



Working Arrangement
between
The European Aviation Safety Agency
(EASA)
and
The Civil Aviation Authority of Singapore
(CAAS)
on
Cooperation in the Domain of Wake
Turbulence Separation and Aircraft
Categorisation Standards

The European Aviation Safety Agency (EASA) and the Civil Aviation Authority of Singapore ("CAAS"), hereinafter referred to as "the Parties" and individually as a "Party",

Desiring to promote a high level of civil aviation safety;

Noting that the demand for airport capacity increases every year and that one of the main constraints in this regard relates to runway capacity which is directly linked to the minimum aircraft separations, including wake turbulence separations, between aircraft on arrival or departure;

Recalling that the standards on aircraft separation are prescribed by ICAO *Procedures for Air Navigation Services — Air Traffic Management* (ICAO PANS-ATM, Doc 4444), including aircraft wake turbulence categories and separation minima;

Determined to cooperate so as to contribute to further development and enhancement of aviation safety standards;

Noting the RECAT-EU initiative, a Pan-European wake turbulence categorisation scheme which has been proposed by EASA and European partners for implementation on a voluntary basis and which is built upon the ICAO PANS-ATM (Doc 4444)¹ as well as the extensive knowledge on wake turbulence in operational environment developed through a series of research projects and measurement campaigns;

Underlining that the implementation of the RECAT-EU wake turbulence separation scheme in Singapore is preconditioned by the conduct of a local safety assessment by CAAS covering, *inter alia*, the changes to the air traffic management (ATM) functional system and approval given by CAAS;

Have agreed to conclude this Working Arrangement as follows:

1. PURPOSE AND SCOPE

1.1 This Working Arrangement:

- a) establishes a framework for cooperation between the Parties in the domain of wake turbulence separation and aircraft categorisation standards; and
- b) sets out the terms of the organisation and conduct of a wake turbulence measurement campaign and the related safety assessment in Singapore (hereinafter referred to jointly as "the Project").

1.2 Through this Working Arrangement, for the purpose of organising and conducting the wake turbulence measurement campaign and the safety assessment, EASA will assist CAAS to prepare and implement the RECAT-EU wake turbulence separation scheme at Singapore Changi Airport (WSSS) for approach and departure movements, based on the safety assessment to be undertaken, the risk assessment framework already developed for the RECAT-EU² and the air traffic control (ATC) working procedures and methods *in situ*.

¹ International Civil Aviation Organization (ICAO), *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM), Doc 4444, Edition 15, 2007.

² RECAT-EU Safety Case report, Edition 1.3, issued by EUROCONTROL and confirmed by EASA to provide the assurance that the RECAT-EU wake turbulence separation scheme can be used by EU Member States as a basis to update current schemes. The safety assessment for the RECAT-EU minima reviewed by EASA has been performed using an extensive set of wake turbulence data, as well as operational data from several large EU airports.

- 1.3 The Parties agree that, subject to mutual interest, their cooperation within the scope of this Working Arrangement may be further developed to address other related areas or specific projects, in which case this Working Arrangement shall be amended accordingly.

2. DEFINITIONS

For the purposes of this Working Arrangement, the following definitions shall apply:

"data" means any measurement or the result of a measurement or any analysis, calculation, information, procedure or document developed, obtained or used in the course of the Project.

"foreground intellectual property" means intellectual property, including patents, copyright and industrial design, which results from or is generated in the course of the Project.

"staff members of EASA" means staff members of EASA and any other hired persons of EASA.

"RECAT-EU" means the Pan-European Initiative for the revision of Wake Turbulence Categorisation Scheme and Separation Minima on Approach and Departure.

"wake turbulence" means the air vortices naturally generated at the wing tips of an aeroplane in flight, or from the rotor blades of a helicopter in forward flight.

3. OBJECTIVES AND PRINCIPLES

- 3.1 The Parties agree on the following objectives of the Project:
- a) the development of a Local Safety Case for WSSS, on the basis of wake turbulence measurements conducted, analysed and disseminated in accordance with a Project Plan;
 - b) the review of relevant ATC procedures at WSSS and the organisation of the appropriate ATCO training;
 - c) the development, publication and communication of the new separation minima at WSSS and the establishment of a continuous safety monitoring system.
- 3.2 The Parties agree that in no event shall they consider each other liable for any damages arising either out of the implementation of this Working Arrangement or the implementation of the Project.
- 3.3 The Parties agree to render each other mutual assistance, as far as reasonable, in case of any and all claims, demands, liability, losses, suits in law or in equity which are made by any third party in relation to the subject-matter of this Working Arrangement.

4. ORGANISATION AND COORDINATION

- 4.1 The Parties will establish and manage a joint Project Team co-chaired by EASA and CAAS. The Parties will agree on the need to involve third parties in the Project.
- 4.2 CAAS will take such necessary steps, in coordination with EASA, to ensure proper formalisation of the involvement of the third parties referred to in paragraph 4.1, as

well as the acquisition of equipment, access to sites, systems or facilities or any other support or arrangement *in situ* reasonably deemed relevant for the purpose of the Project.

- 4.3 The Project Team will establish the Project Plan defining a roadmap, type of data to be collected, the extent of measurements and the equipment to be used for the purpose of the Project, as well as any other operational or procedural aspects deemed relevant by either Party.
- 4.4 The Project Team will coordinate measurements, collect, review and analyse data and, on the basis thereof, develop the Local Safety Case. The Project Team will review ATC working procedures at WSSS and methods for aircraft separation assurance and propose any amendments to CAAS' separation standards, issue recommendations in respect of the CAAS Air Traffic Services Division's Safety Management System (SMS) and advise CAAS on the required changes to the Aeronautical Information Publication (AIP).
- 4.5 The Parties will meet as necessary to ensure consistent application of this Working Arrangement. The purposes of these meetings will be to discuss any disagreement regarding the interpretation or application of this Working Arrangement, including any technical issues related to the Project that cannot be solved at the Project Team level, and consider and propose amendments to the Working Arrangement, if necessary. The frequency of these meetings will be mutually agreed by the Parties and will depend on the number and significance of the issues to be discussed.

5. COSTS

- 5.1 The Parties agree to bear their respective costs incurred from the application of this Working Arrangement, including travel and accommodation costs and expenses incurred by the Project Team members arising out of travel to or from Singapore.
- 5.2 The Parties agree that any cost arising out of the involvement of third parties referred to in paragraph 4.1, including travel and accommodation costs and expenses arising out of travel to or from Singapore, or the acquisition or use of any equipment, system or facility incurred for the purpose of the Project will be borne by CAAS.

6. COMMUNICATION

- 6.1 A Focal Point will be assigned by each Party to facilitate the implementation of this Working Arrangement. All routine communication will take place between these Focal Points. The List of Focal Points is contained in Annex 1 to this Working Arrangement and may be modified by the Parties in accordance with paragraph 9.2.
- 6.2 All communication between the Parties related to the implementation of this Working Arrangement will be conducted in the English language.

7. INTELLECTUAL PROPERTY RIGHTS (IPR)

- 7.1 The Parties recognise the importance of a clear ownership status of IPR and effective IPR management. For that purpose, the Parties shall establish a list of all existing copyright and Intellectual Property Rights held by creators obtained prior to the entry into force of this Working Arrangement.

- 7.2 The Parties agree that CAAS shall own all copyright and all other IPR of whatsoever nature over all foreground intellectual property (including without limitation data, documents, workflows, the Project Plan and the Local Safety Case) produced in the course of the Project.
- 7.3 The Parties further agree that all copyright and IPR other than those referred to in paragraph 7.2 shall remain the property of their respective owners.
- 7.4 The Parties agree that EASA is authorised by CAAS under this Working Arrangement to retain and use the data referred to in paragraph 7.2 without any restrictions or limitations and at no fee or a charge. The Parties further agree that EASA shall not copy, release, or show the data referred to in paragraph 7.2 to anyone other than staff members of EASA without prior written consent of CAAS.

8. CONFIDENTIALITY

- 8.1 The Parties agree that, subject to EU and Singapore law, the data produced, used or obtained in the course of the Project is confidential and will use reasonable efforts to put in place a reasonable level of protection.
- 8.2 The Parties will in particular ensure that all third parties involved in the Project are informed about the confidential nature of the data and that they are legally bound by confidentiality obligations before being granted access to it.
- 8.3 The Parties will consult each other should any concern on confidentiality arise and the disclosing Party shall seek prior written consent of the other Party in case requests from persons or organisations not involved in the Project to access data are received.

9. ENTRY INTO FORCE, SETTLEMENT OF DISPUTES, AMENDMENT AND TERMINATION

- 9.1 This Working Arrangement will enter into force at the date of signature by each Party's authorised representative. When the signature process is performed by exchange of letters, this Working Arrangement shall enter into force at the date of notification of the last signature of the Parties' duly authorised representatives.
- 9.2 This Working Arrangement may be amended in writing by mutual consent of the Parties.
- 9.3 Any disagreement regarding the interpretation or application of this Working Arrangement shall be resolved by common accord between the Parties.
- 9.4 This Working Arrangement will continue to apply until terminated by either Party by written notice. Such termination will be effected upon the sixty calendar day's period following the date of receipt of the written notification, unless the notice of termination has been withdrawn by mutual agreement before the expiry of the aforesaid period. Notwithstanding the aforesaid notice and termination, the Parties shall take into account all activities or arrangements ongoing under this Working Arrangement at the time of the giving of the notice and shall reasonably endeavour to satisfactorily

wind down such activities or arrangements with the least possible disruption to each Party.

Signed in duplicate in the English language in Singapore on 19 August 2015.

For the European Aviation Safety Agency
(EASA)
by



MR PATRICK KY
EXECUTIVE DIRECTOR

For the Civil Aviation Authority of Singapore
(CAAS)
by



MR KEVIN SHUM JUN-CHYI
DIRECTOR-GENERAL OF CIVIL AVIATION

Annex 1
List of Focal Points

FOR EASA	FOR CAAS
Certification Directorate Postfach 10 12 53 D-50452 Cologne Germany Chief Expert – OSD Capt Andrea Boiardi Phone: +49 221 89990 4361 Fax: +49 221 89990 9535 Email: andrea.boiardi@easa.europa.eu	Aerodrome and ANS Regulation Division Civil Aviation Authority of Singapore Singapore Changi Airport, P O Box 1 Singapore 918141 Head (Air Traffic Services Safety Oversight) Lim Lam Seng Phone: +65 6541 3035 Fax: +65 6542 3869 Email: lim_lam_seng@caas.gov.sg

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