style="list-style-type: none"> d) encourage the planning and implementation regional groups (PIRGs) to embrace a performance-based approach for implementation and adopt the six-step performance management process, as described in the <i>Manual on Global Performance of the Air Navigation System</i> (Doc 9883), by reflecting the process in Volume III of all regional air navigation plans; e) continue to expedite the work on performance indicators related to the <i>Global Air Navigation Plan</i> (Doc 9750, GANP), including review of the work by an appropriate group of performance experts and consider establishing such an expert group under the Global Air Navigation Plan (GANP) Study Group; and f) examine possible operational incentives in the development of new air traffic management (ATM) concepts.