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Agenda Item 4: Provision of AOP in the Asia/Pacific Region

- Planning & Design of Aerodromes

ADDRESSING GAPS BETWEEN ICAO ANNEX 14 VOLUME I AND STOLPORT MANUAL (DOC 9150)

(Presented by Malaysia)

SUMMARY

This paper highlights the lack of clarity and inconsistency found in the definition and design requirements of STOLports as outlined in ICAO Annex 14, Volume I – Aerodrome Design and Operations and Doc 9150 – STOLport Manual. While Doc 9150 provides useful guidance, it does not constitute formal Standards and Recommended Practices (SARPs) leading to potential ambiguities in interpretation and regulatory compliance. Furthermore, key discrepancies exist between the two documents and their applicability to STOLports. Consequently, these inconsistencies may pose challenges during the planning, certification, design and oversight of STOLports which needs to be clarified.

1. INTRODUCTION

1.1 STOLports (Short Take-Off and Landing Airports) serves as critical role in enhancing regional air connectivity particularly in areas where conventional airports are not feasible. In Malaysia, STOLports play an important role in connecting remote and rural areas where roads or other transport options are limited. By accommodating aircraft capable of operating on shorter runways, they help boost local economies through agriculture, tourism and small businesses in supporting sustainable regional development.

1.2 In accordance with ICAO Doc 9150 – Stolport Manual, a stolport is an airport whose physical characteristics, visual and non-visual aids and total infrastructure are created to support safe and effective public air transport in and out of densely populated urban areas as well as to and from rural areas with difficult terrain.

1.3 The ICAO Annex 14, Volume I – Aerodrome Design and Operations establishes the international Standards and Recommended Practices (SARPs) for the design and operation of aerodromes in ensuring uniformity and safety across global aviation infrastructure. However, the specifications contained in the Annex 14, Volume I are not applicable to STOLports.

1.4 To supplement this gap, ICAO Doc 9150 – STOLport Manual was developed as a technical reference providing practical guidance on the planning, design and implementation of STOLports. Unlike Annex 14, however, Doc 9150 does not carry the status of SARPs and is therefore not binding.

2. DISCUSSION

Definition of STOLport

2.1 Although ICAO Doc 9150 introduces the concept of STOLports, it does not offer a formal definition within the context of ICAO Annex 14, Volume I. Presently, there is no explicit definition of a STOLport in either Annex 14 or Doc 9150.

2.2 In the Malaysian context, STOLports are typically classified as non-international aerodromes of code number 1 or 2, operating under day Visual Meteorological Conditions (VMC) and supporting non-instrument runways.

Ambiguity in STOLport Categorization

2.3 Para 1.1.3 of Doc 9150 states that “for the purpose of this manual, the STOLport design aeroplane is assumed to be an aeroplane that has a reference field length of 800 m or less. In size, the STOLport design aeroplane is assumed to have a wingspan of up to 26 m and a main landing gear measurement of up to 9 m”.

2.4 When cross-referenced with Table 1-1 of Annex 14, Volume I, this design profile aligns with:

- Code Number 1 (Reference field length < 800 m), and
- Code Letters A (Wingspan < 15 m) or B (Wingspan between 15 m to < 24 m)

However, ambiguity arises regarding whether STOLports may also fall under:

- Code Number 2 (Reference field length 800 m to < 1200 m), or
- Code Letter C (Wingspan 24 m to < 36m), which introduces uncertainty for aircraft at the upper end of STOLport design assumptions.

Table 1-1. Aerodrome reference code

Code element 1	
Code number	Aeroplane reference field length
1	Less than 800 m
2	800 m up to but not including 1 200 m
3	1 200 m up to but not including 1 800 m
4	1 800 m and over
Code element 2	
Code letter	Wingspan
A	Up to but not including 15 m
B	15 m up to but not including 24 m
C	24 m up to but not including 36 m
D	36 m up to but not including 52 m
E	52 m up to but not including 65 m
F	65 m up to but not including 80 m

2.5 This ambiguity complicates the determination of the appropriate aerodrome reference code during the design or certification of STOLports, particularly in cases involving newer STOL-capable aircraft that may slightly exceed traditional design assumptions.

2.6 The absence of clear thresholds or guidance for such cases may lead to inconsistent application of design standards and regulatory interpretations.

Inconsistencies Between Design Specifications in Annex 14 and Doc 9150

2.7 Notable differences exist between the design specifications outlined in ICAO Annex 14, Volume I, and the guidance contained in Doc 9150. These inconsistencies generate ambiguity in determining the appropriate standards to be applied for STOLport development and certification. Key examples of the inconsistencies between design specifications in both documents are as follows:

No.	Item	Annex 14 Volume I	Doc 9150
1	Width of Runway Strips	<u>Code 1 or 2, non-precision approach runway</u> At least 70 m on each side of the centre line of the runway (Reference: Clause 3.4.4) <u>Code 2, non-instrument runway</u> At least 40 m on each side of the centre line of the runway <u>Code 1, non-instrument runway</u> At least 30 m on each side of the centre line of the runway (Reference: Clause 3.4.5)	<u>For operations at night or in instrument meteorological conditions</u> 75 m on either side of the centre line <u>Day-time operations in visual meteorological conditions</u> At least 45 m on either side of the centre line (Reference: Para 3.3.2.1)
2	Length of Runway Strips	<u>Code 1, non-instrument</u> At least 30 m before the threshold and beyond the end of the runway or stopway <u>Code 2 or Code 1 instrument</u> At least 60 m before the threshold and beyond the end of the runway or stopway (Reference: Clause 3.4.2)	60 m beyond each runway end or stopway (Reference: Para 3.3.2.2)

2.8 These discrepancies raise fundamental questions the intended design and operational expectations for STOLports. In the absence of clearly harmonized standards and guidance, regulatory authorities may face challenges in determining the minimum safety requirements to be applied during certification, oversight activities or compliance assessment. This lack of clarity may lead to variable interpretations and potential safety margins that are either overly conservative or insufficient.

Applicability of Annex 14, Volume I and Doc 9150

2.9 Clause 1.2.2 in Annex 14 Volume I states that “The specifications, unless otherwise indicated in a particular context, shall apply to all aerodromes open to public use in accordance with the requirements of Article 15 of the Convention. The specifications of Annex 14, Volume I, Chapter 3, shall apply only to land aerodromes. **The specifications in this volume shall apply, where appropriate, to heliports but shall not apply to STOLports**”.

2.10 Annex 14 Volume I further note that, although there are at present no specifications relating to STOLports, it is intended that specifications for these aerodromes will be included as they are developed. In the interim, guidance material on STOLports is given in the STOLport Manual (Doc 9150).

2.11 Para 1.2.1 of Doc 9150 states that “The guidance material provided in this manual is meant for the use of STOLport planners and the appropriate airport certifying authorities in examining the feasibility of STOLport operations at existing aerodromes or other sites and in the planning, design and approval of STOLports”.

2.12 Para 1.2.2 of Doc 9150 further clarifies that “**Although the specifications of Annex 14, Volume I, Aerodrome Design and Operations do not apply to STOLports**, much of the guidance material in this manual conforms to the International Standards and Recommended Practices set forth in that Annex”.

2.13 This dual structure of formal standards in Annex 14 and non-binding guidance in Doc 9150 creates a regulatory grey area for planners, designers, and certifying bodies.

Regulatory and Operational Implications

2.14 **Lack of Clarity and Consistency:** The absence of a formal STOLport definition and standardized design parameters can lead to inconsistent interpretations among States, regulators, and aerodrome operators.

2.15 **Certification Challenges:** Discrepancies between Annex 14 SARPs and Doc 9150 guidance may complicate the certification process. Infrastructure compliant with Doc 9150 may be deemed insufficient when assessed under Annex 14 standards.

2.16 **Operational Limitations:** Ambiguity in the classification of aircraft and aerodrome codes may hinder the development of infrastructure that can accommodate evolving STOL-capable aircraft, particularly those with characteristics approaching the thresholds of Code 2/C.

2.17 **Safety Oversight Concerns:** Regulatory authorities may issue findings of non-conformance during audits or surveillance activities due to differing interpretations of applicable standards, necessitating corrective actions and delaying project approvals.

3. RECOMMENDATIONS & CONCLUSION

3.1 As Doc 9150 is a guidance manual and not an ICAO Annex, its provisions do not constitute binding SARPs. As such, its provisions are advisory in nature and subject to varying interpretations by States.

3.2 Likewise, the design requirements for Code 1 and Code 2 aerodromes are already included within Annex 14, Volume I. However, the absence of a clear definition for STOLports and dedicated SARPs for STOLports coupled with the interpretative nature of Doc 9150 creates ambiguity in regulatory application and oversight practices.

3.3 In this context, it is recommended that ICAO to consider the development and incorporation of formal SARPs specific to STOLports under Annex 14. Alternatively, ICAO may provide further clarification regarding the applicability of Annex 14, Volume I to STOLport operations, including its use in conjunction with Doc 9150 to support consistent interpretation and implementation across States.

3.4 Lastly, the establishment of clear and harmonized SARPs and the provision of well-defined interpretative guidance would enhance regulatory clarity and consistency. In turn, this would facilitate a more uniform application in designing and certification standards for STOLports particularly in developing States facing challenges and requiring clearer regulatory direction and oversight frameworks.

4. ACTION BY THE MEETING

4.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) recommend that ICAO consider to develop dedicated SARPs for STOLports under Annex 14 or provide clearer guidance on how Annex 14 and Doc 9150 should be applied together; and
- c) discuss any relevant matters as appropriate.

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