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منظمة الطيران
المدني الدولي

国际民用
航空组织

Tel.: +1 514-954-8219 ext. 6699

Ref.: SP 59/5.1-14/91

15 December 2014

Subject: Proposal for the amendment of Annex 11
relating to fatigue management approaches and
consequential amendment to Annex 6, Part I

Action required: Comments to reach Montréal by
15 March 2015

Sir/Madam,

1. I have the honour to inform you that the Air Navigation Commission, at the tenth meeting of its 197th Session held on 12 November 2014, reviewed a proposal to amend Annex 11 — *Air Traffic Services* and a consequential amendment to Annex 6 — *Operation of Aircraft, Part I — International Commercial Air Transport — Aeroplanes*. This amendment proposal arose from Recommendation 6/4 – *Human performance* of the Twelfth Air Navigation Conference (AN-Conf/12) and the Secretariat, with the assistance of the Fatigue Risk Management System Task Force (FRMSTF). The Commission authorized the transmission of these proposals to Contracting States and appropriate international organizations for comments.

2. Background information on the aforementioned proposals to Annex 11 and Annex 6, Part I are contained in Attachment A. The proposed amendment to Annex 11 and the consequential amendment to Annex 6, Part I are contained in Attachments B and C, respectively. The rationale for the amendments have been provided in a text box immediately following each proposal. Attachment D presents a comparison of the draft contents of the revised version of the *FRMS Manual for Regulators* (Doc 9966) (to be renamed the *Manual for the Oversight of Fatigue Management Approaches*) and the draft contents of the proposed *Fatigue Management Implementation Guide for ATS Providers*. Attachment D is provided for information only and your comments are sought only in relation to amendments proposed in Attachments B and C.

3. In examining the proposed amendments, you should not feel obliged to comment on editorial aspects as such matters will be addressed by the Air Navigation Commission during its final review of the draft amendments.

4. May I request that any comments you may wish to make on the proposed amendments to Annex 11 and Annex 6, Part I be dispatched to reach me not later than 15 March 2015. The Air Navigation Commission has asked me to specifically indicate that comments received after the due date may not be considered by the Commission and the Council.

5. For your information, the proposed amendment to Annex 11 is envisaged to have an early effective date with an applicability date extended to November 2020. The proposed consequential amendment to Annex 6, Part I is envisaged for applicability on 10 November 2016. Any comments you may have thereon would be appreciated.

6. The subsequent work of the Air Navigation Commission and the Council would be greatly facilitated by specific statements on the acceptability or otherwise of the amendment proposals.

7. Please note that, for the review of your comments by the Air Navigation Commission and the Council, replies are normally classified as “agreement with or without comments”, “disagreement with or without comments”, or “no indication of position”. If in your reply the expressions “no objections” or “no comments” are used, they will be taken to mean “agreement without comment” and “no indication of position”, respectively. In order to facilitate proper classification of your response, a form has been included in Attachment E which may be completed and returned together with your comments, if any, on the proposals in Attachments B and C.

Accept, Sir/Madam, the assurances of my highest consideration.



Raymond Benjamin
Secretary General

Enclosures:

- A — Background
- B — Proposed amendment to Annex 11
- C — Proposed amendment to Annex 6, Part I
- D — Proposed outline for the *Manual for the Oversight of Fatigue Management Approaches* (revised Doc 9966) and the *Fatigue Management Implementation Guide for Air Traffic Service (ATS) providers* (English only)
- E — Response form

BACKGROUND

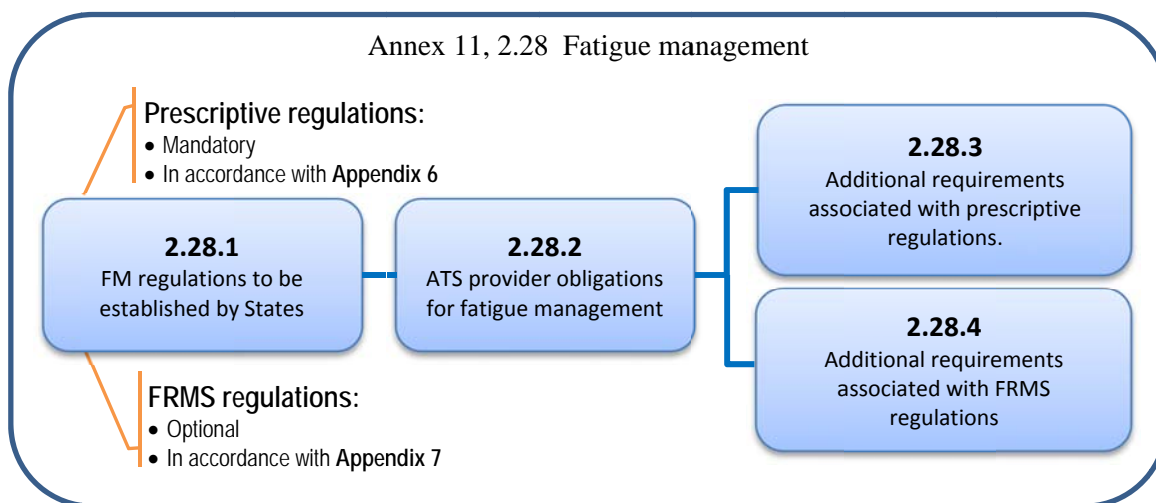
1.1 Fatigue is acknowledged as a hazard that predictably degrades various types of human performance and can contribute to aviation accidents or incidents. To address flight and cabin crew fatigue, Annex 6, Part I provides fatigue management Standards and Recommended Practices (SARPs). Currently, no corresponding fatigue management Standards exist for air traffic controllers. This is despite them having to perform safety-critical duties when they may be vulnerable to fatigue-related performance effects.

1.2 The proposed fatigue management section for Annex 11 — *Air Traffic Services* provide Standards that support two distinct methods for fatigue management: compliance with prescribed limits and the implementation of FRMS. The Standards propose the mandatory establishment of prescriptive duty limitation regulations for air traffic controllers (ATCOs) and the optional establishment of FRMS regulations. This approach aims to ensure that all States, regardless of context and availability of resources, have regulations that support minimum requirements for ATCO fatigue management while offering the potential safety and efficiency enhancements of FRMS. This is consistent with the approach taken in Annex 6, Part I.

1.3 It should be noted that in the development of these proposed Standards, ICAO's FRMS Task Force was expanded to include air traffic control service providers, air traffic controller representatives, regulators providing oversight of air traffic control services and scientists with particular experience in ATCO-centred fatigue management research. Far from being a “cut and paste” of the Annex 6, Part I SARPs, this proposal represents very careful consideration of the needs and the specificities of varying air traffic control contexts married with recent experience in the oversight and implementation of fatigue management approaches for air traffic controllers.

1.4 As these Standards relate specifically to air traffic controllers, care has been taken to use the term “air traffic service provider” to refer to the particular functional component of an air navigation service provider directly responsible for complying with the associated State regulations.

1.5 The fatigue management section proposed for Annex 11 (presented in Appendix B) consists of four Standards. This can be summarized in a diagram as follows:



1.6 Two guidance manuals are currently being developed to support these proposed SARPs. An extensive revision of the *Fatigue Risk Management Systems Manual for Regulators* (Doc 9966), developed in 2011 to support Annex 6, Part I FRMS SARPs for flight and cabin crew, will provide information on the development of fatigue management regulations and the oversight of fatigue management approaches for air traffic controllers. Also to be included will be guidance on the development of prescriptive fatigue management regulations adapted from the guidance currently provided in Attachment A of Annex 6, Part I. The revised title of Doc 9966 will be the *Manual for the Oversight of Fatigue Management Approaches* in order to reflect the expansion of topics. This change in title results in consequential amendments to Annex 6, Part I.

1.7 The revision of Doc 9966 is being accomplished by the FRMS Task Force in tandem with the development of the *Fatigue Management Implementation Guide for ATS Providers*. These manuals are intended to be complementary, with the *FRMS Manual for Regulators* (Doc 9966) containing more generic information about the development of fatigue management regulations and the oversight of fatigue management approaches (regardless of the aviation discipline in question) and the *Guide for ATS Provider* containing ATCO-specific information and research, and examples of implementation in ATCO contexts.

1.8 It is recognized that State-specific regulation to meet these Standards may take some years. To support the development of a well-planned regulatory response, the availability of the comprehensive guidance material identified above is planned to either pre-empt or coincide with an early effective date of any adopted SARPs. A prolonged period leading up to applicability in November 2020 is proposed in order to allow all States adequate time to establish the necessary regulations.

1.9 Mandatory implementation of the prescriptive fatigue management regulations may represent significant financial costs to both States and Industry. Current indications made available to ICAO suggest that these costs are justified by the benefits. As the development of FRMS regulations is optional, it is expected that these Standards will only be implemented where States consider FRMS to be cost effective and they have the resources available.

ATTACHMENT B to State letter SP 59/5.1-14/91

PROPOSED AMENDMENT TO ANNEX 11

NOTES ON THE PRESENTATION OF THE AMENDMENT

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new text to replace existing text

**PROPOSED AMENDMENT TO
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AIR TRAFFIC SERVICES

**ANNEX 11
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

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CHAPTER 1. DEFINITIONS

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Air traffic controller schedule. A plan for allocating air traffic controller duty periods and non-duty periods over a period of time, otherwise referred to as a roster.

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Duty. Any task that an air traffic controller is required by the air traffic services provider to perform. These tasks include those performed during time-in-position, administrative work and training.

Duty period. A period which starts when an air traffic controller is required by an air traffic services provider to report for or to commence a duty and ends when that person is free from all duties.

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Fatigue. A physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/or workload (mental and/or physical activity) that can impair a person's alertness and ability to adequately perform safety-related operational duties.

Fatigue risk management system (FRMS). A data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.

...

Non-duty period. A continuous and defined period of time, subsequent to and/or prior to duty periods, during which the air traffic controller is free of all duties.

...

Time-in-position. The period of time when an air traffic controller is exercising the privileges of the air traffic controller's licence at an operational position.

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	Proposed definitions to be included in Annex 11 are for terms used within the fatigue management Standards.

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CHAPTER 2. GENERAL

Editorial note.— Insert new paragraph 2.28 as follows and renumber subsequent paragraphs accordingly.

2.28 Fatigue management

Note.— Guidance on the development and implementation of fatigue management regulations is contained in the Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

2.28.1 States shall establish regulations for the purpose of managing fatigue in the provision of air traffic control services. These regulations shall be based upon scientific principles and knowledge, with the aim of ensuring that air traffic controllers perform at an adequate level of alertness. To that aim, States shall establish:

- a) regulations that prescribe scheduling limits in accordance with Appendix 6; and
- b) where authorizing air traffic services providers to use a fatigue risk management system (FRMS) to manage fatigue, FRMS regulations in accordance with Appendix 7.

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	<p>Standard 2.28.1 presents the fatigue management regulations to be established by States. Consistent with Annex 6, Part I, all fatigue management regulations must be based on scientific principles and knowledge.</p> <p>Regulations for prescriptive duty limits are mandatory, as they are in Annex 6, Part I. Prescriptive duty limitation regulations are seen as a suitable “minimum fatigue management approach” within the resources of all States. They are also seen as a baseline from which an FRMS can be developed (where FRMS regulations are established), and to which an ATS provider can be made to return when an FRMS is found not acceptable to a State. The reader is directed to Appendix 6 of Annex 11 which details what the prescriptive regulations must address.</p> <p>The establishment of FRMS regulations is optional for States. If established, FRMS regulations must be in accordance with Appendix 7 of Annex 11.</p>

2.28.2 States shall require that the air traffic services provider, for the purposes of managing its fatigue-related safety risks, establish one of the following:

- a) air traffic controller schedules commensurate with the service(s) provided and in compliance with the prescriptive limitation regulations established by the State in accordance with 2.28.1 a); or

- b) an FRMS, in compliance with regulations established by the State in accordance with 2.28.1 b), for the provision of all air traffic control services; or
- c) an FRMS, in compliance with regulations established by the State in accordance with 2.28.1 b), for a defined part of its air traffic control services in conjunction with schedules in compliance with the prescriptive limitation regulations established by the State in accordance with 2.28.1 a) for the remainder of its air traffic control services.

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	<p>Standard 2.28.2 identifies the options the ATS provider has for the management of its fatigue-related safety risks, depending on whether their State offers FRMS regulations.</p> <p>Where the State has established regulations for FRMS, ATS providers have three options for managing their fatigue risks: a) they can comply with the prescriptive limitation regulations in all operations; b) they can choose to implement an FRMS for all operations; or c) they can implement an FRMS in parts of their operations and in other operations comply with the prescriptive limitation regulations. Therefore, this Standard offers the ATS provider the opportunity to decide which method of fatigue management is most appropriate for its specific types of operations.</p> <p>Where the State does not have FRMS regulations, ATS providers must comply with their State's prescriptive limitation regulations.</p>

2.28.3 Where the air traffic services provider complies with prescriptive limitation regulations in the provision of part or all of its air traffic control services in accordance with 2.28.2 a), the State:

- a) shall require evidence that the limitations are not exceeded and that non-duty period requirements are met;
- b) shall require that the air traffic services provider familiarize its personnel with the principles of fatigue management and its policies with regard to fatigue management;
- c) shall establish a process to allow variations from the prescriptive limitation regulations to address any additional risks associated with sudden, unforeseen operational circumstances; and
- d) may approve variations to these regulations using an established process in order to address strategic operational needs in exceptional circumstances, based on the air traffic services provider demonstrating that any associated risk is being managed to a level of safety equivalent to, or better than, that achieved through the prescriptive fatigue management regulations.

Note.— Complying with the prescriptive limitations regulations does not relieve the air traffic services provider of the responsibility to manage its risks, including fatigue-related risks, using its SMS in accordance with the provisions of Annex 19.

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	<p>Standard 2.28.3 lists additional requirements associated with prescriptive limitation regulations.</p> <p>2.28.3 a) ensures that compliance with the prescriptive limits is not just determined through examination of schedules, which are planned work periods, but also through examination of the periods of time actually worked by air traffic controllers.</p> <p>2.28.3 b) identifies basic fatigue-related training as mandatory for air traffic controllers, whether or not it is incorporated in the training elements of an ATS provider's SMS.</p> <p>2.28.3 c) recognizes the need for air traffic service providers to have some flexibility to make tactical decisions that may require going outside of the prescribed limits in order to meet both operational needs and address overall risk, such as needing to maintain adequate ATCO coverage to manage high traffic in association with unexpectedly severe weather conditions. This Standard requires the State to develop a clear process so that an air traffic service provider knows what is required to make immediate and appropriate changes to address such unexpected operational circumstances.</p> <p>Where a State allows exceptions to their prescribed ATCO duty limits, Standard 2.28.3 d) requires the State to identify the conditions under which an ATS may be allowed to vary from prescriptive limits without having to implement a full FRMS. The intent is to allow the option for planned minor extensions to prescribed limits where acceptable to the State while minimising "regulation through variations", and to avoid variations that meet operational imperatives in the absence of a risk assessment.</p> <p>The note is a reminder of current obligations for ATS providers to manage fatigue risks, where identified, using their existing SMS processes when complying with prescribed limits.</p>

2.28.4 Where an air traffic services provider implements an FRMS to manage fatigue-related safety risks in the provision of part or all of its air traffic control services in accordance with 2.28.2 b), the State shall:

- a) require the air traffic services provider to have processes to integrate FRMS functions with its other safety management functions; and
- b) approve an FRMS, according to a documented process, that provides a level of safety acceptable to the State.

Note.— Provisions on the protection of safety information, which support the continued availability of information required by an FRMS, are contained in Annex 19.

End of new text

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	<p>Standard 2.28.4 lists additional requirements associated with FRMS regulations.</p> <p>2.28.4 a) ensures information exchange between the FRMS and the SMS in order to maximize their combined effectiveness.</p> <p>2.28.4 b) clarifies the need for the State to have a transparent FRMS approval process that requires an ATS provider to demonstrate, as final evidence, effectively functioning FRMS processes. This Standard aims to prevent the approval of an FRMS based only on the provision of a documented plan or a desktop review of an FRMS manual.</p> <p>The note serves to highlight that the collection of safety information is essential in implementing an FRMS and needs to be accorded protection in accordance with existing provisions in Annex 19.</p>

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Editorial note.— Insert new Appendices 6 and 7 as follows:

APPENDIX 6. PRESCRIPTIVE FATIGUE MANAGEMENT REGULATIONS

Note.— Guidance on the development and implementation of prescriptive fatigue management regulations is contained in the Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

1. States shall establish prescriptive limitation regulations that take into account acute and cumulative fatigue, circadian factors and the type of work being undertaken. These regulations shall identify:

- a) the maximum:
 - i) number of hours in any duty period;
 - ii) number of consecutive work days;
 - iii) number of hours worked in a defined period; and
 - iv) time-in-position;
- b) the minimum:
 - i) duration of non-duty periods;
 - ii) number of non-duty days required in a defined period; and
 - iii) duration of breaks between periods of time-in-position in a duty period.

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	<p>Appendix 6 , paragraph 1 identifies those roster features for which the regulator must prescribe limits, ensuring that prescriptive limitation regulations address basic conditions that will impact on the air traffic controller's ability to maintain an adequate level of alertness throughout work periods occurring across a 24-h day.</p> <p>Limiting the maximum number of hours worked in any duty period allows provision of an adequate opportunity for sleep recovery to address transient fatigue. Limiting the number of consecutive work days and the number of hours worked in a defined period is a mechanism for providing adequate recovery from cumulative sleep loss. While it is recognized that time spent in-position may be associated with varying workloads, the intent of limiting time-in-position is to specifically address the difficulties of maintaining performance under high workload conditions. For operations where time-in-position is related to only moderate and low workloads, the State may choose to prescribe time-in-position limits for specified operations or may require the ATS provider to seek a variation to the prescribed limits.</p> <p>Identifying minimum non-duty periods ensures that duty hours cannot be consistently split across a defined period in such a way as to prevent unbroken periods of recovery sleep. Identifying a minimum number of non-duty days in a defined period provides further opportunity for recovery from cumulative sleep loss. Identifying minimum duration of breaks between periods of time-in-position aims to specifically address the need to recover from periods of high workload in order to maintain performance.</p>

2. States shall require that the air traffic services provider identifies a process for assigning unscheduled duties that allows air traffic controllers to avoid extended periods of being awake.

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	<p>To address broader aviation safety risks, ATCOs sometimes have to be available to undertake unscheduled safety-critical duties, regardless of whether or not they are on standby. This Standard aims to minimize the likelihood of such unscheduled duties being undertaken when the ATCO has not had the opportunity to sleep for a long period of time, resulting in a high sleep drive.</p>

3. The processes established by States in accordance with 2.28.3 c) and d) to allow variations from 1 a) and b) above shall include the provision of:

- a) the reason for the need to deviate;
- b) the extent of the deviation;
- c) the date and time of enactment of the deviation; and
- d) a safety case, outlining mitigations, to support the deviation.

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	This Standard identifies the minimum requirements of any request for variation to prescribed limits, when the ATS provider is not implementing an FRMS.

APPENDIX 7. FATIGUE RISK MANAGEMENT SYSTEM (FRMS) REQUIREMENTS

Note.— Guidance on the development and implementation of FRMS regulations is contained in the Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

States shall require that an FRMS contain, at a minimum:

1. FRMS policy and documentation

1.1 FRMS policy

1.1.1 The air traffic services provider shall define its FRMS policy, with all elements of the FRMS clearly identified.

1.1.2 The policy shall:

- a) define the scope of FRMS operations;
- b) reflect the shared responsibility of management, air traffic controllers, and other involved personnel;
- c) clearly state the safety objectives of the FRMS;
- d) be signed by the accountable executive of the organization;
- e) be communicated, with visible endorsement, to all the relevant areas and levels of the organization;
- f) declare management commitment to effective safety reporting;
- g) declare management commitment to the provision of adequate resources for the FRMS;
- h) declare management commitment to continuous improvement of the FRMS;
- i) require that clear lines of accountability for management, air traffic controllers, and all other involved personnel are identified; and
- j) require periodic reviews to ensure it remains relevant and appropriate.

Note.— Effective safety reporting is described in the Safety Management Manual (SMM) (Doc 9859).

1.2 FRMS documentation

An air traffic services provider shall develop and keep current FRMS documentation that describes and records:

- a) FRMS policy and objectives;
- b) FRMS processes and procedures;
- c) accountabilities, responsibilities and authorities for these processes and procedures;
- d) mechanisms for ongoing involvement of management, air traffic controllers, and all other involved personnel;
- e) FRMS training programmes, training requirements and attendance records;
- f) scheduled and actual duty and non-duty periods and break periods between times in position in a duty period with significant deviations and reasons for deviations noted; and

Note.— Significant deviations are described in the Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

- g) FRMS outputs including findings from collected data, recommendations, and actions taken.

2. Fatigue risk management processes

2.1 Identification of fatigue-related hazards

Note.— Provisions on the protection of safety information are contained in Annex 19.

An air traffic services provider shall develop and maintain three fundamental and documented processes for fatigue hazard identification:

2.1.1 *Predictive.* The predictive process shall identify fatigue hazards by examining air traffic controller scheduling and taking into account factors known to affect sleep and fatigue and their effects on performance. Methods of examination may include but are not limited to:

- a) air traffic services or industry operational experience and data collected on similar types of operations or from other industries with shift work or 24-hour operations;
- b) evidence-based scheduling practices; and
- c) bio-mathematical models.

2.1.2 *Proactive.* The proactive process shall identify fatigue hazards within current air traffic services operations. Methods of examination may include but are not limited to:

- a) self-reporting of fatigue risks;
- b) fatigue surveys;
- c) relevant air traffic controller performance data;
- d) available safety databases and scientific studies;
- e) tracking and analysis of differences in planned and actual worked times; and
- f) observations during normal operations or special evaluations.

2.1.3 *Reactive.* The reactive process shall identify the contribution of fatigue hazards to reports and events associated with potential negative safety consequences in order to determine how the impact of fatigue could have been minimized. At a minimum, the process may be triggered by any of the following:

- a) fatigue reports;
- b) confidential reports;
- c) audit reports; and
- d) incidents.

2.2 Fatigue-related risk assessment

2.2.1 An air traffic services provider shall develop and implement risk assessment procedures that determine when the associated risks require mitigation.

2.2.2 The risk assessment procedures shall review identified fatigue hazards and link them to:

- a) operational processes;
- b) their probability;
- c) possible consequences; and
- d) the effectiveness of existing preventive controls and recovery measures.

2.3 Risk mitigation

An air traffic services provider shall develop and implement fatigue risk mitigation procedures that:

- a) select the appropriate mitigation strategies;
- b) implement the mitigation strategies; and

- c) monitor the strategies' implementation and effectiveness.

3. FRMS safety assurance processes

The air traffic services provider shall develop and maintain FRMS safety assurance processes to:

- a) provide for continuous FRMS performance monitoring, analysis of trends, and measurement to validate the effectiveness of the fatigue safety risk controls. The sources of data may include, but are not limited to:
 - 1) hazard reporting and investigations;
 - 2) audits and surveys; and
 - 3) reviews and fatigue studies (both internal and external);
- b) provide a formal process for the management of change. This shall include but is not limited to:
 - 1) identification of changes in the operational environment that may affect the FRMS;
 - 2) identification of changes within the organization that may affect the FRMS; and
 - 3) consideration of available tools which could be used to maintain or improve FRMS performance prior to implementing changes; and
- c) provide for the continuous improvement of the FRMS. This shall include but is not limited to:
 - 1) the elimination and/or modification of preventive controls and recovery measures that have had unintended consequences or that are no longer needed due to changes in the operational or organizational environment;
 - 2) routine evaluations of facilities, equipment, documentation and procedures; and
 - 3) the determination of the need to introduce new processes and procedures to mitigate emerging fatigue-related risks.

4. FRMS promotion processes

FRMS promotion processes support the ongoing development of the FRMS, the continuous improvement of its overall performance, and attainment of optimum safety levels. The following shall be established and implemented by the air traffic service provider as part of its FRMS:

- a) training programmes to ensure competency commensurate with the roles and responsibilities of management, air traffic controllers, and all other involved personnel under the planned FRMS; and

b) an effective FRMS communication plan that:

- 1) explains FRMS policies, procedures and responsibilities to all relevant stakeholders; and
- 2) describes communication channels used to gather and disseminate FRMS-related information.

End of new text

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	The proposed Appendix 7 for Annex 11 outlines the necessary components and minimum requirements of an FRMS. This Appendix reflects similar FRMS requirements in Appendix 8 of Annex 6, Part I.

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ATTACHMENT C to State letter SP 59/5.1-14/91

PROPOSED AMENDMENT TO ANNEX 6, PART I

NOTES ON THE PRESENTATION OF THE AMENDMENT

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**PROPOSED AMENDMENT TO
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

OPERATION OF AIRCRAFT

**ANNEX 6
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

**PART I
INTERNATIONAL COMMERCIAL AIR TRANSPORT —
AEROPLANES**

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CHAPTER 1. DEFINITIONS

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Fatigue. A physiological state of reduced mental or physical performance capability resulting from sleep loss or, extended wakefulness, circadian phase, and/or workload (mental and/or physical activity) that can impair a crew member's person's alertness and ability to safely operate an aircraft or adequately perform safety-related operational duties.

...

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	The proposed amendment generalizes the current definition of fatigue, which is specific to flight and cabin crew, to make it applicable for use in Annex 11 and to any other aviation discipline for which fatigue management provisions may need to be developed in the future.

CHAPTER 4. FLIGHT OPERATIONS

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4.10 Fatigue management

Note.— Guidance on the development and implementation of fatigue management regulations is contained in the Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

4.10.1 The State of the Operator shall establish regulations for the purpose of managing fatigue. These regulations shall be based upon scientific principles and knowledge, with the aim of ensuring that flight and cabin crew members are performing at an adequate level of alertness. Accordingly, the State of the Operator shall establish:

...

~~*Note.— Guidance for the development of prescriptive regulations to manage fatigue is given in Attachment A and detailed requirements for an FRMS are in Appendix 7.*~~

4.10.2 The State of the Operator shall require that the operator, in compliance with 4.10.1 and for the purposes of managing its fatigue-related safety risks, establish either:

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Note.—~~Guidance for the implementation and oversight of an FRMS is given in the Fatigue Risk Management Systems Manual for Regulators (Doc 9966).~~

...

4.10.7 **Recommendation.**— *States should require that, where an operator has an FRMS, it is integrated with the operator's SMS.*

Note.— The integration of FRMS and SMS is described in the ~~Fatigue Risk Management Systems Manual for Regulators~~ Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

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APPENDIX 7. FATIGUE RISK MANAGEMENT SYSTEM REQUIREMENTS

Note.— Guidance on the development, ~~and implementation, approval and monitoring of an FRMS regulations~~ is contained in the ~~Fatigue Risk Management Systems Manual for Regulators~~ Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

...

1.2 FRMS documentation

...

f) scheduled and actual flight times, duty periods and rest periods with significant deviations and reasons for deviations noted; and

Note.— Significant deviations are described in the ~~Fatigue Risk Management Systems Manual for Regulators~~ Manual for the Oversight of Fatigue Management Approaches (Doc 9966).

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Editorial note.— Delete Attachment A in toto and renumber subsequent attachments accordingly.

~~ATTACHMENT A. GUIDANCE MATERIAL FOR DEVELOPMENT OF PRESCRIPTIVE FATIGUE MANAGEMENT REGULATIONS~~

Supplementary to Chapter 4, 4.10.1 and 4.10.2 a)

<i>Origin</i>	<i>Rationale</i>
Secretariat and the Fatigue Risk Management Systems Task Force (FRMSTF)	<p>These proposed amendments relate to a change of title with the revision of the supporting guidance material – <i>The FRMS Manual for Regulators</i> (Doc. 9966). The revised Doc 9966 will:</p> <ul style="list-style-type: none"> a) include guidance on the development and oversight of prescriptive limitation regulations relocated and adapted from Attachment A (Guidance Material for Development of Prescriptive Fatigue Management Regulations) of Annex 6, Part I;

	<ul style="list-style-type: none">b) update current guidance related to implementation of FRMS in airlines based on recent experience; andc) provide information on the regulation and oversight of fatigue management approaches for air traffic controllers. <p>The revised title of Doc 9966 will be the <i>Manual for the Oversight of Fatigue Management Approaches</i> in order to reflect the expansion of topics.</p>
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PROPOSED OUTLINE FOR THE
MANUAL FOR THE OVERSIGHT OF FATIGUE MANAGEMENT
APPROACHES (REVISED DOC 9966)
AND THE
FATIGUE MANAGEMENT IMPLEMENTATION GUIDE FOR AIR
TRAFFIC SERVICES (ATS) PROVIDERS

The following pages present a comparison between a draft Table of Contents for the revised version of the *FRMS Manual for Regulators* (Doc 9966) (to be renamed *The Manual for the Oversight of Fatigue Management Approaches*) and a draft Table of Contents for the proposed *Fatigue Management Implementation Guide for Air Traffic Services (ATS) Providers*. The aim is to show how information is planned to be distributed across these complementary manuals and to highlight their relationship. Together, these manuals will provide comprehensive guidance to support the proposed Annex 11 fatigue management Standards.

Ch	Manual for the Oversight of Fatigue Management Approaches (Revised Doc 9966)	Fatigue Management Implementation Guide for Air Traffic Services Providers
1	<p>Why fatigue is an issue for aviation</p> <p>Fatigue management approaches</p> <ul style="list-style-type: none"> • Prescriptive • FRMS • Table comparing FM approaches <p>Fatigue management SARPs and their intent</p> <ul style="list-style-type: none"> ○ Annex 6, Part I ○ Annex 6, Part II ○ Annex 11 	<p>Why fatigue is an issue for ATCOs</p> <p>Fatigue management approaches</p> <ul style="list-style-type: none"> • Prescriptive • FRMS • Table comparing FM approaches <p>Annex 11 Fatigue management SARPs and their intent</p>
2	<p>Scientific principles</p> <ul style="list-style-type: none"> • Sleep need and recovery • Extended periods of wakefulness • Circadian influences • Workload <p>Operational implications</p> <ul style="list-style-type: none"> • Scheduling (Generic) • Mitigations (Generic) 	<p>Scientific principles</p> <ul style="list-style-type: none"> • Sleep need and recovery • Extended periods of wakefulness • Circadian influences • Workload <p>Operational implications</p> <ul style="list-style-type: none"> • Scheduling (ATCO-specific) • Mitigations (ATCO-specific)
3	<p>Operational knowledge and experience</p> <ul style="list-style-type: none"> • Operational context • Organizational context • Stakeholder responsibilities (regulator, service provider and individual professional) 	<p>ATC operational knowledge and experience</p> <ul style="list-style-type: none"> • Operational context • Organizational context • Stakeholder responsibilities (regulator, ATS provider and ATCOs)
4	<p>Prescriptive approach</p> <ul style="list-style-type: none"> • Developing prescriptive regulations 	<p>Prescriptive approach</p> <ul style="list-style-type: none"> • Managing fatigue risk through SMS processes –

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	<ul style="list-style-type: none"> ○ Identifying limits in different operational contexts ○ Identifying a process for variations to limits in unforeseen operational circumstances ● Oversight <ul style="list-style-type: none"> ○ Compliance with prescriptive limits ○ Are rosters developed with FM principles in mind? ○ Assessing “Call-in” procedures and issues related to standby ○ Examine risk register for consideration of fatigue ○ Examine reporting behaviour ○ Any mitigations implemented are monitored for effectiveness ○ Training appropriate to the operation ● Approving variations – process and methodology for assessing the safety case for variations 	<ul style="list-style-type: none"> ○ Responsibilities – regulator, operator, individual ○ Monitoring fatigue as another risk <ul style="list-style-type: none"> ▪ fatigue as a component in safety reports ○ Developing schedules within regulated limits ○ Implementation and evaluation of mitigations (examples) ○ Training ● Maintaining records of scheduled duties and actual working times ● Establishing a process for “call-ins” and assigning unscheduled duties. ● Developing a safety case for variation requests ● Managing additional risks in unforeseen circumstances
5	<p data-bbox="241 899 453 932">FRMS approach</p> <ul style="list-style-type: none"> ● Deciding to offer FRMS regulations ● The need for an effective safety reporting system ● Responsibilities – regulator, service provider, individual ● Relationship with SMS ● FRMS framework ● Approval process <ul style="list-style-type: none"> ○ Phased approach ○ SPIs for making the final decision to approve <ul style="list-style-type: none"> ▪ Assessing risk assessments ● Oversight <ul style="list-style-type: none"> ○ Monitoring fatigue safety performance indicators ○ Assessing information sharing between SMS and FRMS ○ Assessing change management 	<p data-bbox="1068 899 1281 932">FRMS approach</p> <ul style="list-style-type: none"> ● Deciding to implement an FRMS ● How to foster an effective safety reporting system ● Responsibilities – regulator, ATS provider, ATC ● FRMS framework ● Implementation process and ATS provider examples ● Transitioning ATCs from services under prescriptive limits to services under FRMS

Ch	Manual for the Oversight of Fatigue Management Approaches (Revised Doc 9966)	Fatigue Management Implementation Guide for Air Traffic Services Providers
	<ul style="list-style-type: none">○ Assessing continuous improvement processes○ Desk-top, on-site audits and unscheduled visits○ Requirements for alternating staff between operations compliant with prescriptive limits and FRMS operations	
	Appendices: <ul style="list-style-type: none">● Tools for measuring fatigue● FM SPIs and flowchart examples● Procedures for napping during duty periods	Appendices: <ul style="list-style-type: none">● Tools for measuring fatigue● FM SPIs and flowchart examples● Procedures for napping during duty periods

ATTACHMENT E to State letter SP 59/5.1-14/91

**RESPONSE FORM TO BE COMPLETED AND RETURNED TO ICAO TOGETHER
WITH ANY COMMENTS YOU MAY HAVE ON THE PROPOSED AMENDMENTS**

To: The Secretary General
International Civil Aviation Organization
999 University Street
Montréal, Quebec
Canada, H3C 5H7

(State) _____

Please make a checkmark (✓) against one option for each amendment. If you choose options “agreement with comments” or “disagreement with comments”, **please provide your comments on separate sheets.**

	<i>Agreement without comments</i>	<i>Agreement with comments*</i>	<i>Disagreement without comments</i>	<i>Disagreement with comments</i>	<i>No position</i>
Amendment to Annex 11 — <i>Air Traffic Services</i> (Attachment B refers)					
Amendment to Annex 6 — <i>Operation of Aircraft</i> , Part I — <i>International Commercial Air Transport</i> — <i>Aeroplanes</i> (Attachment C refers)					

*“Agreement with comments” indicates that your State or organization agrees with the intent and overall thrust of the amendment proposal; the comments themselves may include, as necessary, your reservations concerning certain parts of the proposal and/or offer an alternative proposal in this regard.

Signature: _____ Date: _____

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