European Aviation Safety Agency

NOTICE OF PROPOSED AMENDMENT

NPA 2012-06

RMT.0416 (OPS.009(a)) and RMT.0417 (OPS.009(b))

Sterile Flight Deck Procedures

EXECUTIVE SUMMARY

During movement of the aircraft, the flight crew, whenever necessary, must be able to focus on their duties without being disturbed by non-flight related matters. This holds especially for safety-critical phases of the flight. Following this approach, Implementing Rules and associated Acceptable Means of Compliance (AMC) and Guidance Material (GM) for air operations are in force or will be in force in the foreseeable future (when the Agency's Opinions 04/2011, 01/2012 and 02/2012 have been adopted by the Commission). However, even then the following elements will not be included in the regulatory framework:

1. The concept of a sterile flight deck;
2. The taxi phase of aeroplanes as a safety-critical activity; and
3. Procedures for taxiing to enhance runway safety.

The Agency established rulemaking tasks RMT.0416 (Implementing Rules) and RMT.0417 (AMC and GM) on 'sterile flight deck procedures' to consider the elements listed above. These rulemaking tasks are based on a rulemaking proposal of the Joint Aviation Authority (JAA) 'Operations Procedures Steering Group (OPSG)' from 2007.

The present rulemaking tasks are focused on air operations. With the present Notice of Proposed Amendment (NPA), the Agency proposes Implementing Rules, AMC and GM to be considered by the operator when establishing procedures relevant to flight, cabin and technical crew. One major aim is to enhance runway safety through the introduction of operational procedures and best practices for the taxi phase including sterile flight deck procedures. In this context taxiing of aeroplanes should be treated as a safety-critical activity, but is not defined as a critical phase of flight. The concept of sterile flight deck, however, is not limited to the taxi phase. It rather has to be applied during all critical phases of flight and should also be applied for flight below 10 000 feet above the aerodrome of departure or the aerodrome of destination, except for cruise flight.

TABLE OF CONTENTS

A. Explanatory Note

I. Introduction

1. Over the years it has been identified that an accident or an incident may occur when the flight crew divert their attention from the task at hand and becomes occupied with activities not directly related to the current phase of flight. Such activities are extraneous conversations, cabin crew calls on non-essential matters, non-pertinent radio calls, public address announcements, etc. Clearly, the chance of error increases when the flight crew are disturbed from their main responsibilities. Consequences that could result from such a disturbance include altitude deviations, course deviations, runway transgressions and take-offs or landings without clearance.

2. In light of the safety risk, the flight crew must be able to focus on their duties without being disturbed by non-flight related matters, whenever necessary during movement of the aircraft. This holds especially for safety-critical phases of the flight. Implementing Rules and associated Acceptable Means of Compliance (AMC) and Guidance Material (GM) for air operations are in force or will be in force in the foreseeable future (when the Agency's Opinions 04/2011[1], 01/2012[2] and 02/2012[3] have been adopted by the Commission). However, even then the following elements will not be included in the regulatory framework:

   a. The concept of a **sterile flight deck**;

   b. The taxi phase of aeroplanes as a **safety-critical activity**; and

   c. **Procedures for taxiing** to enhance runway safety.

   The need for considering these elements will be explained in detail below. The Agency summarised the present rulemaking tasks under the header 'Sterile flight deck procedures'. These tasks are focused on air operations. One major aim is to enhance runway safety through the introduction of operational procedures and best practices for the taxi phase including sterile flight deck procedures. Implementing Rules, AMC and GM are proposed to provide elements to be considered by the operator when establishing its procedures as relevant to flight, cabin and technical crew for the following phases of flight:

   - All critical phases of flight (for helicopters this includes taxiing (see below));
   - For aeroplanes during taxiing; and
   - Below 10 000 feet above the aerodrome of departure or the aerodrome of destination, except for cruise flight.

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1 Opinion No 04/2011 of the European Aviation Safety Agency of 1 June 2011 for a Commission Regulation establishing the Implementing Rules for air operations 'Air Operations – OPS'. This Opinion contains DEF (definitions), Part-ORO (organisation requirements) and Part-CAT (commercial air transport) relevant for the present rulemaking activity. Available under http://www.easa.europa.eu/agency-measures/opinions.php.

2 Opinion No 01/2012 of the European Aviation Safety Agency of 1 February 2012 for a Commission Regulation establishing the Implementing Rules for air operations 'Air Operations – OPS (Part-NCC and Part-NCO)'. This Opinion contains Part-NCC (non-commercial operations of complex motor-powered aircraft) and Part-NCO (non-commercial operations of other-than-complex motor-powered aircraft) relevant for the present rulemaking activity. Available under http://www.easa.europa.eu/agency-measures/opinions.php.

3 Opinion No 02/2012 of the European Aviation Safety Agency of 16 April 2012 for a Commission Regulation establishing the Implementing Rules for air operations 'Air Operations – OPS (Part-SPO)'. This Opinion contains Part-SPO (specialised operations) relevant for the present rulemaking activity. Available under http://www.easa.europa.eu/agency-measures/opinions.php.

II. Process and scope

3. On the grounds of the Basic Regulation[4], the European Aviation Safety Agency (hereafter referred to as the 'Agency') developed this Notice of Proposed Amendment (NPA)[5] in line with the Rulemaking Procedure[6].

4. This rulemaking activity is included in the Agency's Rulemaking Programme for 2012-2015 in line with the Rulemaking Procedure. It implements the following rulemaking tasks:

   - RMT.0416 (OPS.009(a)) 'Sterile flight deck procedures – Implementing Rules'; and
   - RMT.0417 (OPS.009(b)) 'Sterile flight deck procedures – AMC and GM'.

   The scope of this rulemaking activity is defined in the Terms of Reference (ToR) RMT.0416 (OPS.009(a)) and RMT.0417 (OPS.009(b)) as published on the Agency's website[7].

5. The text of this NPA has been developed by the Agency, considering the input of the corresponding Rulemaking Group. It is submitted for consultation of all interested parties in accordance with Article 52 of the Basic Regulation and Articles 5(3) and 6 of the Rulemaking Procedure.

III. Overview of the changes proposed in this NPA

General background

6. The present rulemaking tasks were proposed in 2007 by the Joint Aviation Authority (JAA) 'Operations Procedures Steering Group' (OPSG). This group was led by the industry. The OPSG requested the Agency to initiate a rulemaking task with the title 'taxi procedures, runway incursion prevention and sterile cockpit'. When submitting this rulemaking proposal, the OPSG provided draft text to be implemented in the regulatory framework which was effective at that time. The proposed text contained the following elements:

   a. Implementing Rule for taxiing;

   b. Advisory Circular Joint (ACJ) with detailed procedures for taxiing;

   c. Implementing Rule for establishing sterile flight deck procedures; and

   d. Appendix to the Implementing Rule containing sterile flight deck procedures.

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[4] Regulation (EC) No 216/2008 of the European Parliament and the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1), as last amended by Regulation (EC) No 1108/2009 (OJ L 309, 24.11.2009, p. 51).

[5] The Agency is directly involved in the rule-shaping process. It assists the Commission in its executive tasks by preparing draft Regulations for the implementation of the Basic Regulation and amendments thereof, which are adopted as 'Opinions' (Article 19(1)). It also adopts Certification Specifications, Acceptable Means of Compliance and Guidance Material to be used in the certification process and to facilitate the implementation of the Basic Regulation and its implementing rules (Articles 18(c) and 19(2)).

[6] The Agency is bound to follow a structured rulemaking process as required by Article 52(1) of the Basic Regulation. Such process has been adopted by the Agency's Management Board and is referred to as the 'Rulemaking Procedure'. See Management Board Decision concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications and guidance material (Rulemaking Procedure), EASA Management Board Decision 01-2012, 13.03.2012.

[7] The ToR was published on 12 September 2011. Available under http://easa.europa.eu/rulemaking/terms-of-reference-and-group-composition.php#OPS.

7. The justification of the OPSG for this rulemaking proposal reads as follows: "The proposal should be adopted because it is a response to reports that indicate the need for measures to prevent runway incursions. It is a safety intervention that directly addresses casual factors in runway incursion occurrences. As such it is anticipated that the adoption of this proposal will have a positive effect in the reduction in the number of runway incursions."

8. Concerning taxiing, the original proposal of the OPSG suggested the following wording: "Taxiing is not a critical phase of flight, but it should be treated as a safety-critical activity". This wording defines taxiing as being a 'close-to-critical phase of flight'.

9. The Agency accepted the proposal of the OPSG in 2007 and added it to the Agency's Rulemaking Programme at that time.

10. For the proposal presented in this NPA, the Agency used in parts the original wording of the draft regulatory text as proposed by the OPSG in 2007. It has to be considered, however, that today's regulatory framework, as laid down in the Agency's Opinions 04/2011, 01/2012 and 02/2012, requests a different structure. In addition, compared to the proposal of the OPSG, the Agency proposes in this NPA to incorporate additional GM concerning the operator's responsibilities as regards the sterile flight deck (for details see below).

11. The term 'flight deck' is used in this Explanatory Note to reflect the rulemaking task title as published in the Agency's Rulemaking Programme. However, it should be noted that the term 'flight crew compartment' is used instead of 'flight deck' in the proposed NPA regulatory text for amending the Implementing Rules and the associated AMC and GM (see Section B 'Draft Opinion and Decision' of this NPA). The reason is that the same terminology must be used in the proposed rules, AMC and GM as in the already published Agency's Opinions 04/2011, 01/2012 and 02/2012 where the term 'flight crew compartment' has been used.

Background information on the concept of sterile flight deck

12. When flight crew are not concentrating their attention on the conduct of flight activities or are involved in actions that are not related to flying, critical information can be missed or misinterpreted. The situation can deteriorate very rapidly. In order to prevent those consequences, the U.S. Federal Aviation Administration (FAA) enacted in 1981 the so-called 'sterile cockpit rule'. This Regulation, as laid down in U.S Federal Aviation Regulation (FAR) 121.542[8] and 135.100[9], requires flight crew members to refrain from non-essential activities during critical phases of flight. In the FAA Regulation 'critical phases of flight' are defined as "all ground operations involving taxi, take-off and landing, and all other flight operations conducted below 10 000 feet, except cruise flight". It is worthwhile noting that:

- Both paragraphs, FAR 121.542 and FAR 135.100 contain the same text;
- Emphasis is laid on flight crew members duties during critical phases of flight;
- Emphasis is not laid on flight crew members being disturbed by cabin crew members. The Regulation just says "non-essential communications between the cabin and cockpit crews … are not required for the safe operation of the aircraft"; and
- The Regulation is quite specific in listing non-safety related activities, such as ordering galley supplies, confirming passenger connections, announcements to passengers promoting the air carrier, announcements pointing out sights of

[8] Paragraph 121.542 (flight crew member duties) of Part 121 (operating requirements: domestic, flag and supplemental operations) of Title 14 of the U.S. Code of Federal Regulations (CFR).

[9] Paragraph 135.100 (flight crew member duties) of Part 135 (operating requirements: commuter and on demand operations and rules governing persons on board such aircraft) of Title 14 of the U.S Code of Federal Regulations (CFR).

interest, eating meals, engaging in non-essential conversations, and describing these as "not required" during critical phases of flight.

13. The concept of sterile flight deck procedures is also introduced to some extent in the 'Manual on the Prevention of Runway Incursions' which was published by the International Civil Aviation Organisation (ICAO) in 2007[10]. Concerning best practice on the flight deck, the ICAO Manual provides detailed information in Appendix B ('Best practices on the flight deck'). This text was developed based on material provided by the International Air Transport Association (IATA) and by the International Federation of Air Line Pilots' Association (IFALPA). Among other issues, Appendix B of the ICAO Manual contains detailed information and guidance concerning critical phases of flight and taxi procedures, including sterile flight deck procedures. Thereby, the term 'sterile flight deck' is defined as follows:

"Any period of time when the flight crew should not be disturbed, except for matters critical to the safe operation of the aircraft"[11].

14. When compared to the U.S. Regulation, as described above, it is interesting to note that the definition provided by ICAO is focussed on disturbance of the flight crew. The definition itself does not explicitly mention any essential or non-essential activities to be carried out by the flight crew during time periods when sterile flight deck procedures have to be followed. According to the ICAO Manual "disturbances may include, but not limited to, calls received from non-operational areas (e.g. company), entry onto flight deck by cabin crew, and extraneous conversations not related to the current phase of flight"[12].

15. It should also be pointed out that the ICAO Manual, as the U.S. Regulation, explicitly proposes that the concept of a sterile flight deck should be adopted during taxiing[13] and that "the taxi phase should be treated as critical phase of flight"[14].

16. Following this approach it is concluded in the ICAO Manual that "it is generally accepted that the need for a sterile cockpit commences as follows:

    a. Departure: when the aircraft engine(s) are started and ceases when the aircraft reaches 10 000 feet elevation above the departure aerodrome;

    b. Arrival: when the aircraft reaches 10 000 feet elevation above the arrival aerodrome until the engine(s) are shut down after landing; and

    c. At any other times determined and announced by the flight crew (e.g. in-flight emergency, security alert)"[15].

17. As a result of the combined efforts of organisations within Europe representing all areas of aerodrome operations, the 'European Action Plan for the Prevention of Runway Incursions'[16] has been established. This Action Plan has been supported by leading European aviation organisations, such as EUROCONTROL, AEA, ACI Europe, EASA, etc. It contains detailed recommendations considering various aspects of runway incursions. This includes aerodrome operator issues, aircraft operator issues, air navigation service provider issues, communication, technology, etc. Appendix D ('Flight crew best practices') contains detailed information and guidance related to air operation aspects.

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10 International Civil Aviation Organisation Doc 9870 (AN/463), 'Manual on the Prevention of Runway Incursions', First Edition, 2007.

11 Glossary and Paragraph 6.3.8 of Appendix B of the ICAO Manual.

12 Paragraph 6.3.8 of Appendix B of the ICAO Manual.

13 Paragraph 4.3.4 of Chapter 4, and paragraphs 6.3.8 and 7.8 of Appendix B of the ICAO Manual.

14 Paragraph 2.3 of Appendix B of the ICAO Manual.

15 Paragraph 6.3.9 of Appendix B of the ICAO Manual.

16 European Action Plan for the Prevention of Runway Incursions, Edition 2.0. Available under https://www.eurocontrol.int/runwaysafety/public/standard_page/EuropeanAction.html.

Concerning sterile flight deck procedures, the European Action Plan in Appendix D follows the concept of the ICAO Manual as follows:

a. A definition of the term 'sterile flight deck' is offered as a reference which is the same as in the ICAO document;

b. The European Action Plan strongly advises to adopt the sterile flight deck concept whilst taxiing; and

c. The taxi phase should be treated as a critical phase of flight.

18. Furthermore, related to the sterile flight deck concept, the European Action Plan contains one recommendation (Recommendation No 1.4.5) which reads as follows: "Promote best practices in flight deck procedures while taxiing and during final approach - to include the 'sterile flight deck' concept".

Rulemaking proposals concerning the concept of sterile flight deck

19. **Rulemaking proposal No 1:** For the present rulemaking activity concerning sterile flight deck procedures, the Agency took into consideration the rulemaking proposal of the OPSG towards the Agency, the ICAO Manual, the European Action Plan and the U.S. Regulation. In order to avoid any misunderstanding as regards the term 'sterile flight deck'[17], the Agency decided that a definition of this term is needed. Such a definition could contain the following elements:

- Disturbance of the flight crew (as proposed in the ICAO Manual and in the European Action Plan); and
- In addition, restrictions towards the flight crew to only perform essential operational duties.

During the drafting process of the present NPA, the majority of the corresponding Rulemaking Group advised the Agency to limit the definition to the aspect of disturbance of the flight crew (as proposed in the ICAO Manual and in the European Action Plan). The Rulemaking Group suggested describing the flight crew's restriction to essential operational duties during sterile-flight-deck periods of time in the AMC and/or GM. After a substantial discussion, the Agency decided to follow the proposal of the Rulemaking Group; however, it proposes to add the phrase "and/or the safety of the occupants" to the definition. Therefore, the Agency proposes the following definition to be incorporated in the Implementing Rules (see B.I.1, Annex I (Definitions)):

"'Sterile flight crew compartment' means any period of time when the flight crew members are not disturbed, except for matters critical to the safe operation of the aircraft and/or the safety of the occupants."

20. **Rulemaking proposal No 2:** Aside from the definition of the sterile flight deck, procedures have to be laid down. The Agency came to the conclusion that the operators themselves are most competent in doing so. Therefore, it is proposed to amend Part-ORO of the Implementing Rules by demanding the operators to establish procedures which observe the sterile flight deck concept (see B.I.2, ORO.GEN.110). In this context it has to be noted that the requirements of Part-ORO are only to be followed by an operator conducting:

- non-commercial operations with complex motor-powered aircraft (for the present rulemaking activity these are operations under Part-NCC and, if applicable, Part-SPO); or

[17] In the proposed text for amending the Implementing Rules, AMC and GM (see Section B 'Draft Opinion and Decision' of this NPA), the term 'sterile flight crew compartment' instead of 'sterile flight deck' is used to be consistent with the term used in the Agency's Opinions 04/2011, 01/2012 and Opinion 02/2012 (see also above, last paragraph of 'General background').

- commercial operations (for the present rulemaking activity these are operations under Part-CAT and, if applicable, Part-SPO)[18].

21. **Rulemaking proposal No 3:** By taking into consideration the rulemaking proposal of the OPSG, the Agency came to the conclusion that the Implementing Rules should be accompanied by AMC to further describe what the operator responsibilities concerning sterile flight deck procedures are (see B.II.1, AMC1 ORO.GEN.110(f)). These AMC describe flight crew activities and cabin crew restrictions during sterile-flight-deck periods of time. In addition, the AMC lay down when sterile flight deck procedures should be applied:

    - During all critical phases of flight (for helicopters this includes taxiing);
    - For aeroplanes during taxiing; and
    - Below 10 000 feet above the aerodrome of departure or the aerodrome of destination, except for cruise flight.

22. Finally, the AMC include training needs. In addition, in order to further guide the operators on sterile flight deck procedures, GM on the establishment of procedures, on pre-flight briefing, on flight crew activities and on communication to the flight crew is proposed by the Agency (see B.II.1, GM1 ORO.GEN.110(f)).

Background information on taxiing of aeroplanes as a safety-critical activity

23. It is generally accepted that flight begins from the moment the parking brake is released. Since the number of ground movements on aerodromes has increased significantly over the last decades, the taxi phase requires clear procedures and full attention of the flight crew. In addition, the current generation of aircraft have highly automated and complex systems that allow the preparation and programming of the total flight to be done on the ground. This has resulted in flight crew workload peaks shifting. These peaks currently include the ground phase of aircraft operations. This evolution is irreversible, and appropriate mitigating measures should be taken. Consequently, the taxi phase needs to be treated as a safety-critical activity.

24. As pointed out above (see the paragraphs under the header 'The concept of sterile flight deck'), the situation concerning taxiing as a safety-critical activity has progressively developed as follows:

    - The FAA has a Regulation in place defining the taxi phase as a critical phase of flight for domestic, flag, supplemental operations, and commuter and on demand operations;
    - In the ICAO Manual it is proposed that the taxi phase should be treated as a critical phase of flight; and
    - The European Action Plan also recommends that the taxi phase should be treated as a critical phase of flight.

25. Within the European Union the definitions of critical phases of flight are documented in Annex I (Definitions) of the Agency's Opinion 04/2011, and are at this stage as follows:

    "'Critical phases of flight' in the case of aeroplanes means the take-off run, the take-off flight path, the final approach, the missed approach, the landing, including the landing roll, and any other phases of flight as determined by the pilot-in-command or commander.

[18] See ORO.GEN.005 'Scope' of Annex III (Part-ORO) of the Agency's Opinion No 04/2011. Consequently, Part-ORO does not cover Part-NCO and covers only in parts Part-SPO. Consequences concerning the rulemaking proposals are described below.

'Critical phases of flight' in the case of helicopters means taxiing, hovering, take-off, final approach, missed approach, the landing and any other phases of flight as determined by the pilot-in-command or commander."

26. As one can see from these definitions, for helicopters taxiing is defined as a critical phase of flight, while for aeroplanes it is not. If taxiing of aeroplanes would also become a critical phase of flight, this would have consequences for cabin crew activities. The reason is that at the present stage, e.g. the Implementing Rule in Part-CAT of the Agency's Opinion 04/2011 contains the following requirement:

"During critical phases of flight, each cabin crew member shall be seated at the assigned station and shall not perform any activities other than those required for the safe operation of the aircraft."[19]

27. Consequently, if taxiing of aeroplanes becomes a critical phase of flight, cabin crew activities would be restricted. This requirement, however, could be amended during the present rulemaking activity, e.g. by allowing cabin crew to leave their seats in order to perform safety-related duties. Considering the different sources of information (e.g. guidance given in the ICAO Manual and the European Action Plan, the present FAA Regulation and the rulemaking proposal of the JAA OPSG), the Agency had to decide on the following question:

Question: Should taxiing of aeroplanes be:

a) treated as a safety-critical activity, but not be defined as a critical phase of flight in the Implementing Rules;

b) defined as a critical phase of flight, with no restrictions to cabin crew activities (i.e. as of today cabin crew could provide service to passengers); or

c) defined as a critical phase of flight, restricting cabin crew to carry out safety-related duties only?

28. During the drafting process of the present NPA, the majority of the corresponding Rulemaking Group advised the Agency to treat taxiing of aeroplanes as a safety-critical activity, but strongly opposed to defining taxiing as a critical phase of flight[20]. This position corresponds to response 'a)' to the question above. The main reasons for this position were as follows:

- The present rulemaking activity is headed 'Sterile flight deck procedures'. Therefore, any possible restrictive consequences for cabin crew activities within the cabin would be considered as 'indirect rulemaking', which could not be accepted.
- In some cases taxiing takes one hour or even more, and therefore, cabin crew activities should not be restricted to only safety-related duties during that time frame.
- The wording used in the ICAO Manual and in the European Action Plan ('taxiing should be **treated** as a critical phase of flight') does not mean that taxiing should be **defined** as a critical phase of flight.

29. After a substantial discussion, the Agency came to the conclusion to follow the advice of the majority of the corresponding Rulemaking Group as follows:

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19 See CAT.OP.MPA.210(b) 'Cabin crew members' of Annex IV (Part-CAT) of the Agency's Opinion No 04/2011.

20 This position is identical to the proposal of the JAA OPSG in 2007 (see above under the header 'General background').

Taxiing of aeroplanes is treated as a safety-critical activity, but it is not defined as a critical phase of flight in the Implementing Rules. Consequently, no Amendment to the Implementing Rules is needed in this respect.

30. Nevertheless, the Agency is interested in stakeholders' view and is inviting comment providers to indicate their preferred response concerning the question raised above during the consultation process.

Rulemaking proposal concerning taxiing of aeroplanes as a safety-critical activity

31. **Rulemaking proposal No 4:** Aside from the far-reaching decision discussed above, the Agency felt the need to give some explanation in the GM why taxiing of aeroplanes has to be treated as a safety-critical activity. On the one hand there are risks related to the movement and the potential for a catastrophic event on the ground, on the other hand taxiing is a high-workload phase that requires the full attention of the flight crew. Consequently, the Agency proposes nearly identical text for the GM on these items for Part-CAT (see B.II.2, GM1 CAT.GEN.MPA.125), for Part-NCC (see B.II.3, GM1 NCC.GEN.120), for Part-NCO (see B.II.4, GM2 NCO.GEN.115) and for Part-SPO (see B.II.5, GM1 SPO.GEN.120).

Background information on procedures for taxiing to enhance runway safety

32. As mentioned above, the increase in traffic together with the complexity of aerodrome layout has resulted in an increase in flight crew workload during the taxi phase. The challenge is to manage this workload to enhance runway safety including the prevention of runway incursions and excursions. Runway incursions and excursions are a major risk to the safety of aircraft and have the potential to be catastrophic.

33. Several accidents and incidents made clear that the safety of ground operations needs to be improved. A key point in enhancing runway safety is to apply better preventative measures during the taxi phase. This includes operating procedures for taxiing. By managing the workload, the flight crew will be able to allow for increased attention to planning and briefing of this safety-critical phase, thus providing enhanced situational awareness.

34. The ICAO Manual and the European Action Plan contain detailed background information, recommendations, best practices and guidance to improve the safety of ground operations. The documents cover various areas in and various aspects of preventing runway incursions. As mentioned above, detailed information and guidance concerning air operations is provided in Appendix B of the ICAO Manual and in Appendix D of the European Action Plan.

35. In addition, it should be mentioned that the FAA published a Safety Alert for Operators (SAFO) on 'Runway Incursion Prevention Actions'[21] and an Advisory Circular on 'Flight Crew Procedures during Taxi Operations'[22]. Both documents contain detailed recommendations to enhance runway safety mainly covering the following areas: planning, situational awareness, use of written taxi instructions, crew resource management, communication, taxiing and exterior lighting.

36. It was already pointed out that the major basis for the present rulemaking activity was the proposal submitted by the OPSG in 2007. The Agency, however, also considered the information and guidance given in the ICAO Manual, the European Action Plan, and in the FAA SAFO and the FAA Advisory Circular when drafting regulatory text on procedures for

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21 FAA Safety Alert for Operators (SAFO) 11004, 'Runway Incursions Prevention Actions', 10 June 2011. Available under http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo.

22 FAA Advisory Circular AC No. 120-74A, 'Parts 91, 121, 125, and 135 Flight Crew Procedures during Taxi Operations', 26 September 2003. Available under http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/23220.

taxiing to enhance runway safety. The Agency's proposals concerning AMC and GM related to procedures for taxiing are described in the following paragraphs.

Rulemaking proposals concerning procedures for taxiing to enhance runway safety

37. **Rulemaking proposal No 5:** The Agency felt the need to address in the Implementing Rules procedures for taxiing of aircraft. The Agency came to the conclusion that the operator should be obliged to establish such procedures to ensure safe operation and to enhance runway safety. Consequently, such a rule is proposed for Part-CAT (see B.I.3, CAT.GEN.MPA.125), for Part-NCC (see B.I.4, NCC.GEN.120) and for Part-SPO (see B.I.6, SPO.GEN.120). The Agency is of the opinion that such a rule is not needed for Part-NCO, since this would mean to overregulate taxiing of non-commercial operations of other-than-complex motor-powered aircraft[23].

38. **Rulemaking proposal No 6:** Concerning taxiing of aircraft to enhance runway safety, the Agency felt the need to propose, apart from the Implementing Rules described above, AMC for Part-CAT, Part-NCC and Part-SPO. This AMC material is supposed to indicate to operators which areas have to be covered when establishing procedures for the taxi phase. The AMC for Part-CAT (see B.II.2, AMC1 CAT.GEN.MPA.125), for Part-NCC (see B.II.3, AMC1 NCC.GEN.120) and for Part-SPO (see B.II.5, AMC1 SPO.GEN.120) propose that the procedures for taxiing include at least the following four areas:

    a. Application of the sterile flight deck procedures;

    b. Use of standard radiotelephony (RTF) phraseology;

    c. Use of available aircraft lights; and

    d. Measures to enhance the situational awareness of the flight crew.

39. The first item of this list, the application of the sterile flight deck, has been discussed above. Concerning the second item, standard RTF phraseology, it is worth pointing out that there is a wide variation in the quality of RTF phraseology being used in day-to-day operations. The use of standard RTF phraseology is not generally monitored during line operations or recurrent training. The use of standard RTF phraseology as a best practice approach could be reinforced, among other measures, by the proposed AMC.

40. The use of available aircraft lights (third item on the list above) improves the sight of the flight crew and visibility of the aircraft to others. Therefore, it is a measure to enhance runway safety and should be included in the procedures for taxiing.

41. The last item of the above list contains various sub-items to enhance the situational awareness of the flight crew related to aerodrome layout charts, taxi clearances, cross of runway, disturbances, low visibility conditions, etc. The list of these various sub-items is meant to cover, among others, the following issues, which should be considered by the operator when establishing procedures for taxiing:

    - Pilot factors that may result in a runway incursion or excursion include inadvertent non-compliance with air traffic control clearances. Often these cases result from a breakdown in communications or from a loss of situational awareness in which the flight crew think that they are at one location on the aerodrome while they are actually elsewhere, or the flight crew believe that the clearance issued was to enter the runway, when in fact it was not.

    - During taxiing preferably both pilots (if two pilots are required) should be looking outside and should check the taxi routing. If a runway change or intersection change or performance recalculation is required, then it is advised to stop the aircraft and to do the required items after the parking brakes are set.

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[23] Although no Implementing Rule is proposed for Part-NCO, the Agency is of the opinion that GM for taxiing of Part-NCO aeroplanes should be introduced (see below).

- The primary responsibility of the pilot monitoring should be to actively monitor both the control actions of the pilot taxiing and the progress of the aircraft against aerodrome charts. Adopting this approach in assessing and dealing with the potential threats, while minimising disturbances, will enhance the safety during the taxi phase.

42. **Rulemaking proposal No 7:** Concerning Part-NCO no additional Implementing Rules are proposed for taxiing of aeroplanes to enhance runway safety (see above). Therefore, the Agency does not propose AMC on this issue either. The Agency, however, sees the need to establish GM to further explore which procedures the pilot-in-command should observe during taxiing. The proposed GM for Part-NCO is based on the AMC for Part-CAT, Part-NCC and Part-SPO as described above, but the text has been adjusted and simplified to better reflect non-commercial operations of other-than-complex motor-powered aircraft. For the proposed text see B.II.4, GM1 NCO.GEN.115[24].

The Agency's duty to address safety recommendations

43. When linked to a rulemaking task, the Agency has the duty to address safety recommendations in its deliberations during the rulemaking process. The investigation of the accident involving a McDonnell Douglas DC-9-82 at Madrid-Barajas Airport on 20 August 2008 led to several safety recommendations. The following safety recommendations are linked to the present rulemaking tasks:

    a. *SPAN-2011-021: It is recommended that the European Aviation Safety Agency (EASA), in keeping with ICAO initiatives, introduce in its regulations the **concept of critical phases of flight** and define those activities considered acceptable during said phases.*

    b. *SPAN-2011-022: It is recommended that the European Aviation Safety Agency (EASA) and national civil aviation authorities, when evaluating operator training programmes, ensure that:*

        - *The **concept of sterile cockpit** is highlighted;*
        - *The importance of adhering to said concept is stressed, along with the consequences of even minor disturbances; and*
        - *Examples and accidents are included in which non-compliance with regulations involving the sterile cockpit was a relevant factor.*

44. It can be stated that the 'concept of critical phases of flight' is already embedded in the existing rules for commercial air transport by aeroplane (Commission Regulation (EC) No 859/2008[25]), and also in future Implementing Rules, e.g. as follows:

    - Definitions of 'critical phases of flight' are provided in Annex I (Definitions) of the Agency' Opinion No 04/2011; and
    - Implementing Rules for activities considered acceptable during critical phases of flight are provided in Part-ORO[26], Part-CAT[27], Part-NCC[28], Part NCO[29] and Part-SPO[30].

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24 As mentioned above, the requirements of Part-ORO are not valid for Part-NCO. Therefore, the Implementing Rules, AMC and GM concerning the sterile flight deck procedures, as established in Part-ORO, are not applicable to Part-NCO. As a consequence, phrases explicitly describing the sterile flight deck procedures are introduced as No 1 and 2 of GM1 NCO.GEN.115 (see B.II.4).

25 Commission Regulation (EC) No 859/2008 of 20 August 2008 amending Council Regulation (EEC) No 3922/91 as regards common technical requirements and administrative procedures applicable to commercial transportation by aeroplane (OJ L 254, 20.9.2008, p. 1).

26 ORO.GEN.110(f) of Annex III (Part-ORO) of the Agency's Opinion 04/2011.

27 CAT.GEN.MPA.105(a)(9) and CAT.OP.MPA.210(b) of Annex IV (Part-CAT) of the Agency's Opinion No 04/2011.

28 NCC.GEN.105(b) of Annex VI (Part-NCC) of the Agency's Opinion No 01/2012.

45. The present rulemaking tasks address the safety recommendations SPAN-2011-021 and SPAN-2011-022 even further with the following measures:

- Introducing the definition of 'sterile flight deck';
- Establishing the relationship between 'sterile flight deck' and 'critical phases of flight';
- Establishing the taxi phase as a safety-critical activity of flight and providing procedures for taxiing;
- Providing AMC on training of crew members concerning sterile flight deck procedures; and
- Providing GM on activities considered acceptable and considered not acceptable during times of sterile flight deck.

Envisaged changes to Implementing Rules and AMC/GM

46. As described above, the purpose of the proposed Implementing Rules and the associated AMC and GM is:

a. to introduce the concept of a **sterile flight deck**;

b. to establish taxiing of aeroplanes as a **safety-critical activity**; and

c. to provide **procedures for taxiing** to enhance runway safety.

47. This NPA, therefore, proposes to amend the following rules:

- Commission Regulation (EU) No xxxx/201x[31]; and
- Decision No 201x/xxx/R of the Executive Director of the European Safety Agency of dd Month 201x[32].

48. The proposed rule has taken into account the development of European Union and international law (ICAO), and harmonisation with the rules of authorities of the European Union's main partners as set out in the objectives of Article 2 of the Basic Regulation. The proposed rule:

a. takes into account the current status of the relevant European Union legislation;

b. does not deviate from the ICAO 'Manual on the Prevention of Runway Incursions';

c. is, for reasons described above, not fully harmonised with the Regulation of the FAA (FAR 121.542 and FAR 135.100).

49. The proposed Implementing Rules, AMC and GM for amending the Commission Regulation on air operations and the Decision of the Executive Director of the Agency are shown in Section B of this NPA.

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29 NCO.GEN.105(b) of Annex VII (Part-NCO) of the Agency's Opinion 01/2012.

30 SPO.GEN.105(b) of Annex VIII (Part-SPO) of the Agency's Opinion 02/2012.

31 This Commission Regulation is based on the Agency's Opinions No 04/2011, No 01/2012 and 02/2012.

32 The Agency's Decision can only be published after the Commission Regulation has been amended. Therefore, for the resulting text at this stage see:

(1) Annex I (Definitions) and Annex IV (Part-CAT): CRD, dated 25 November 2010, to NPA 2009-02b;

(2) Annex III (Part-ORO): CRD, dated 4 October 2010, to NPA 2008-22c and 2009-02c;

(3) Annex VI (Part-NCC): CRD, dated 30 August 2011, to NPA 2009-02b;

(4) Annex VII (Part-NCO): CRD, dated 30 August 2011, to NPA 2009-02b;

(5) Annex VIII (Part-SPO): CRD, dated 27 October 2011, to NPA 2009-02b.

Available under http://easa.europa.eu/rulemaking/r-archives.php.

IV. Summary Regulatory Impact Assessment

50. The complete Regulatory Impact Assessment (RIA) related to the present rulemaking tasks can be found in Section C of this NPA. The options identified in the RIA are as follows:

    a. Option 0: Baseline option (no change; risks remain as outlined in the issue analysis).

    b. Option 1: No rulemaking, but encouraging operators to establish procedures, as needed.

    c. Option 2: Rulemaking for sterile flight deck procedures for all critical phases of flight, for taxiing of aeroplanes and for flight below 10 000 feet, except cruise flight, by amending Implementing Rules, AMC and GM, as appropriate.

    Taxiing of aeroplanes is treated as a safety-critical activity, but it is not defined as a critical phase of flight.

    d. Option 3: Rulemaking for sterile flight deck procedures for all critical phases of flight and for flight below 10 000 feet, except cruise flight, by amending Implementing Rules, AMC and GM, as appropriate.

    Taxiing of aeroplanes is defined as a critical phase of flight.

51. The most important impacts identified in the RIA for each option are the safety, the economic and the harmonisation impact. In the RIA it is concluded that Option 2 is the preferred option. The main reason is that this option leads to a high reduction of the safety risk with a reasonable impact on costs. The costs of Option 3 are expected to be significantly higher than the ones of Option 2 due to the additional burden of defining taxiing as a critical phase of flight, while the reduction of the safety risk is only slightly lower. In addition, Option 2, in contrast to Options 0 and 1, does not deviate from the ICAO Manual and the European Safety Plan.

V. How to comment on this NPA

52. Comments to this NPA may be submitted to the Agency within 3 months as of the date of publication in accordance with Article 6(4) of the Rulemaking Procedure.

53. Comments should be submitted by one of the following methods:

    CRT: Please submit your comments using the automated Comment-Response Tool (CRT) available at **http://hub.easa.europa.eu/crt/**.

The deadline for submission of comments is **11 October 2012**.

VI. Next steps

54. Following the closing of the NPA consultation, the Agency will consider all comments and will publish a Comment-Response Document (CRD). The CRD will be available on the Agency's website and in the Comment-Response Tool (CRT).

55. Following the CRD publication, the Agency will perform a final review and publish the Opinion and Decision in due course.

B. Draft Opinion and Decision

The text of the amendment is arranged to show deleted text, new text or new paragraph as shown below:

1. deleted text is shown with a strike through: ~~deleted~~
2. new text is highlighted with grey shading: new
3. …

indicates that remaining text is unchanged in front of or following the reflected amendment.

I. Draft Opinion

FOR AMENDING COMMISSION REGULATION (EC) NO xxxx/201x

B.I.1 Annex I: Definitions for terms used in Annexes II-VIII

…

'Sterile flight crew compartment' means any period of time when the flight crew members are not disturbed, except for matters critical to the safe operation of the aircraft and/or the safety of the occupants.

…

B.I.2 Annex III: Part-ORO - organisations requirements for air operations

…

ORO.GEN.110 Operator responsibilities

…

(f) An operator shall establish procedures and instructions for the safe operation of each aircraft type, containing ground staff and crew member duties and responsibilities, for all types of operation on the ground and in flight. These procedures and instructions shall not require crew members to perform any activities during critical phases of flight other than those required for the safe operation of the aircraft and ensure that the sterile flight crew compartment procedures be observed.

…

B.I.3 Annex IV: Part-CAT – commercial air transport

…

CAT.GEN.MPA.125 Taxiing of aircraft

The operator shall establish procedures for taxiing to ensure safe operation and to enhance runway safety.

CAT.GEN.MPA.~~125~~126 Taxiing of aeroplanes

…

B.I.4 Annex VI: Part-NCC – non-commercial operations of complex motor-powered aircraft

…

NCC.GEN.120 Taxiing of aircraft

The operator shall establish procedures for taxiing to ensure safe operation and to enhance runway safety.

CAT.GEN.MPA.~~120~~121 Taxiing of aeroplanes

…

B.I.5 Annex VII: Part-NCO – non-commercial operations of other-than-complex motor-powered aircraft

…

NCO.GEN.115 Taxiing of aeroplanes[33]

An aeroplane shall only be taxied on the movement area of an aerodrome if the person at the controls:

(a) is an appropriately qualified pilot; or

(b) has been designated by the operator and:

(1) is trained to taxi the aircraft;

(2) is trained to use the radio telephone, if radio communications are required;

(3) has received instruction in respect of aerodrome layout, routes, signs, marking, lights, air traffic control (ATC) signals and instructions, phraseology and procedures; and

(4) is able to conform to the operational standards required for safe aeroplane movement at the aerodrome.

…

B.I.6 Annex VIII: Part-SPO – specialised operations

…

SPO.GEN.120 Taxiing of aircraft

The operator shall establish procedures for taxiing to ensure safe operation and to enhance runway safety.

SPO.GEN.~~120~~121 Taxiing of aeroplanes

…

[33] It is not planned to modify NCO.GEN.115. However, since GM to NCO.GEN.115 is introduced (see II. Draft Decision), the present text is provided for ease of reference.

II. Draft Decision

FOR AMENDING DECISION NO 201x/xxx/R OF THE EXECUTIVE DIRECTOR OF THE EUROPEAN AVIATION SAFETY AGENCY OF dd MONTH 201x

B.II.1 AMC/GM to Annex III: Part-ORO – organisations requirements for air operations

…

AMC1 ORO.GEN.110(f) Operator responsibilities

STERILE FLIGHT CREW COMPARTMENT

1. Sterile flight crew compartment procedures should ensure that:
   a. flight crew activities are restricted to essential operational activities; and
   b. cabin crew and technical crew communications to or entry into the flight crew compartment are restricted to safety or security matters.
2. The sterile flight crew compartment procedures should be applied:
   a. during critical phases of flight;
   b. during taxiing;
   c. below 10 000 feet above the aerodrome of departure or the aerodrome of destination, except for cruise flight.
3. All crew members should be trained on sterile flight crew compartment procedures established by the operator, as appropriate to their duties.

GM1 ORO.GEN.110(f) Operator responsibilities

STERILE FLIGHT CREW COMPARTMENT

1. Establishment of procedures

The operator should establish procedures for flight, cabin and technical crew that emphasise the objectives and importance of the sterile flight crew compartment. These procedures should also emphasise that, during periods of time when the sterile flight deck compartment procedures are applied, cabin crew and technical crew members should call the flight crew or enter the flight crew compartment only in cases of great urgency. In such cases information should be timely and accurate.

2. Pre-flight briefing

Prior to the flight, during the preparation phase, the pilot-in-command or commander recalls the objectives and importance of the sterile flight crew compartment.

3. Flight crew activities
   a. When the sterile flight crew compartment procedures are applied, the flight crew are focused on their essential operational activities without being disturbed by non-flight related matters.
   b. Examples of activities that should not be performed are:
      i. radio calls concerning passenger connections, fuel loads, catering, etc.;
      ii. announcements concerning sights of interest, proposed route etc.;
      iii. non-critical paperwork;
      iv. reading publications not related to the conduct of the flight;
      v. eating and drinking;

vi. non-essential conversations (remarks not pertinent to safe aircraft operation) within the flight crew compartment and non-essential communications between the cabin and the flight crew;

vii. mass and balance corrections, performance calculations, unless required for safety reasons; and

viii. any use of Electronic Flight Bags (EFB) unless urgently necessary.

c. Examples of activities that may be performed are:

i. use of checklists;

ii. crew coordination procedures;

iii. discussion of minimum equipment list (MEL) items with the company or other personnel; and

iv. communications inside or outside the aircraft essential to the safe operation of the aircraft and the safety of occupants.

4. Communication to the flight crew

Cabin crew and technical crew use their own discretion to determine whether the situation is critical and whether to call the flight crew. Critical situations requiring information to the flight crew may include:

a. any outbreak of fire inside the cabin or in an engine;

b. a burning smell in the cabin or presence of smoke inside or outside;

c. fuel or fluid leakage;

d. exit door unable to be armed or disarmed;

e. localised extreme cabin temperature changes;

f. evidence of airframe icing;

g. cabin/galley equipment or furniture malfunction/breakage posing a hazard to the occupants;

h. suspicious object;

i. unruly passenger;

j. security threat;

k. abnormal vibration or noise;

l. medical emergency;

m. general drop-down of the oxygen masks in the cabin; and

n. any other condition deemed relevant by a cabin crew or technical crew member.

…

B.II.2 AMC/GM to Annex IV: Part-CAT – commercial air transport

…

AMC1 CAT.GEN.MPA.125 Taxiing of aircraft

PROCEDURES FOR TAXIING

Procedures for taxiing should include at least the following:

1. application of the sterile flight crew compartment procedures;

2. use of standard radiotelephony (RTF) phraseology;

3. use of lights as follows:

   a. strobe lights, when entering or crossing a runway (active or inactive); and

   b. landing lights for take–off;

4. measures to enhance the situational awareness of the minimum required flight crew members, such as:

   a. each flight crew member should have the necessary aerodrome layout charts available;

   b. all taxi clearances should be recorded and should be understood by each flight crew member;

   c. all taxi clearances should be cross-checked against the aerodrome chart and aerodrome surface markings, signs and lights;

   d. an aircraft taxiing on the manoeuvring area shall stop and hold at all lighted stop bars, and may proceed further when an explicit clearance to enter or cross the runway has been issued by the aerodrome control tower and when the stop bar lights are switched off;

   e. if the pilot taxiing the aircraft is unsure of his/her position, he/she should stop the aircraft and contact air traffic control;

   f. the pilot monitoring should monitor the taxi progress and adherence to the clearances and should assist the pilot taxiing;

   g. any action which may disturb the flight crew from the taxi activity should be avoided or done with the parking brake set (e.g. announcements by public address); and

   h. in low visibility conditions, additional cross-checks of flight instruments information should be carried out.

GM1 CAT.GEN.MPA.125 Taxiing of aircraft

SAFETY-CRITICAL ACTIVITY

1. Taxiing should be treated as a safety-critical activity due to the risks related to the movement of the aircraft and the potential for a catastrophic event on the ground.

2. Taxiing is a high-workload phase of flight that requires the full attention of the flight crew.

…

B.II.3 AMC/GM to Annex VI: Part-NCC – non-commercial operations of complex motor-powered aircraft

…

AMC1 NCC.GEN.120 Taxiing of aircraft

PROCEDURES FOR TAXIING

Procedures for taxiing should include at least the following:

1. application of the sterile flight crew compartment procedures;

2. use of standard radiotelephony (RTF) phraseology;

3. use of lights as follows:

a. strobe lights, when entering or crossing a runway (active or inactive); and

b. landing lights for take–off;

4. measures to enhance the situational awareness of the minimum required flight crew members, such as:

a. each flight crew member should have the necessary aerodrome layout charts available;

b. all taxi clearances should be recorded, and should be understood by each flight crew member;

c. all taxi clearances should be cross-checked against the aerodrome chart and aerodrome surface markings, signs and lights;

d. an aircraft taxiing on the manoeuvring area shall stop and hold at all lighted stop bars, and may proceed further when an explicit clearance to enter or cross the runway has been issued by the aerodrome control tower and when the stop bar lights are switched off;

e. if the pilot taxiing the aircraft is unsure of his/her position, he/she should stop the aircraft and contact air traffic control;

f. the pilot monitoring should monitor the taxi progress and adherence to the clearances and should assist the pilot taxiing;

g. any action which may disturb the flight crew from the taxi activity should be avoided or done with the parking brake set (e.g. announcements by public address); and

h. in low visibility conditions, additional cross-checks of flight instruments information should be carried out.

GM1 NCC.GEN.120 Taxiing of aircraft

SAFETY-CRITICAL ACTIVITY

3. Taxiing should be treated as a safety-critical activity due to the risks related to the movement of the aircraft and the potential for a catastrophic event on the ground.

4. Taxiing is a high-workload phase of flight that requires the full attention of the flight crew.

…

B.II.4 AMC/GM to Annex VII: Part-NCO – non-commercial operations of other-than-complex motor-powered aircraft

…

GM1 NCO.GEN.115 Taxiing of aeroplanes

PROCEDURES FOR TAXIING

The pilot-in-command should observe the following during taxiing:

1. perform only essential operational activities;

2. not being disturbed except for matters critical to the safe operation of the aircraft and/or the safety of the occupants;

3. use of standard radiotelephony (RTF) phraseology;

4. use of lights as follows:

a. strobe lights, when entering or crossing a runway (active or inactive); and

b. landing lights for take–off;

5. measures to enhance the situational awareness of the pilot-in-command, such as:

a. the pilot-in-command should have the necessary aerodrome layout charts available;

b. if applicable, all taxi clearances should be recorded, and should be understood by the pilot-in-command;

c. if applicable, all taxi clearances should be cross-checked against the aerodrome chart and aerodrome surface markings, signs and lights;

d. an aeroplane taxiing on the manoeuvring area shall stop and hold at all lighted stop bars, and may proceed further when an explicit clearance to enter or cross the runway has been issued by the aerodrome control tower and when the stop bar lights are switched off;

e. if the pilot-in-command is unsure of his/her position, he/she should stop the aircraft and contact air traffic control; and

f. any action, which may disturb the pilot-in-command from the taxi activity, should be avoided or done with the parking brake set.

…

GM2 NCO.GEN.115 Taxiing of aeroplanes

SAFETY-CRITICAL ACTIVITY

1. Taxiing should be treated as a safety-critical activity due to the risks related to the movement of the aeroplane and the potential for a catastrophic event on the ground.

2. Taxiing is a high-workload phase of flight that requires the full attention of the pilot-in-command.

…

B.II.5 AMC/GM to Annex VIII: Part-SPO – specialised operations

…

AMC1 SPO.GEN.120 Taxiing of aircraft

PROCEDURES FOR TAXIING

Procedures for taxiing should include at least the following:

1. application of sterile flight deck crew compartment procedures or similar procedures:

a. by performing only essential operational activities;

b. by not being disturbed except for matters critical to the safe operation of the aircraft and/or the safety of the occupants;

2. use of standard radiotelephony (RTF) phraseology;

3. use of lights as follows:

a. strobe lights, when entering or crossing a runway (active or inactive); and

b. landing lights for take–off;

4. measures to enhance the situational awareness of the pilot-in-command, such as:

a. the pilot-in-command should have the necessary aerodrome layout charts available;

b. if applicable, all taxi clearances should be recorded, and should be understood by the pilot-in-command;

c. if applicable, all taxi clearances should be cross-checked against the aerodrome chart and aerodrome surface markings, signs and lights;

d. an aircraft taxiing on the manoeuvring area shall stop and hold at all lighted stop bars, and may proceed further when an explicit clearance to enter or cross the runway has been issued by the aerodrome control tower and when the stop bar lights are switched off;

e. if the pilot-in-command is unsure of his/her position, he/she should stop the aircraft and contact air traffic control;

f. any action, which may disturb the pilot-in-command from the taxi activity, should be avoided or done with the parking brake set; and

h. if applicable, in low visibility conditions, additional cross-checks of flight instruments information should be carried out.

GM1 SPO.GEN.120 Taxiing of aircraft

SAFETY-CRITICAL ACTIVITY

1. Taxiing should be treated as a safety-critical activity due to the risks related to the movement of the aircraft and the potential for a catastrophic event on the ground.

2. Taxiing is a high-workload phase of flight that requires the full attention of the flight crew.

C. Regulatory Impact Assessment

1 Process and consultation

The text of this Regulatory Impact Assessment (RIA) was developed by the Agency considering the input of the corresponding Rulemaking Group and it relates to the following rulemaking tasks:

- RMT.0416 (OPS.009(a)), Implementing Rules; and
- RMT.0417 (OPS.009(b)), Acceptable Means of Compliance (AMC) and Guidance Material (GM).

The related Preliminary Regulatory Impact Assessment (Pre-RIA) could be used to prepare this RIA, but only to a limited extent for the following reasons:

- The Pre-RIA on OPS.009, entitled 'Runway incursions', was limited to operations on the ground.
- Concerning operations on the ground, the Pre-RIA had a broader scope by considering operations and also aerodrome-related aspects.
- The Pre-RIA was published by the Agency in 2008, and therefore, the Agency's 'former' Pre-RIA format was used. This includes a more simple approach concerning the technical discussion.

The Terms of Reference (ToR) of these rulemaking tasks were submitted for consultation to the consultative bodies of the Agency, namely the Advisory Group of National Authorities (AGNA) and the Safety Standards Consultative Committee (SSCC). After this consultation, the ToR were published on the Agency's website on 12 September 2011.

2 Issue analysis and risk assessment

This chapter summarises the available evidence related to the current situation and explains why a change to the regulatory framework may be needed.

2.1 What is the issue and the current regulatory framework?

Over the years it has been identified that an accident or an incident may occur when the flight crew divert their attention from the task at hand, and become occupied with activities not directly related to the current phase of flight. Such activities are: extraneous conversations, cabin crew calls on non-essential matters, non-pertinent radio calls, public address announcements, etc.

In light of these occurrences[34], the flight crew must be able to focus on their duties without being disturbed by non-flight related matters, whenever necessary during movement of the aircraft. Implementing Rules and associated AMC and GM for air operations are in force or will be in force in the foreseeable future (when the Agency's Opinions 04/2011[35], 01/2012[36] and 02/2012[37] have been adopted by the Commission).

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[34] E.g. the accident of a McDonnell Douglas DC-9-82 at Madrid-Barajas Airport on 20 August 2008 which led to two Safety Recommendations related to the subject.

[35] Opinion No 04/2011 of the European Aviation Safety Agency of 1 June 2011 for a Commission Regulation establishing Implementing Rules for air operations 'Air Operations–OPS'. This Opinion contains DEF (definitions), Part-ORO (organisation requirements) and Part-CAT (commercial air transport) relevant for the present rulemaking activity. Available under http://www.easa.europa.eu/agency-measures/opinions.php.

[36] Opinion No 01/2012 of the European Aviation Safety Agency of 1 February 2012 for a Commission Regulation establishing the Implementing Rules for air operations 'Air Operations–OPS (Part-NCC and Part-NCO)'. This Opinion contains Part-NCC (non-commercial operations of complex motor-

However, even then the following elements will not be included in the regulatory framework for air operations:

a. The concept of a **sterile flight deck**;

b. The taxi phase of aeroplanes as a **safety-critical activity**; and

c. **Procedures for taxiing** to enhance runway safety.

The concept of a sterile flight deck (Item (a) on the list) describes any period of time when the flight crew shall not be disturbed except for matters critical to the safe operation of the aircraft and/or the safety of its occupants. The FAA introduced the so-called 'Sterile cockpit rule' in 1981[38]. In addition, the concept is introduced in the ICAO 'Manual on the Prevention of Runway Incursions'[39] and in the 'European Action Plan for the Prevention of Runway Incursions'[40]. Therefore, it is deemed necessary to incorporate procedures for a sterile flight deck in the European regulatory framework.

It is generally accepted that flight begins from the moment the parking brake is released. Since the number of ground movements on aerodromes has increased significantly over the last decades, the taxi phase requires clear procedures and full attention of the flight crew. Concerning taxiing being a safety-critical activity (Item (b) on the list above) the situation has progressively developed as follows:

- The FAA has a Regulation in place ('sterile cockpit rule', see above) defining the taxi phase as a critical phase of flight for domestic, flag, supplemental operations, and commuter and on demand operations;
- In the ICAO Manual it is proposed that the taxi phase should be treated as a critical phase of flight; and
- The European Action Plan also recommends that the taxi phase should be treated as a critical phase of flight.

Within the European Union the definitions of critical phases of flight are documented in Annex I (Definitions) of the Agency's Opinion 04/2011. These definitions lay down taxiing of helicopters as a critical phase of flight, whilst it is not so in the case of aeroplanes.

As mentioned above, the increase in traffic has resulted in an increase in flight crew workload during the taxi phase. The challenge is to manage this workload to enhance runway safety. Runway incursions and excursions are a major risk to the safety of the aircraft and its occupants, and have the potential to be catastrophic.

As a consequence, the safety of ground operations needs to be improved. A key point in enhancing runway safety is to apply better preventative measures during the taxi phase. This includes operating procedures for taxiing (Item (c) on the list above). By improving the workload management, the situational awareness and the attention of the flight crew to the conduct of this safety-critical activity will also be increased.

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powered aircraft) and Part-NCO (non-commercial operations of other-than-complex motor-powered aircraft) relevant for the present rulemaking activity. Available under http://www.easa.europa.eu/agency-measures/opinions.php.

37 Opinion No 02/2012 of the European Aviation Safety Agency of 16 April 2012 for a Commission Regulation establishing the Implementing Rules for air operations 'Air Operations–OPS (Part-SPO)'. This Opinion contains Part-SPO (specialised operations) relevant for the present rulemaking activity. Available under http://www.easa.europa.eu/agency-measures/opinions.php.

38 Title 14 of the U.S. Code of Federal Regulations (CFR); Paragraph 121.542 (flight crew member duties) of Part 121 (operating requirements: domestic, flag and supplemental operations), and Paragraph 135.100 (flight crew member duties) of Part 135 (operating requirements: commuter and on demand operations and rules governing persons on board such aircraft).

39 International Civil Aviation Organisation (ICAO) Doc 9870 (AN/463) 'Manual on the Prevention of Runway Incursions', First Edition, 2007.

40 European Action Plan for the Prevention of Runway Incursions, Edition 2.0. Available under https://www.eurocontrol.int/runwaysafety/public/standard_page/EuropeanAction.html.

In order to further demonstrate the need for action, the accident involving a McDonnell Douglas DC-9-82 at Madrid-Barajas Airport on 20 August 2008 should be mentioned. The investigation of this accident has led to several safety recommendations. Two of these safety recommendations are directly linked to the present rulemaking tasks:

a. *SPAN-2011-021: It is recommended that the European Aviation Safety Agency (EASA), in keeping with ICAO initiatives, introduce in its regulations the concept of **critical phases of flight** and define those activities considered acceptable during said phases.*

b. *SPAN-2011-022: It is recommended that the European Aviation Safety Agency (EASA) and national civil aviation authorities, when evaluating operator training programmes, ensure that:*

- *The concept of **sterile cockpit** is highlighted;*
- *The importance of adhering to said concept is stressed, along with the consequences of even minor distractions; and*
- *Examples and accidents are included in which non-compliance with regulations involving the sterile cockpit was a relevant factor.*

2.2 Who is affected?

Concerning Rulemaking Tasks RMT.0416 and RMT.0417, the key players affected are air operators, flight crew and to some extent cabin crew and technical crew. Under certain circumstances airports are also affected (see below). The measures affect commercial air transport (CAT), non-commercial operations of complex motor-powered aircraft (NCC) and of other-than-complex motor-powered aircraft (NCO), and specialised operations (SPO).

2.3 What are the safety risks?

At this stage no EU regulatory measures are in place concerning:

a. Sterile flight deck procedures;

b. Taxiing of aeroplanes as a safety-critical activity; and

c. Procedures for taxiing to enhance runway safety.

Past experience indicates that the risk of accidents and incidents can be reduced by introducing such measures.

Concerning the probability of occurrence, the Agency considers the number of accidents as 'remote', i.e. the occurrence is unlikely, but possible to occur (in this context 'remote' describes those failure conditions that are unlikely to occur to each aircraft within a category during its total life but that may occur several times when considering a specific type of operation).

If such an accident occurs during an operation, the severity of occurrence can be considered 'catastrophic' in extreme cases. This implies multiple deaths (three and more) and equipment destroyed.

A regulatory framework in place containing the above-listed elements would lower the risk of an accident or a serious incident. It has to be emphasised, however, that even with measures in place the safety risk remains to a certain extent. The U.S. Aviation Safety Reporting System reviewed 63 reports that had been coded by analysts as having some relevance to the 'sterile cockpit rule' which has been in place in the U.S. since 1981. The synopsis showed that the following problems which are described in the reports could be attributed to violations of the sterile flight deck procedures:

- Altitude and course deviations;
- Runway transgressions;
- General distractions with no specific adverse consequences;

- Take-offs and landings without clearance; and
- Near mid-air collisions due to inattention and distractions[41].

3 Objectives

The overall objectives of the Agency are defined in Article 2 of Regulation (EC) No 216/2008 (the Basic Regulation). This proposal will contribute to the overall objectives by addressing the issues outlined in Section 2. Therefore, the specific objective of this proposal is to maintain a high level of safety by considering implementing operational procedures and best practices including sterile flight deck procedures.

4 Identification of options

In order to achieve the above objective, the options below were identified.

Table 1: Selected policy options

Option No	Description
0	Baseline option (no change; risks remain as outlined in the issue analysis).
1	No rulemaking, but encouraging operators to establish procedures, as needed.
2	Rulemaking for sterile flight deck procedures for all critical phases of flight, for taxiing of aeroplanes and for flight below 10 000 feet, except cruise flight, by amending Implementing Rules, AMC and GM, as appropriate. Taxiing of aeroplanes is treated as a safety-critical activity, but it is not defined as a critical phase of flight.
3	Rulemaking for sterile flight deck procedures for all critical phases of flight and for flight below 10 000 feet, except cruise flight, by amending Implementing Rules, AMC and GM, as appropriate. Taxiing of aeroplanes is defined as a critical phase of flight.

5 Analysis of impacts

In this section the major impacts of the options identified are discussed. For each option safety, environmental, economic and social impacts are considered as well as regulatory harmonisation issues.

5.1 Safety impact

Option 0 is defined as the 'no change option'. This option means that no sterile flight deck procedures would be introduced, that taxiing of aeroplanes would not become a safety-critical activity and that no procedures to enhance runway safety during taxiing would be incorporated. Operators may have established such procedures on their own initiative. This

[41] The Aviation Safety Reporting System (ASRS) Directline Issue No. 4, June 1993. Available under http://asrs.arc.nasa.gov/publications/directline/dl4_sterile.htm.

means, however, that there is no harmonised implementation. The safety risk would thus remain as described in Section 2.

Option 1, to encourage air operators to establish procedures, as needed, is expected to reduce the safety risk only a bit. Even today, with no specific regulatory framework in place, most operators have already established detailed operating procedures and best practices. To encourage operators could mean that they examine and, if deemed appropriate, revise their procedures. It is not expected that such an exercise would lead to a major reduction of the safety risk when compared to Option 0. The issue of non-harmonised implementation remains.

Option 2 proposes to include the following elements in the air operations regulatory framework:

a. The concept of a sterile flight deck;

b. The taxi phase of aeroplanes as a safety-critical activity; and

c. Procedures for taxiing to enhance runway safety.

Compared to Options 0 and 1, this option would lead to a major reduction of the safety risk.

Finally, Option 3 proposes to include the same elements in the air operations regulatory framework as Option 2 concerning the listed Items (a) and (c). The only difference between Option 2 and Option 3 is Item (b). In Option 3 the taxi phase of aeroplanes is not only a safety-critical activity, but even more, it is defined as a critical phase of flight. This would have consequences for cabin crew activities: If Option 3 is chosen and, consequently, taxiing becomes a critical phase of flight, then cabin crew during taxiing "shall be seated at the assigned stations" (see e.g. CAT.OP.MPA.210(b) of Part-CAT[42]). At first sight one could assume that such a measure would further decrease the safety risk to a measurable extent. In practice, however, it is extremely improbable that an occurrence during taxiing becomes hazardous or even catastrophic, because cabin crew was not seated at the assigned stations. Therefore, it can be concluded that defining taxiing as a critical phase of flight (Option 3) instead of treating the taxi phase as a safety-critical activity (Option 2) only leads to a further slight reduction of the safety risk. In addition, it can be questioned whether it is a reasonable approach in daily practice to require cabin crew to be seated during the taxi phase.

As mentioned in the Explanatory Note of the present NPA, the requirement that cabin crew "shall be seated at the assigned stations", could in principle be amended during the present rulemaking activity. One possibility could be to allow the cabin crew to leave their seats in order to perform safety-related duties. It can be concluded that the safety risk of such an option would be between the safety risk of Option 2 and Option 3. Therefore, such an option would be more practicable concerning cabin crew activities, but it would not reduce the safety risk to a measurable extent compared to Option 2.

5.2 Environmental impact

No environmental impacts are expected for any of the options.

5.3 Social impact

No social impacts are expected for any of the options.

5.4 Economic impact

No economic impacts are expected for Option 0.

[42] CAT.OP.MPA.210(b) 'Cabin crew members' of Annex IV (Part-CAT) of Opinion 04/2011 states: "During critical phases of flight, each cabin crew member shall be seated at the assigned station and shall not perform any activities other than those required for the safe operation of the aircraft".

Option 1 is to encourage air operators to establish procedures, as needed. Since operators in the normal case have already detailed procedures in place, it could mean that they examine and, only if appropriate, revise their procedures. This implies some costs. Providing training related to eventually revised procedures would lead to additional costs.

Concerning Option 2, it is expected that the economic impact in most cases is higher than the costs for Option 1. The reason is as follows: If the European regulatory framework is amended, it is expected that the operators have to revise their procedures and train their personnel in any case. However, no significant impact on operations, including turn-around times, is expected.

Finally, concerning Option 3, it is expected that the negative economic impact would be much higher than the costs envisaged for Option 2. The reason is as follows:

- Concerning the amendment of the regulatory framework, the same costs as for Option 2 are expected.
- In addition, if taxiing is defined as a critical phase of flight and, consequently, cabin crew needs to be seated during taxiing (for explanation see above) many procedures within the cabin would have to be carried out before push-back of the aircraft. This would increase the turn-around times at airports and, therefore, would lead to significantly higher costs for air operators and/or airports.

It is expected that none of the options induce a competitive disadvantage for the operators.

5.5 Proportionality issues

No proportionality issues are expected for any of the options.

5.6 Impact on regulatory coordination and harmonisation

As mentioned above, the ICAO Manual contains detailed information on best practices on the flight deck. The European Action Plan established recommendations and Guidance Material following the concept of the ICAO Manual. The FAA established the 'sterile cockpit rule' requiring flight crew members to refrain from non-essential activities during critical phases of flight, which includes taxiing[43].

Following Option 0 would mean that no harmonisation with the ICAO Manual, the European Action Plan and the FAA Regulation would be achieved. The same holds for Option 1.

Option 2 would mean no deviation from the ICAO Manual and the European Action Plan, but no full harmonisation with the FAA Regulation.

Option 3 is the only option which does not deviate from the ICAO Manual and the European Action Plan, and ensures harmonisation with the FAA Regulation as far as possible.

6 Conclusion and preferred option

As outlined in Section 5 of this RIA safety, economic and harmonisation impacts are to be expected when considering the different options. Therefore, only these possible impacts will be further considered in this conclusive section.

The baseline option (Option 0) implies that the risks remain the same as outlined in Section 2 of this document. Although it also means that no additional costs are caused, the Agency is of the opinion that this option should not be considered any further.

Option 1 proposes to do without amending the regulatory framework, but to encourage air operators to check and, if needed, to revise their procedures. Since it is expected that the

[43] For a more detailed description of the content of the ICAO Manual, the European Action Plan and the FAA Regulation, see the explanatory note of this NPA.

reduction of the safety risk may not be addressed sufficiently, the Agency proposes not to consider this option any further.

Option 3 proposes to establish a regulatory framework to provide operational procedures for all critical phases of flight which includes taxiing. This option is considered, when compared to Options 0 and 1, to lead to a major reduction of the safety risk, is consistent with ICAO and European guidance, and is harmonised as far as possible with the FAA Regulation. However, compared to the other options, Option 3 would lead to significantly higher costs. In addition, as described in the Explanatory Note of the present NPA, Option 3 would be considered 'indirect rulemaking', which was not accepted by the majority of the corresponding Rulemaking Group[44].

Option 2 is similar to Option 3 except that taxiing is a safety-critical activity, but is not defined as a critical phase of flight. Compared to Option 3, the reduction of the safety risk is slightly lower, and Option 2 is not fully harmonised with the FAA Regulation. On the other hand, Option 2, when compared to Option 3, leads to substantially lower costs and avoids 'indirect rulemaking'. Therefore, when considering the different evaluating factors, **Option 2 is the preferred option**.

The table below summarises the comparison of the qualitative impacts.

[44] Option 3 would lead to restrictive consequences for cabin crew activities within the cabin. The present rulemaking activity, however, is headed 'Sterile flight deck procedures' and, therefore, activities within the cabin are not explicitly mentioned in the title.

Table 2: Comparison of qualitative impacts

Options	Impact type	Pros	Cons	Overall
Option 0:	Baseline option - no change			
	Safety	---	No reduction of safety risk	Not acceptable
	Economic	No additional costs	---	No additional costs
	Harmonisation	---	Not harmonised with ICAO Manual, European Action Plan, FAA rule	No harmonisation
Option 1:	No rulemaking - but encouraging operators			
	Safety	---	No major reduction of safety risk	Not convincing concerning the reduction of safety risk
	Economic	---	Some additional costs	Costs are reasonable
	Harmonisation	---	Not harmonised with ICAO Manual, European Action Plan, FAA rule	No harmonisation
Option 2:	Rulemaking - for all critical phases of flight, for taxiing of aeroplanes, and for flight below 10 000 feet, except cruise flight			
	Safety	Major reduction of safety risk	---	High reduction of safety risk when compared to Options 0 and 1
	Economic	---	Some additional costs	Costs are reasonable
	Harmonisation	No deviation from ICAO Manual and European Action Plan	Not fully harmonised with FAA rule	Harmonisation partly achieved
Option 3:	Rulemaking - for all critical phases of flight which includes taxiing, and for flight below 10 000 feet, except cruise flight			
	Safety	Compared to Option 2 slightly higher reduction of safety risk	---	Highest reduction of safety risk, slightly higher than Option 2
	Economic	---	Highest costs	Compared to the other options the costs are high
	Harmonisation	No deviation from ICAO Manual, European Action Plan, FAA rule	---	Harmonisation achieved as far as possible