



International
Civil Aviation
Organization

Organisation
de l'aviation civile
internationale

Organización
de Aviación Civil
Internacional

Международная
организация
гражданской
авиации

منظمة الطيران
المدني الدولي

国际民用
航空组织

Tel.: +1 514-954-8219 ext. 6710

Ref.: AN 13/13.1-16/39

11 April 2016

Subject: Adoption of Amendment 50 to Annex 11

Action required: a) Notify any disapproval before 11 July 2016; b) Notify any differences and compliance before 10 October 2016 and 5 October 2020; and c) Consider the use of the Electronic Filing of Differences (EFOD) System for notification of differences and compliance

Sir/Madam,

1. I have the honour to inform you that Amendment 50 to the *International Standards and Recommended Practices, Air Traffic Services* (Annex 11 to the Convention on International Civil Aviation) was adopted by the Council at the fourth meeting of its 207th Session on 22 February 2016. Copies of the Amendment and the Resolution of Adoption are available as attachments to the electronic version of this State letter on the ICAO-NET (<http://portal.icao.int>) where you can access all other relevant documentation.

2. When adopting the amendment, the Council prescribed 11 July 2016 as the date on which it will become effective, except for any part concerning which a majority of Contracting States have registered their disapproval before that date. In addition, the Council resolved that Amendment 50, to the extent it becomes effective, will become applicable on 10 November 2016¹.

3. Amendment 50 arises from:

a) the second meeting of the Operational Data Link Panel (OPLINKP/2);

¹ 5 November 2020 for Amendment 50-B

- b) the twelfth meeting of the Instrument Flight Procedures Panel (IFPP/12);
- c) Recommendation 5/1 — Amendment 77 to Annex 3/Technical Regulations [C. 3.1] and consequential amendments to Annex 11, PANS-ABC and PANS-ATM, *Meteorology (MET) Divisional Meeting (2014)* (Doc 10045); and
- d) Recommendation 6/4 — Human performance, of the *Twelfth Air Navigation Conference (AN-Conf/12)* (Doc 10007) and the Secretariat, with the assistance of the Fatigue Risk Management System Task Force (FRMSTF).

4. The amendment concerning performance-based communication and surveillance (PBCS) is to revise the existing provision regarding required communication performance (RCP) to performance-based communication (PBC) and to add a new provision for surveillance equipment and performance-based surveillance (PBS). The proposal also includes a requirement for establishment of a PBCS monitoring programme when RCP and RSP specifications are prescribed.

5. The amendment concerning procedure design and oversight Standards and Recommended Practices (SARPs) addresses the requirements for the regulatory framework on instrument flight procedure design service and definition of the responsibilities of Contracting States on the provision of safe flight procedures. This amendment will improve flight safety through consistent implementation of instrument flight procedure design services and oversight of the services by States.

6. The amendment concerning aeronautical meteorology is a consequential amendment resulted from Amendment 77 to Annex 3 to update the definition of SIGMET in Annex 11.

7. The amendment concerning fatigue management for air traffic controllers offers minimum Standards for the management of air traffic controller fatigue risks through both compliance with prescriptive limits and the implementation of a Fatigue Risk Management System (FRMS).

8. The subjects are given in the amendment to the Foreword of Annex 11, a copy of which is in Attachment A.

9. In conformity with the Resolution of Adoption, may I request:

- a) that before 11 July 2016 you inform me if there is any part of the adopted Standards and Recommended Practices (SARPs) amendments in Amendment 50 (i.e., Amendments 50-A and 50-B) concerning which your Government wishes to register disapproval, using the form in Attachment B for this purpose. Please note that only statements of disapproval need be registered and if you do not reply it will be assumed that you do not disapprove of the amendment;
- b) that before 10 October 2016² you inform me of the following, using the Electronic Filing of Differences (EFOD) System or the form in Attachment C for this purpose:

² 5 October 2020 for Amendment 50-B

- 1) any differences that will exist on 10 November 2016³ between the national regulations or practices of your Government and the provisions of the whole of Annex 11, as amended by all amendments up to and including Amendment 50, and thereafter of any further differences that may arise; and
- 2) the date or dates by which your Government will have complied with the provisions of the whole of Annex 11, as amended by all amendments up to and including Amendment 50.

10. With reference to the request in paragraph 9 a) above, it should be noted that a registration of disapproval of Amendment 50 or any part of it in accordance with Article 90 of the Convention does not constitute a notification of differences under Article 38 of the Convention. To comply with the latter provision, a separate statement is necessary if any differences do exist, as requested in paragraph 9 b) 1). It is recalled in this respect that international Standards in Annexes have a conditional binding force, to the extent that the State or States concerned have not notified any difference thereto under Article 38 of the Convention.

11. With reference to the request in paragraph 9 b) above, it should be also noted that the ICAO Assembly, at its 38th Session (24 September to 4 October 2013), resolved that Member States should be encouraged to use the EFOD System when notifying differences (Resolution A38-11 refers). The EFOD System is currently available on the Universal Safety Oversight Audit Programme (USOAP) restricted website (<http://www.icao.int/usoap>) which is accessible by all Member States. You are invited to consider using this for notification of compliance and differences.

12. Guidance on the determination and reporting of differences is given in the Note on the Notification of Differences in Attachment D. Please note that a detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.

13. I would appreciate it if you would also send a copy of your notifications, referred to in paragraph 9 b) above, to the ICAO Regional Office accredited to your Government.

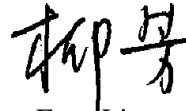
14. At the fifth meeting of its 204th Session, the Council requested that States, when being advised of the adoption of an Annex amendment, be provided with information on implementation and available guidance material, as well as an impact assessment. This is presented for your information in Attachments E and F, respectively.

15. As soon as practicable after the amendment becomes effective, on 11 July 2016, replacement pages incorporating Amendment 50 (i.e., Amendments 50-A and 50-B) will be forwarded to you.

³ 5 November 2020 for Amendment 50-B

16. Please note that Amendment 50-B concerning the fatigue management for air traffic controllers has an applicability date of 5 November 2020. It should be noted that the time between the effective date and the applicability date is longer than usual due to the nature and complexity of the proposal and to allow States the time necessary to develop scientifically based fatigue management regulations suited to their context.

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



Fang Liu
Secretary General

Enclosures:

- A — Amendment to the Foreword of Annex 11
- B — Form on notification of disapproval of all or part of Amendment 50 to Annex 11
- C — Form on notification of compliance with or differences from Annex 11, Amendment 50
- D — Note on the Notification of Differences
- E — Implementation task list and outline of guidance material in relation to Amendment 50 to Annex 11
- F — Impact assessment in relation to Amendment 50 to Annex 11

ATTACHMENT A to State letter AN 13/13.1-16/39

AMENDMENT TO THE FOREWORD OF ANNEX 11

Add the following at the end of Table A:

<i>Amendment</i>	<i>Source(s)</i>	<i>Subjects</i>	<i>Adopted/Approved Effective Applicable</i>
50-A	The second meeting of the Operational Data Link Panel (OPLINKP/2); the twelfth meeting of the Instrument Flight Procedures Panel (IFPP/12); and the Meteorology (MET) Divisional Meeting (2014) (Recommendation 5/1 refers)	Provisions concerning performance-based communication and surveillance (PBCS); regulatory framework on instrument flight procedure design service; and consequential amendment concerning aeronautical meteorology	22 February 2016 11 July 2016 10 November 2016

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject</i>	<i>Adopted/Approved Effective Applicable</i>
50-B	The Twelfth Air Navigation Conference (AN-Conf/12, Recommendation 6/4) and the Secretariat, with the assistance of the Fatigue Risk Management System Task Force (FRMSTF)	Provisions concerning fatigue management for air traffic controllers	22 February 2016 11 July 2016 5 November 2020

ATTACHMENT B to State letter AN 13/13.1-16/39

NOTIFICATION OF DISAPPROVAL OF ALL OR PART OF
AMENDMENT 50 TO ANNEX 11

To: The Secretary General
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montreal, Quebec
Canada H3C 5H7

(State) _____ hereby wishes to disapprove the following parts of
Amendment 50 to Annex 11:

Signature _____

Date _____

NOTES

- 1) If you wish to disapprove all or part of Amendment 50 (i.e. 50-A and 50-B) to Annex 11, please dispatch this notification of disapproval to reach ICAO Headquarters by 11 July 2016. If it has not been received by that date it will be assumed that you do not disapprove of the amendment. **If you approve of all parts of Amendment 50, it is not necessary to return this notification of disapproval.**
- 2) This notification should not be considered a notification of compliance with or differences from Annex 11. Separate notifications on this are necessary. (See Attachment C.)
- 3) Please use extra sheets as required.

ATTACHMENT C to State letter AN 13/13.1-16/39

NOTIFICATION OF COMPLIANCE WITH OR DIFFERENCES FROM ANNEX 11

(including all amendments up to and including Amendment 50)

To: The Secretary General
International Civil Aviation Organization
999 Robert-Bourassa Boulevard
Montreal, Quebec
Canada H3C 5H7

1. No differences will exist on _____ between the national regulations and/or practices of **(State)** _____ and the provisions of Annex 11, including all amendments up to and including Amendment 50 (i.e. 50-A and 50-B).

2. The following differences will exist on _____ between the regulations and/or practices of **(State)** _____ and the provisions of Annex 11, including Amendment 50 (i.e. 50-A and 50-B) (Please see Note 2) below.)

a) Annex Provision (Please give exact paragraph reference)	b) Details of Difference (Please describe the difference clearly and concisely)	c) Remarks (Please indicate reasons for the difference)
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(Please use extra sheets as required)

3. By the dates indicated below, **(State)** _____ will have complied with the provisions of Annex 11, including all amendments up to and including Amendment 50 (i.e. 50-A and 50-B) for which differences have been notified in 2 above.

a) Annex Provision (Please give exact paragraph reference)	b) Date	c) Comments
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(Please use extra sheets as required)

Signature _____

Date _____

NOTES

- 1) If paragraph 1 above is applicable to your State, please complete paragraph 1 and return this form to ICAO Headquarters. If paragraph 2 is applicable to you, please complete paragraphs 2 and 3 and return the form to ICAO Headquarters.
- 2) A detailed repetition of previously notified differences, if they continue to apply, may be avoided by stating the current validity of such differences.
- 3) Guidance on the notification of differences is provided in the Note on the Notification of Differences and in the *Manual on Notification and Publication of Differences* (Doc 10055).
- 4) Please send a copy of this notification to the ICAO Regional Office accredited to your Government.

ATTACHMENT D to State letter AN 13/13.1-16/39

NOTE ON THE NOTIFICATION OF DIFFERENCES
(Prepared and issued in accordance with instructions of the Council)

1. *Introduction*

1.1 Article 38 of the *Convention on International Civil Aviation* (“Convention”) requires that a Contracting State notify ICAO any time it does not comply with a Standard in all respects, it does not bring its regulations or practices into full accord with any Standard, or it adopts regulations or practices differing in any particular respect from the Standard.

1.2 The Assembly and the Council, when reviewing the notification of differences by Contracting States in compliance with Article 38 of the Convention, have repeatedly noted that the timeliness and currency of such notifications is not entirely satisfactory. Therefore, this note is issued to reiterate the primary purpose of Article 38 of the Convention and to facilitate the determination and notification of differences.

1.3 The primary purpose of the notification of differences is to promote safety, regularity and efficiency in air navigation by ensuring that governmental and other agencies, including operators and service providers, concerned with international civil aviation are made aware of all national regulations and practices in so far as they differ from those prescribed in the Standards contained in Annexes to the Convention.

1.4 Contracting States are, therefore, requested to give particular attention to the notification of differences with respect to Standards in all Annexes, as described in paragraph 4 b) 1) of the Resolution of Adoption.

1.5 Although differences from Recommended Practices are not notifiable under Article 38 of the Convention, the Assembly has urged Contracting States to extend the above considerations to Recommended Practices contained in Annexes to the Convention, as well.

2. *Notification of differences from Standards and Recommended Practices (SARPs)*

2.1 Guidance to Contracting States in the notification of differences to Standards and Recommended Practices (SARPs) can only be given in very general terms. Contracting States are further reminded that compliance with SARPs generally extends beyond the issuance of national regulations and requires establishment of practical arrangements for implementation, such as the provision of facilities, personnel and equipment and effective enforcement mechanisms. Contracting States should take those elements into account when determining their compliance and differences. The following categories of differences are provided as a guide in determining whether a notifiable difference exists:

- a) ***A Contracting State’s requirement is more exacting or exceeds a SARP (Category A).*** This category applies when the national regulation and practices are more demanding than the corresponding SARP, or impose an obligation within the scope of the Annex which is not covered by the SARP. This is of particular importance where a Contracting State requires a higher standard which affects the operation of aircraft of other Contracting States in and above its territory;

- b) *A Contracting State's requirement is different in character or the Contracting State has established other means of compliance (Category B)**. This category applies, in particular, when the national regulation and practices are different in character from the corresponding SARP, or when the national regulation and practices differ in principle, type or system from the corresponding SARP, without necessarily imposing an additional obligation; and
- c) *A Contracting State's requirement is less protective, partially implemented or not implemented (Category C)*. This category applies when the national regulation and practices are less protective than the corresponding SARP; when no national regulation has been promulgated to address the corresponding SARP, in whole or in part; or when the Contracting State has not brought its practices into full accord with the corresponding SARP.

These categories do not apply to Not Applicable SARP. Please see the paragraph below.

2.2 **Not Applicable SARP.** When a Contracting State deems a SARP concerning aircraft, operations, equipment, personnel, or air navigation facilities or services to be not applicable to the existing aviation activities of the State, notification of a difference is not required. For example, a Contracting State that is not a State of Design or Manufacture and that does not have any national regulations on the subject, would not be required to notify differences from Annex 8 provisions related to the design and construction of an aircraft.

2.3 **Differences from appendices, tables and figures.** The material comprising a SARP includes not only the SARP itself, but also the appendices, tables and figures associated with the SARP. Therefore, differences from appendices, tables and figures are notifiable under Article 38. In order to file a difference against an appendix, table or figure, States should file a difference against the SARP that makes reference to the appendix, table or figure.

2.4 **Differences from definitions.** Contracting States should notify differences from definitions. The definition of a term used in a SARP does not have independent status but is an essential part of each SARP in which the term is used. Therefore, a difference from the definition of the term may result in there being a difference from any SARP in which the term is used. To this end, Contracting States should take into consideration differences from definitions when determining compliance or differences to SARPs in which the terms are used.

2.5 The notification of differences should be not only to the latest amendment but to the whole Annex, including the amendment. In other words, Contracting States that have already notified differences are requested to provide regular updates of the differences previously notified until the difference no longer exists.

2.6 Further guidance on the identification and notification of differences, examples of well-defined differences and examples of model processes and procedures for management of the notification of differences can be found in the *Manual on Notification and Publication of Differences* (Doc 10055).

* The expression "different in character or other means of compliance" in b) would be applied to a national regulation and practice which achieve, by other means, the same objective as that of the corresponding SARPs or for other substantive reasons so cannot be classified under a) or c).

3. *Form of notification of differences*

3.1 Differences can be notified:

- a) by sending to ICAO Headquarters a form on notification of compliance or differences; or
- b) through the Electronic Filing of Differences (EFOD) System at www.icao.int/usoap.

3.2 When notifying differences, the following information should be provided:

- a) the number of the paragraph or subparagraph which contains the SARP to which the difference relates*;
- b) the reasons why the State does not comply with the SARP, or considers it necessary to adopt different regulations or practices;
- c) a clear and concise description of the difference; and
- d) intentions for future compliance and any date by which your Government plans to confirm compliance with and remove its difference from the SARP for which the difference has been notified.

3.3 The differences notified will be made available to other Contracting States, normally in the terms used by the Contracting State when making the notification. In the interest of making the information as useful as possible, Contracting States are requested to ensure that:

- a) statements be as clear and concise as possible and be confined to essential points;
- b) the provision of extracts from national regulations not be considered as sufficient to satisfy the obligation to notify differences; and
- c) general comments, unclear acronyms and references be avoided.

* This applies only when the notification is made under 3.1 a).

**IMPLEMENTATION TASK LIST AND OUTLINE OF GUIDANCE
MATERIAL IN RELATION TO AMENDMENT 50 TO ANNEX 11**

1. IMPLEMENTATION TASK LIST

1.1 Essential steps to be followed by a State in order to implement the proposed amendment to Annex 11:

Amendments concerning performance-based communication and surveillance (PBCS)

- a) identification of the rule-making process necessary to transpose the amendments into the national requirements taking into consideration the applicability dates;
- b) identification and notification of differences, if applicable;
- c) drafting of the modification(s) to the national requirements and means of compliance;
- d) official adoption of the national requirements and/or means of compliance;
- e) modification of surveillance programmes to include new requirements, if applicable;
- f) revision of guidance material and checklists for inspectors;
- g) training of inspectors based on the revised inspector guidance material;
- h) identification of air navigation service providers who wish to implement ATM operations predicated on communication and surveillance performance;
- i) development of an implementation plan, including timelines, to confirm compliance for each applicable air operator; and
- j) operational acceptance of policy and procedures of ANSP(s) to comply with applicable requirements.

Amendments concerning procedure design and oversight SARPs

- a) identification of the rule-making process necessary to transpose the modified ICAO provisions into the national regulations;
- b) establishment of a national implementation plan that takes into account the modified ICAO provisions;
- c) drafting of the modification to the national regulations and means of compliance;

- d) official adoption of the national regulations and means of compliance;
- e) training of operational staff in the provision and use of new provisions; and
- f) filing of State differences with ICAO, if necessary.

Consequential amendment concerning aeronautical meteorology

- a) identification of the rule-making process necessary to transpose the modified ICAO provisions into the national regulations;
- b) establishment of a national implementation plan that takes into account the modified ICAO provisions;
- c) drafting of the modification to the national regulations and means of compliance;
- d) Official adoption of the national regulations and means of compliance; and
- e) filing of State differences with ICAO, if necessary.

Amendment concerning fatigue management for air traffic controllers

- a) ensure personnel involved in establishing prescriptive limitation regulations for air traffic controllers and their oversight have adequate knowledge of subject. Educate as necessary;
- b) establish prescriptive limitation regulations for air traffic controllers. Where there are pre-existing prescriptive limitation regulations for air traffic controllers, these should be reviewed in line with new SARPs. Industry consultation is strongly recommended;
- c) decide whether to establish FRMS regulations and develop associated processes and guidance as necessary. Further education of civil aviation safety inspectors may be necessary; and
- d) transition oversight of fatigue management for air traffic controllers into normal oversight programme.

2. STANDARDIZATION PROCESS

- 2.1 Effective date: 11 July 2016
- 2.2 Applicability date: 10 November 2016 (PBCS, procedure design and oversight SARPs and aeronautical meteorology).
- 2.3 Applicability date: 5 November 2020 (fatigue management for air traffic controllers).
- 2.4 Embedded applicability date(s): N/A

3. SUPPORTING DOCUMENTATION

3.1 ICAO documentation

Title	Type (PANS/TI/Manual/Circ)	Planned publication date
<i>Global Operational Data Link (GOLD) Manual</i> (Doc 10037)	Manual	November 2016
<i>Performance-based communication and surveillance (PBCS) Manual</i> (Doc 9869)	Manual	November 2016
<i>Procedures for Air Navigation Services — Aircraft Operations</i> (PANS-OPS, Doc 8168)	PANS	November 2016
<i>Manual on the Development of a Regulatory Framework for Instrument Flight Procedure Design Service</i> (Doc XXXX)	Manual	November 2016
<i>Manual for the Oversight of Fatigue Management Approaches</i> (Doc 9966)	Manual	March 2016 (unedited)

3.2 External documentation

Title	External Organization	Publication date
Fatigue Management Guide for Air Traffic Services Providers	ICAO/CANSO/IFATCA	March 2016

4. IMPLEMENTATION ASSISTANCE TASKS

Type	Global	Regional
Awareness		RASG, RSOOs, PIRGs, COSCAPs
Workshop/Seminar		Regional Offices
Broader distribution of the proposed amendment to Annex 11.	Training Centres	Flight Procedures Programme Offices
Symposium	Fatigue Management Approaches: Evolution from the cockpit to the ATC unit (5-6 April 2016)	
Website	ICAO Fatigue Management iKit	

**5. UNIVERSAL SAFETY OVERSIGHT AUDIT
PROGRAMME (USOAP)**

5.1 The following revisions to the protocol questions (PQs) will be necessary and will be considered during the next amendment cycle of the protocol questions:

- a) PBCS provisions will require an amendment of the USOAP CMA protocol questions in the areas of ANS and OPS to assess effective implementation by States.
- b) a comprehensive set of protocol questions concerning procedure design and oversight is under development and will be made available in due time for the application date; and
- c) the fatigue management SARPs will require an amendment of the USOAP CMA protocol questions to allow assessment of effective implementation by States.

IMPACT ASSESSMENT IN RELATION TO AMENDMENT 50 TO ANNEX 11

1. INTRODUCTION

1.1 Amendment 50 to Annex 11 is intended to address the requirements for the following:

- Air traffic service provision predicated on communication and surveillance performance and establishment of a PBCS monitoring programme when RCP and RSP specifications are prescribed.
- The regulatory framework on instrument flight procedure design service and definition of the responsibilities of Contracting States on the provision of safe flight procedures.
- The need to amend the definition of SIGMET to reflect the fact that these are issued for non-meteorological phenomena (such as volcanic ash and radioactive particles).
- SARPS relating to fatigue management for air traffic controllers.

2. IMPACT ASSESSMENT

Amendments concerning performance-based communication and surveillance (PBCS)

2.1 *Safety impact:* A positive safety impact is envisaged with the implementation of this proposal. The proposal will enable States to ensure safe application of ATM operations predicated on communication and/or surveillance performance and that non-compliance is detected and corrected in a timely manner through monitoring programmes.

2.2 *Financial impact:* The cost impact to States is the cost of promulgating the PBCS requirements and including these requirements in the safety oversight system. The cost impact to industry may be significant depending on the level of experience gained through participation in the regional initiatives concerning the PBCS implementation. However, the costs will occur only when ANSPs plan to implement specific ATM operations predicated on communication and surveillance performance. Benefits derived from these operations will offset the implementation and operating costs.

2.3 *Security impact:* No security impact is envisaged with the implementation of this amendment.

2.4 *Environmental impact:* The proposed amendment will have a positive environmental impact as it will enable operational improvements, such as user-preferred routes and decreased flight time, thus reducing aircraft operators' fuel burn and greenhouse gas emissions.

2.5 *Efficiency impact:* The proposed amendment will enable operational improvements, such as more efficient use of the airspace, an increase in user-preferred routes, and more efficient and coordinated airborne re-routing.

2.6 *Expected implementation time:* Between one to five years. The expected implementation time will vary depending on the level of experience gained through implementation of the PBCS concept on a regional level.

Amendments concerning procedure design and oversight SARPs

2.7 *Safety impact:* The introduction of this proposed amendment to Annex 11 will lead to the improvement of flight safety through consistent implementation of instrument flight procedure design services and oversight of the services by States.

2.8 *Financial impact:* The financial impact to States is the cost of incorporating this proposed amendment into national requirements and including such requirements into the safety oversight activities for the provision of an instrument flight procedure design service. The financial impact to industry will be related to providers of an instrument flight procedure design service establishing work procedures that meet the new framework. However, this cost may be offset by the improvement in work efficiency due to a clearly defined regulatory framework.

2.9 *Security impact:* No security impact is envisaged with the implementation of the amendments concerning procedure design and oversight proposal.

2.10 *Environmental impact:* A well-defined regulatory framework will facilitate implementation of environmentally-friendly technology such as PBN, CDO, CCO.

2.11 *Efficiency impact:* Implementing this proposal will improve the work efficiency of instrument flight procedure design service by Contracting States, leading to improvement in efficiency of the air transportation system.

2.12 *Expected implementation time:* The timeframe for implementation is likely to be variable depending on the resources available and existing regulatory maturity in each State. Some States already have this requirement implemented whereas for other States the timescales could be anything from two to five years.

Consequential amendment concerning aeronautical meteorology

2.13 *Safety impact:* No Safety impact is envisaged with the implementation of the this proposal.

2.14 *Financial impact:* No financial impact is envisaged with the implementation of this proposal.

2.15 *Security impact:* No security impact is envisaged with the implementation of this proposal.

2.16 *Environmental impact:* No environmental impact is envisaged with the implementation of this proposal.

2.17 *Efficiency impact:* No efficiency impact is envisaged with the implementation of this proposal.

2.18 *Expected implementation time:* Six months.

Amendment concerning fatigue management for air traffic controllers

2.19 *Safety impact:* Fatigue can diminish an air traffic controller's ability to perform all operational tasks. Reduced risk of performance declines amongst air traffic controllers due to fatigue will result in increased safety margins when undertaking safety-critical operational activities.

2.20 *Financial impact:* There may be substantial financial impact to States when developing prescriptive limitation regulations. This is related to the possible need to gain subject matter expertise and time spent on industry consultation to address the sensitive issue of work hours. The continued oversight of these regulations will be an addition to a State's regular oversight programme but should not add substantially to current SMS oversight activities. The establishment of FRMS regulations is optional and should depend on the resources of the State. Where the decision is made to establish FRMS regulations for ANSPs, it is likely that the State has developed, or is in the process of developing, FRMS regulations for airline operators. This will largely ease the significant costs of establishing an FRMS approval process and the associated initial oversight responsibilities.

2.21 *Security impact:* No security impact is envisaged with the implementation of the FRMS proposal.

2.22 *Environmental impact:* No environmental impact is envisaged with the implementation of the FRMS proposal.

2.23 *Efficiency impact:* Prescriptive duty limitations regulations will offer safety gains. In some States, the development of associated processes that such regulations will require may also result in some improvements to efficiency in the provision of air traffic services. However, in general, prescriptive duty limitations regulations are unlikely to impact operational efficiency. In contrast FRMS regulations, where established, offer increased flexibility and efficiency benefits over the prescriptive approach to fatigue management while maintaining or enhancing safety margins.

2.24 *Expected implementation time:* While FRMS regulations are optional with no time imperative, many States will require at least five years to establish prescriptive duty limitation regulations. The proposed early effective date and early availability of comprehensive guidance material, along with an extended applicability date, aims to allow States the necessary time to develop scientifically based fatigue management regulations suited to their aviation industry context.

AMENDMENT No. 50-A

TO THE

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AIR TRAFFIC SERVICES

ANNEX 11

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

The amendment to Annex 11 contained in this document was adopted by the Council of ICAO on **22 February 2016**. Such parts of this amendment as have not been disapproved by more than half of the total number of Contracting States on or before **11 July 2016** will become effective on that date and will become applicable on **10 November 2016** as specified in the Resolution of Adoption. (State letter AN 13/13.1-16/39 refers.)

FEBRUARY 2016

INTERNATIONAL CIVIL AVIATION ORGANIZATION

**AMENDMENT 50 TO THE INTERNATIONAL STANDARDS AND
RECOMMENDED PRACTICES**

ANNEX 11 — AIR TRAFFIC SERVICES

RESOLUTION OF ADOPTION

The Council

Acting in accordance with the Convention on International Civil Aviation, and particularly with the provisions of Articles 37, 54 and 90 thereof,

1. *Hereby adopts* on 22 February 2016 Amendment 50 to the International Standards and Recommended Practices contained in the document entitled *International Standards and Recommended Practices, Air Traffic Services* which for convenience is designated Annex 11 to the Convention;
2. *Prescribes* 11 July 2016 as the date upon which the said amendment shall become effective, except for any part thereof in respect of which a majority of the Contracting States have registered their disapproval with the Council before that date;
3. *Resolves* that the said amendment or such parts thereof as have become effective shall become applicable on 10 November 2016¹;
4. *Requests the Secretary General:*
 - a) to notify each Contracting State immediately of the above action and immediately after 11 July 2016 of those parts of the amendment which have become effective;
 - b) to request each Contracting State:
 - 1) to notify the Organization (in accordance with the obligation imposed by Article 38 of the Convention) of the differences that will exist on 10 November 2016¹ between its national regulations or practices and the provisions of the Standards in the Annex as hereby amended, such notification to be made before 10 October 2016², and thereafter to notify the Organization of any further differences that arise;
 - 2) to notify the Organization before 10 October 2016² of the date or dates by which it will have complied with the provisions of the Standards in the Annex as hereby amended;
 - c) to invite each Contracting State to notify additionally any differences between its own practices and those established by the Recommended Practices, following the procedure specified in subparagraph b) above with respect to differences from Standards.

¹ 5 November 2020 for Chapter 1 Definitions; Chapter 2, paragraph 2.28; Appendices 6 and 7.

² 5 October 2020 for Chapter 1 Definitions; Chapter 2, paragraph 2.28; Appendices 6 and 7.

**NOTES ON THE PRESENTATION OF THE
AMENDMENT 50-A TO ANNEX 11**

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. **New text to be inserted is highlighted with grey shading.** new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the **replacement text which is highlighted with grey shading.** new text to replace existing text

TEXT OF AMENDMENT 50-A
TO THE
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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1.1 Definitions

...

Instrument flight procedure design service. A service established for the design, documentation, validation, maintenance and periodic review of instrument flight procedures necessary for the safety, regularity and efficiency of air navigation.

...

Performance-based communication (PBC). Communication based on performance specifications applied to the provision of air traffic services.

Note.— An RCP specification includes communication performance requirements that are allocated to system components in terms of the communication to be provided and associated transaction time, continuity, availability, integrity, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

...

Performance-based surveillance (PBS). Surveillance based on performance specifications applied to the provision of air traffic services.

Note.— An RSP specification includes surveillance performance requirements that are allocated to system components in terms of the surveillance to be provided and associated data delivery time, continuity, availability, integrity, accuracy of the surveillance data, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

...

~~***RCP type.*** A label (e.g. RCP 240) that represents the values assigned to RCP parameters for communication transaction time, continuity, availability and integrity.~~

Required communication performance (RCP) specification.—~~A statement of the performance requirements for operational communication in support of specific ATM functions. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.~~

Required surveillance performance (RSP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

...

SIGMET information. Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena ~~which~~ and other phenomena in the atmosphere that may affect the safety of aircraft operations.

...

CHAPTER 2. GENERAL

...

2.8 ~~Required communication performance (RCP)~~ Performance-based communication (PBC) operations

2.8.1 In applying performance-based communication (PBC), RCP ~~types~~ specifications shall be prescribed by States. When applicable, the RCP ~~type(s)~~ specification(s) shall be prescribed on the basis of regional air navigation agreements.

Note.— *In prescribing an RCP specification, limitations may apply as a result of communication infrastructure constraints or specific communication functionality requirements.*

2.8.2 The prescribed RCP ~~type~~ specification shall be appropriate to the air traffic services provided.

Note.— *Applicable RCP types and associated procedures will be published in the Manual on Required Communication Performance (RCP) (Doc 9869) (in preparation). Information on the performance-based communication and surveillance (PBCS) concept and guidance material on its implementation are contained in the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869).*

2.9 Performance-based surveillance (PBS) operations

2.9.1 In applying performance-based surveillance (PBS), RSP specifications shall be prescribed by States. When applicable, the RSP specification(s) shall be prescribed on the basis of regional air navigation agreements.

Note.— *In prescribing an RSP specification, limitations may apply as a result of surveillance infrastructure constraints or specific surveillance functionality requirements.*

2.9.2 The prescribed RSP specification shall be appropriate to the air traffic services provided.

2.9.3 Where an RSP specification has been prescribed by States for performance-based surveillance, ATS units shall be provided with equipment capable of performance consistent with the prescribed RSP specification(s).

Note.— Information on the PBCS concept and guidance material on its implementation are contained in the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869).

2.910 Establishment and designation of the units providing air traffic services

Editorial Note.— Renumber subsequent paragraphs accordingly.

...

2.33 Instrument flight procedure design service

States shall ensure that an instrument flight procedure design service is in place in accordance with Appendix 8.

...

CHAPTER 3. AIR TRAFFIC CONTROL SERVICE

...

3.3 Operation of air traffic control service

...

3.3.5.1 For all airspace where a reduced vertical separation minimum of 300 m (1 000 ft) is applied between FL 290 and FL 410 inclusive, a programme shall be instituted, on a regional basis, for monitoring the height-keeping performance of aircraft operating at these levels, in order to ensure that the continued application of this vertical separation minimum meets the safety objectives. The scope of regional monitoring programmes shall be adequate to conduct analyses of aircraft group performance and evaluate the stability of altimetry system error.

Note.— Guidance material relating to vertical separation and monitoring of height-keeping performance is contained in the Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574).

3.3.5.2 Where RCP/RSP specifications are applied, programmes shall be instituted for monitoring the performance of the infrastructure and the participating aircraft against the appropriate RCP and/or RSP specifications, to ensure that operations in the applicable airspace continue to meet safety objectives. The scope of monitoring programmes shall be adequate to evaluate communication and/or surveillance performance, as applicable.

Note.— Guidance material relating to RCP and RSP specifications and monitoring of communication and surveillance performance is contained in the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869).

3.3.5.32 **Recommendation** — Arrangements shall be put in place, through interregional agreement, for the sharing between regions of data and/or information from monitoring programmes.

Note. — ~~Guidance material relating to vertical separation and monitoring of height-keeping performance is contained in the Manual on Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574).~~

...

CHAPTER 6 AIR TRAFFIC SERVICES REQUIREMENTS FOR COMMUNICATIONS

6.1 Aeronautical mobile service (air-ground communications)

6.1.1 General

...

6.1.1.2 Where an RCP specification has types have been prescribed by States for performance-based communication-ATM functions, ATS units shall, in addition to the requirements specified in 6.1.1.1, be provided with communication equipment which will enable them to provide ATS in accordance with the prescribed RCP specification(s) type(s).

Note. — ~~Information on RCP and associated procedures, and guidance concerning implementation the approval process will be contained in the Manual on Required Communication Performance (RCP) (Doc 9869) (in preparation). This document also contains a list of references to other documents produced by States and international bodies concerning communication systems and RCP. Information on the performance-based communication and surveillance (PBCS) concept and guidance material on its implementation are contained in the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869).~~

...

6.2 Aeronautical fixed service (ground-ground communications)

6.2.1 General

...

6.2.1.2 Where RCP types have been prescribed by States for ATM functions, ATS units shall, in addition to the requirements specified in 6.2.1.1, be provided with communication equipment which will enable them to provide ATS in accordance with the prescribed RCP type(s).

Note. — ~~Information on RCP and associated procedures, and guidance concerning implementation the approval process, will be contained in the Manual on Required Communication Performance (RCP) (Doc 9869) (in preparation). This document also contains references to other documents produced by States and international bodies concerning communication systems and RCP.~~

...

Editorial note.— Insert new Appendix 8 as follows:

**APPENDIX 8. STATE RESPONSIBILITIES CONCERNING
AN INSTRUMENT FLIGHT PROCEDURE DESIGN SERVICE**

(Note.— See Chapter 2, 2.33)

1. A State shall:
 - a) provide an instrument flight procedure design service; and/or
 - b) agree with one or more Contracting State(s) to provide a joint service; and/or
 - c) delegate the provision of the service to external agency(ies).
2. In all cases in paragraph 1 above, the State concerned shall approve and remain responsible for all instrument flight procedures for aerodromes and airspace under the authority of the State.
3. Instrument flight procedures shall be designed in accordance with State-approved design criteria.
4. Each State shall ensure that an instrument flight procedure design service provider intending to design an instrument flight procedure for aerodromes or airspace under the authority of that State meets the requirements established by that State's regulatory framework.

Note.—Guidance material for regulatory framework for the oversight of instrument flight procedure design service is contained in the Manual on the Development of a Regulatory Framework for Instrument Flight Procedure Design Service (Doc XXXX).

5. A State shall ensure that an instrument flight procedure design service provider utilize a quality management system at each stage of the instrument flight procedure design process.

Note.— This requirement can be met by means of a quality assurance methodology, such as that described in PANS-OPS (Doc 8168), Volume II, Part I, Section 2, Chapter 4 — Quality Assurance. Guidance for implementing such a methodology is contained in The Quality Assurance Manual for Flight Procedure Design (Doc 9906).

6. A State shall ensure that maintenance and periodic review of instrument flight procedures for aerodromes and airspace under the authority of the State are conducted. Each State shall establish an interval for periodic review of instrument flight procedures not exceeding five years.

Note.— Guidance on maintenance and periodic review is contained in the Quality Assurance Manual for Flight Procedure Design (Doc 9906).

End of new text

— END —

AMENDMENT No. 50-B

TO THE

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AIR TRAFFIC SERVICES

ANNEX 11

TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

The amendment to Annex 11 contained in this document was adopted by the Council of ICAO on **22 February 2016**. Such parts of this amendment as have not been disapproved by more than half of the total number of Contracting States on or before **11 July 2016** will become effective on that date and will become applicable on **5 November 2020** as specified in the Resolution of Adoption. (State letter AN 13/13.1-16/39 refers.)

FEBRUARY 2016

INTERNATIONAL CIVIL AVIATION ORGANIZATION

**AMENDMENT 50 TO THE INTERNATIONAL STANDARDS AND
RECOMMENDED PRACTICES**

ANNEX 11 — AIR TRAFFIC SERVICES

RESOLUTION OF ADOPTION

The Council

Acting in accordance with the Convention on International Civil Aviation, and particularly with the provisions of Articles 37, 54 and 90 thereof,

5. *Hereby adopts* on 22 February 2016 Amendment 50 to the International Standards and Recommended Practices contained in the document entitled *International Standards and Recommended Practices, Air Traffic Services* which for convenience is designated Annex 11 to the Convention;

6. *Prescribes* 11 July 2016 as the date upon which the said amendment shall become effective, except for any part thereof in respect of which a majority of the Contracting States have registered their disapproval with the Council before that date;

7. *Resolves* that the said amendment or such parts thereof as have become effective shall become applicable on 10 November 2016¹;

8. *Requests the Secretary General:*

- a) to notify each Contracting State immediately of the above action and immediately after 11 July 2016 of those parts of the amendment which have become effective;
- b) to request each Contracting State:
 - 1) to notify the Organization (in accordance with the obligation imposed by Article 38 of the Convention) of the differences that will exist on 10 November 2016¹ between its national regulations or practices and the provisions of the Standards in the Annex as hereby amended, such notification to be made before 10 October 2016², and thereafter to notify the Organization of any further differences that arise;
 - 2) to notify the Organization before 10 October 2016² of the date or dates by which it will have complied with the provisions of the Standards in the Annex as hereby amended;
- c) to invite each Contracting State to notify additionally any differences between its own practices and those established by the Recommended Practices, following the procedure specified in subparagraph b) above with respect to differences from Standards.

¹ 5 November 2020 for Chapter 1 Definitions; Chapter 2, paragraph 2.28; Appendices 6 and 7.

² 5 November 2020 for Chapter 1 Definitions; Chapter 2, paragraph 2.28; Appendices 6 and 7.

**NOTES ON THE PRESENTATION OF THE
AMENDMENT 50-B TO ANNEX 11**

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. New text to be inserted is highlighted with grey shading. new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

**TEXT TO AMENDMENT 50-B TO THE
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AIR TRAFFIC SERVICES

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

...

CHAPTER 1. DEFINITIONS

...

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.

...

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.

...

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 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, knowledge and 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.

...

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, knowledge and operational experience, 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.

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.

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.

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

...

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.

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.

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.

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

— END —