



WORKING PAPER

AIR NAVIGATION COMMISSION

Programme No. 9: Aerodrome Safety

**FINAL REVIEW OF PROPOSED AMENDMENTS TO
ANNEX 14, VOLUME I ARISING FROM THE AP/2 MEETING AND CONSEQUENTIAL
AMENDMENTS TO ANNEX 15 AND THE PANS-ATM (DOC 4444)
(Item No. 18807)**

(Presented by the Director of the Air Navigation Bureau)

SUMMARY

This working paper presents the results of a consultation with States and international organizations on a proposal to amend Annex 14, Volume I – *Aerodrome Design and Operations*, arising from the recommendations of the second meeting of the Aerodromes Panel (AP). A summary of replies is given in Appendix A. Substantive comments are shown in Appendix B, together with the Secretariat's comments and proposals for action.

Action by the Air Navigation Commission is in paragraph 6.

COORDINATION

ATM, CMO, IIM, MET, OPS

REFERENCES

- | | |
|---------------------------------|---|
| *AN-WP/8545.PDP | *Annex 15 |
| *AN-WP/8545 | *PANS-ATM (Doc 4444) |
| *DP No. 1 related to AN-WP/8545 | *Report of the AP/2 Meeting |
| *DP No. 2 related to AN-WP/8545 | (http://portal.icao.int/) |
| *DP No. 3 related to AN-WP/8545 | *State letter AN 4/1.1.52-11/41 |
| AN-WP/8385 | |
| *AN Min. 186-8 | |
| AN Min. 184-5 | |
| *Annex 14, Volume I | |

This working paper relates to the Safety Objective.

*Principal references

1. INTRODUCTION

1.1 On 15 March 2011, the Air Navigation Commission (186-8) carried out a preliminary review (AN-WP/8545.PDP) of a proposal developed by the Aerodromes Panel (AP/2) for amendment of Annex 14 - *Aerodromes*, Volume I – *Aerodrome Design and Operations* and Volume II – *Heliports*, and consequential amendments to Annex 15 – *Aeronautical Information Services* and the *Procedures for Air Navigation Services — Air Traffic Management*, (Doc 4444).

1.2 The Commission agreed that the proposals be transmitted to States and appropriate international organizations for comment. Accordingly, State letter AN 4/1.1.52-11/41 dated 30 May 2011 was sent with a due date for replies of 15 September 2011.

2. SUMMARY OF REPLIES

2.1 By 15 September 2011, forty-seven replies had been received from forty-four States, including eight Council Member States, and three international organizations. By 14 November 2011, seventy-one replies had been received from sixty-six States and five international organizations. A summary of replies is in Appendix A.

3. NATURE AND SCOPE OF THE REPLIES

3.1 The majority of replies indicate support for the proposed amendments.

4. SECRETARIAT REVIEW

4.1 Substantive comments received from States and international organizations on the amendment proposals, the Secretariat's review of these comments and the associated action proposed are in Appendix B.

5. APPLICABILITY

5.1 An applicability date of 14 November 2013 is envisaged for the proposed amendments to Annex 14, Volume I.

5.2 An applicability date of 14 November 2013 is envisaged for the proposed amendments to Annex 15.

5.3 An applicability date of 13 November 2014 is envisaged for the proposed amendments to PANS-ATM (Doc 4444).

6. **ACTION BY THE AIR NAVIGATION COMMISSION**

6.1 The Air Navigation Commission is invited to:

- a) note the summary of replies in Appendix A;
- b) consider the material in Appendix B and decide on the action to be taken on all matters raised therein;
- c) agree that the proposed amendments to Annex 14, Volume I as contained in Attachment A to State letter AN 4/1.1.52-11/41 and as modified by action taken under b) above, be included in Amendment 11 to Annex 14, Volume I;
- d) agree that the proposed amendments to Annex 15 as contained in Attachment B to State letter AN 4/1.1.52-11/41 and as modified by action taken under b) above, be consolidated with other amendment proposals for inclusion in Amendment 37 to Annex 15;
- e) agree that the proposed amendments to the PANS-ATM (Doc 4444) as contained in Attachment C to State letter AN 4/1.1.52-11/41 and as modified by action taken under b) above, be consolidated with other amendment proposals for inclusion in Amendment 6 to the PANS-ATM (Doc 4444);
- f) agree that the proposed amendments to Annex 14, Volume I should become applicable on 14 November 2013;
- g) agree that the proposed amendments to Annex 15 should become applicable on 14 November 2013;
- h) agree that the proposed amendments to the PANS-ATM (Doc 4444) should become applicable on 13 November 2014; and
- i) instruct the Secretary regarding the preparation of the draft report to Council.

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APPENDIX A

SUMMARY OF REPLIES TO STATE LETTER AN 4/1.1.52 -11/41

A — Agreement without comments (includes “no objections”) AC — Agreement with comments and/or reservations
 DC — Disagreement with comments NP — No indication of position (includes “no comments” and acknowledgements)

Note.— X in the “AC” and “DC” columns indicates that the State concerned agrees with comments on certain parts of the amendment whilst disagreeing with others.

*23/21852/1210State/International Organization	Annex 14, Volume I				Annex 15				PANS-ATM (Doc 4444)			
	A	AC	DC	NP	A	AC	DC	NP	A	AC	DC	NP
Afghanistan												
Albania												
Algeria												
Andorra												
Angola												
Antigua and Barbuda												
Argentina												
Armenia												
Australia*		X	X		X				X			
Austria		X				X			X			
Azerbaijan												
Bahamas												
Bahrain	X				X				X			
Bangladesh												
Barbados												
Belarus												
Belgium		X			X				X			
Belize												
Benin												
Bhutan												
Bolivia												
Bosnia and Herzegovina		X			X				X			
Botswana	X				X				X			
Brazil		X						X				X
Brunei Darussalam												
Bulgaria												
Burkina Faso												
Burundi												
Cambodia												
Cameroon												
Canada*		X	X			X	X					
Cape Verde												
Central African Republic												
Chad												
Chile		X			X				X			
China	X				X				X			
Colombia												
Comoros	X				X				X			
Congo												
Cook Islands												
Costa Rica												
Côte d'Ivoire												
Croatia												
Cuba	X				X				X			
Cyprus		X				X			X			
Czech Republic	X				X				X			
Democratic People's Republic of Korea		X			X				X			
Democratic Republic of the Congo												
Denmark												
Djibouti												
Dominican Republic		X				X				X		
Ecuador												
Egypt												
El Salvador												
Equatorial Guinea												
Eritrea												
Estonia	X				X				X			
Ethiopia	X				X				X			
Fiji	X				X				X			
Finland		X				X			X			
France		X				X			X			
Gabon												

*States agree with the amendment proposal in general with some disagreement on certain points.

*23/21852/1210State/International Organization	Annex 14, Volume I				Annex 15				PANS-ATM (Doc 4444)			
	A	AC	DC	NP	A	AC	DC	NP	A	AC	DC	NP
Gambia												
Georgia												
Germany*		X	X				X			X		
Ghana												
Greece	X				X				X			
Grenada												
Guatemala												
Guinea												
Guinea-Bissau												
Guyana												
Haiti												
Honduras												
Hungary	X				X				X			
Iceland		X			X				X			
India												
Indonesia	X				X				X			
Iran (Islamic Republic of)												
Iraq												
Ireland		X				X				X		
Israel												
Italy		X				X				X		
Jamaica												
Japan*		X	X		X				X			
Jordan	X				X				X			
Kazakhstan				X				X				
Kenya												
Kiribati												
Kuwait	X				X				X			
Kyrgyzstan												
Lao People's Democratic Republic												
Latvia	X				X				X			
Lebanon												
Lesotho												
Liberia		X										
Libyan Arab Jamahiriya												
Lithuania												
Luxembourg												
Madagascar												
Malawi												
Malaysia	X				X				X			
Maldives												
Mali												
Malta												
Marshall Islands												
Mauritania												
Mauritius	X				X				X			
Mexico												
Micronesia (Federated States of)												
Monaco												
Mongolia				X				X				X
Montenegro												
Morocco	X				X				X			
Mozambique												
Myanmar												
Namibia												
Nauru												
Nepal												
Netherlands			X				X				X	
New Zealand		X				X				X		
Nicaragua												
Niger												
Nigeria												
Norway*		X	X			X	X			X		
Oman												
Pakistan	X				X				X			
Palau												
Panama	X								X			
Papua New Guinea												
Paraguay					X				X			
Peru												
Philippines	X				X				X			
Poland	X				X				X			

*States agree with the amendment proposal in general with some disagreement on certain points.

*23/21852/1210State/International Organization	Annex 14, Volume I				Annex 15				PANS-ATM (Doc 4444)			
	A	AC	DC	NP	A	AC	DC	NP	A	AC	DC	NP
Portugal												
Qatar												
Republic of Korea		X			X				X			
Republic of Moldova		X			X				X			
Romania	X				X				X			
Russian Federation		X				X				X		
Rwanda												
Saint Kitts and Nevis												
Saint Lucia												
Saint Vincent and the Grenadines												
Samoa												
San Marino												
Sao Tome and Principe												
Saudi Arabia												
Senegal												
Serbia												
Seychelles												
Sierra Leone												
Singapore		X			X				X			
Slovakia	X				X				X			
Slovenia	X				X				X			
Solomon Islands												
Somalia												
South Africa	X				X				X			
Spain			X									
Sri Lanka												
Sudan				X				X	X			
Suriname												
Swaziland												
Sweden*		X	X				X				X	
Switzerland		X				X			X			
Syrian Arab Republic												
Tajikistan												
Thailand												
The former Yugoslav Republic of Macedonia	X				X				X			
Timor-Leste												
Togo												
Tonga												
Trinidad and Tobago												
Tunisia												
Turkey	X				X				X			
Turkmenistan												
Uganda	X				X				X			
Ukraine												
United Arab Emirates		X			X				X			
United Kingdom		X			X				X			
United Republic of Tanzania												
United States		X				X				X		
Uruguay		X			X				X			
Uzbekistan	X				X				X			
Vanuatu												
Venezuela												
Viet Nam												
Yemen												
Zambia												
Zimbabwe												
International Organizations												
ACI		X			X				X			
CANSO												
EASA												
EUROCONTROL	X					X			X			
IAOPA												
IATA		X				X				X		
IBAC												
ICCAIA			X			X				X		
IFALPA*		X	X		X				X			
IFATCA												
TOTALS	31	33	10	3	46	16	5	4	53	10	2	2

*States agree with the amendment proposal in general with disagreement on certain points.

APPENDIX B

COMMENTS OF STATES AND INTERNATIONAL ORGANIZATIONS IN RESPONSE TO STATE LETTER AN 4/1.1.52-11/41

Note.— All references are to the attachments to State letter AN 4/1.1.52-11/41 unless indicated otherwise.

REFERENCE: General comments

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

ICAO State letter AN 4/1.1.52-11/41 contains a considerable number of proposed changes to the SARPs of Annex 14, covering the majority of its chapters. However, some of the proposed changes, although they are located in different chapters of the Annex, are related with each other, as they aim at the same safety objective. In this respect, a large number of the proposed amendments are related to the prevention and mitigation of runway excursions (veer-offs and overruns), while other amendments are related to the prevention of runway incursions. On the other hand, a considerable amount of changes cover provisions related to the aerodrome emergency planning and rescue and fire fighting.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

We note with satisfaction that the majority of the proposals contribute significantly to clarity, specifically as concerns pavement grip. Nevertheless, we believe it is important to highlight the following points.

The proposed recommendation 2.9.7 A is a matter of guidance rather than a recommendation. It explains why, in fact, runway surface friction measurements made on a runway contaminated by slush, wet snow or wet ice should not be reported, but its status as a recommendation implies, in contrast, that this should be done for the other circumstances. This is far from always being the case, however, since problems associated with the relevance and accuracy of the measured value (problems concerning the appropriateness of the type of measurement device, calibration problems, implementation problems, etc.) often result in the information provided being unreliable.

- Specification 3.2.5 concerning runway shoulders sets out the objectives and refers to the ICAO Aerodrome Design Manual. This manual, however, puts forth other objectives that indicate the size of the shoulder widths. The aim is to be able to prevent jet blast surface erosion and the ingestion of the surface material by the engines. These objectives are paramount and should be contained in Annex 14.
- The blast pad introduced in 3.4.11 and 3.4.12 has the same objectives as the taxiway shoulders as regards handling a taxiing aeroplane intending to align. As a result, certain aspects should be reviewed, especially concerning the part able to withstand the occasional passage of an aeroplane.

- The rules concerning the enhanced taxiway centre line markings are complex and should be simplified (5.2.8.9 in particular).
- The proposals concerning the simple touchdown zone lights (5.3.13.7) should be included in the guidance after re-drafting. Indeed, the note in this specification implies that this type of system cannot be installed without the pilots having special knowledge thereof. Furthermore, this type of system cannot be installed in an international aerodrome open to the public where it is impossible to know whether all of the pilots are well-informed about the role attributed to these lights. Under these conditions, the simple touchdown zone lights should not be specified in Annex 14.
- The possibility to carry out modular tests of the emergency plans is undeniably an improvement that enables the weaknesses of the plans to be more easily identified. This should make it possible to limit the conduct of full-scale exercises to once every five years rather than every three years as proposed by ICAO.
- Proposal 9.2.12 A concerning the rescue and fire fighting service is not clear and does not allow for the possibility of having a remission factor. It would have been simpler and clearer to have a table similar to table 9.2 in Annex 14, but with the quantities recalculated for each of the theoretical aeroplanes having the maximum dimensions per category. This table would be merely a recommendation, since such aeroplanes would not necessarily fly to the aerodrome concerned, and since specification 9.2.12 also exists, which recommends recalculations of the quantities if the aeroplanes handled at the aerodrome are of a larger than average size. Such a table had been presented to the ICAO Aerodrome Panel.
- The language in Section 8 of Attachment A concerning drainage places particular importance on grooving. Grooving is not necessarily the best solution, however, and in any case, it is not the only solution. Characteristics such as the pavement slopes and the quality of the materials used are of primary concern to drainage. Furthermore, drainage is not as efficient as thought in terms of being a system in which the discharges and collectors located on the exterior of the pavements operate.
- Chapter 6 confuses the terms “objects” and “obstacles” and does not take into account the latest change in the definition of “obstacle” in Annex 14. It would be useful to review this chapter in order to take these problems into account.
- In several specifications (for example, in 3.9.15), the term “suitable” is used without any additional specification, which leaves the door open to a broad range of interpretations. It would be useful to specify to what this term refers. Thus, and as we have understood it, it would be preferable to indicate “suitable for the safety of taxiing aircraft” in the cited example.
- The term “level” is often misused. In fact, it implies that several levels exist, and, as a result, it corresponds to nothing. This is the case of specification 3.5.5 concerning the arresting systems on the RESAs, the objective of which remains to be specified. Furthermore, it is not possible to identify the subject of specification 9.2.41 concerning the rescue and fire fighting service.

We would like to stress that we have identified terminological problems that could feasibly give rise to ambiguities, which is not conducive to the correct interpretation and application of the texts. The large number of comments is due in part to the ambiguities of some of the language in French, but also frequently in English, as brought to light through the translation. We felt that the language in the Annex needed to be improved. Such a task should have been taken on by the experts.

The large number of comments is due in part to the fact that certain language in French, but also frequently in English as brought to light by the translation, is not sufficiently precise and gives rise to ambiguities, which is not conducive to the correct interpretation and application of the text. We felt that the language in the Annex needed to be improved. It would have been useful had the ICAO Aerodrome Panel consisting of ad hoc experts taken on this task.

Netherlands

A: Undesirable changes to proposals

The Netherlands which has a representative in the Aerodromes Panel finds it disappointing that changes were made to the original and agreed AP/2 proposals for amendment of Annex 14 Volume I, Annex 15 and PANS-ATM (Doc 4444). Some proposals that were changed and others that were eliminated would make a positive contribution to safety. Given the discussion in the AP The Netherlands would welcome that some of the original agreed AP/2 proposals would be included in the proposal for amendment AN 4/1.1.52-11/41., especially the proposals reducing the risks of runway incursions.

B: Outdated Service Manuals

Some paragraphs of the Annex 14 volume I include a reference to an Aerodrome Service Manual (ADM) that is outdated and in some cases the back ground material that is referred to has no significance. There is a need for up to date background information and ICAO should give priority to the update of the ADM's.

Norway

The Norwegian CAA has received the comments set out in this paragraph from AIBN. The Norwegian CAA is in the process of handling the recommendations described in the report, but has not finished this work.

We encourage ICAO to take the AIBN report and their comments into consideration.

AIBN has published a report on Winter Operations, Friction Measurements and Conditions for Friction Predictions: <http://www.aibn.no/Luftfart/Rapporter/2011-10>. Based on this report the AIBN has submitted the following comments to State Letter AN 4/1.1.52-11/41, on areas where differences exist between the report and the existing text and suggested amendments to ICAO Annex 14 and Annex 15:

Russian Federation

(Note.— See appropriate partial language version of this AN-WP for original text.)

In the current ICAO documents [Annex 14 Volume I, Annex 15 and PANS-ATM (Doc 4444)] runway surface friction is determined by calculating the numerical value of the braking coefficient μ and assessing the braking action in terms of “GOOD”, “MEDIUM, MEDIUM TO GOOD”, “MEDIUM”, “MEDIUM TO POOR”, “POOR”, and the coefficient μ measuring device.

In the ICAO proposed amendments only estimated surface friction is to be provided, categorized as “GOOD”, “MEDIUM/GOOD”, “MEDIUM”, “MEDIUM/POOR”, and “POOR” without any indication of the specific coefficient μ or reference to the friction measuring device.

Eliminating the reference to the coefficient μ value and friction measuring device has the following drawbacks when compared with the existing text:

Currently a number of different devices are used to measure runway friction characteristics. These devices have different designs and principles for measuring the braking coefficient. Thus, the value

of coefficient μ for one and the same runway, using different measuring devices, may vary significantly. When specific values for the coefficient μ and friction measuring devices are provided it is possible to then use the correlation table to compare the coefficient μ values calculated using a friction measuring device, with an ICAO approved measuring device. If the coefficient μ values are not indicated nor the type of measuring device, it will be difficult to provide the end user with a true indication of the friction level.

The numerical values for braking coefficient μ along with an indication of the measuring device are used to determine the possibility of aircraft taking off/landing in strong crosswinds. There are a number of aircraft which have restrictions on takeoff/landing depending on the ratio between the coefficient μ and the crosswind speed component. Depending on the crosswind speed, the minimal coefficient μ value recommended for take offs/landings may be in the range of 0.4 to 0.6. The proposed ICAO assessment of braking action as “GOOD” does not make it possible to determine whether it is feasible for a given aircraft to take off/land in strong crosswind conditions.

EUROCONTROL

The proposed amendments to Annex 15 are primarily focusing on the reporting format of the SNOWTAM. However, the proposed removal of measured friction values is affecting additional sections in Annex 15 and consequentially ICAO Doc 8126 AIS Manual. These findings are included in the comments below.

Further, with the proposal of removing measured friction values and re-allocation of code figures for deposit types in the SNOWTAM, it is observed that the State Letter is missing the link to meteorological information and runway state reporting defined by ICAO Annex 3. It is suggested that proposed changes to the SNOWTAM format and the corresponding meteorological reporting formats are coordinated to achieve a harmonised implementation of amendments to ICAO provisions. These findings are included in the comments below.

SECRETARIAT’S COMMENTS

France summarizes all the issues raised against specific areas in this Section. These comments are repeated in detail against specific references in the State letter. Therefore, the Secretariat will address those specific comments separately in the following body of Appendix B to this paper.

It is also noted that the general comments from **Norway, Russian Federation and EUROCONTROL** are duplicated in their comments on specific areas. The Secretariat will address them separately.

The comments from **Cyprus, Ireland, Italy** is noted.

With respect to comment A from the **Netherlands**, the Secretariat believes that the preliminary review by the ANC was conducted following a standard procedure. For the second comment, the Secretariat will address the issue on guidance material in relation to specific references subsequently.

ACTION PROPOSED

See below.

REFERENCE: Page A-2, 1.1 Definition of RESA

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Canada

Disagreement with comments: The additional text raises the following concerns:

- Use of the words "continue its approach" is inappropriate here, since an aircraft that would touch down within the RESA would no longer be in a flight condition.
- Use of the words "continue its ... landing" is problematic. It implies that an aircraft could continue a normal landing. This has great influence on the design specifications of the area with respect to having adequate strength and quality to allow for the continuance of the landing phase. These design specifications would be significantly different and even conflict with the previous objective of "... allow an aeroplane overrunning to decelerate..." as the function of one is the continuance, while the function of the other is to allow deceleration.
- For the reasons stated above, a significant number of existing RESA worldwide would be disqualified.
- The proposed text also raises great concern with respect to litigation exposure for the reasons stated above.

Final comment: Canada does not support the proposed change and suggests the retention of the current definition.

Cyprus Ireland Italy

The proposed change to the definition of RESA in Chapter 1 provides clarification about the intent of the provision of RESA without having an indirect or direct impact on the respective SARPs.

Germany

Germany, in principle, supports the proposal, but it is not clear if it is useful to describe a function within a definition. A function included in a definition would also result in structural requirements for the aerodromes (e.g. pavement, including a strip behind the runway).

Additionally, it is neither practicable nor possible to cover both the overrunning and the undershooting function within a RESA. If a RESA is prepared for an overrunning aeroplane (deceleration of overrunning speed) it cannot, at the same time, be prepared for an undershooting aeroplane without risking that the landing aeroplane suffers structural damage.

With reference to the systematics of 5.3.19.13 and the rationale of *Note 1*, Germany recommends to delete the addition in the definition of 1.1.

New Zealand

In our view, the current Runway End Safety Area definition of page A-2 is appropriate and clear. We feel that no amendment is necessary.

United Arab Emirates

Consider adding word "inadvertently" before "undershooting" and "overrunning" in the proposed additional because the clause as it's written implies that the pilot has a choice to continue his manoeuvre despite the fact that he will end up in the RESA.

ACI

The new clause should be more closely linked to the first part of the RESA definition, and we recommend the following editorial change:

Runway end safety area (RESA). An area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway., ~~and also to~~ **by** allow**ing** an aeroplane overrunning to decelerate and an aeroplane undershooting to continue its approach or landing.

SECRETARIAT'S COMMENTS

The comments from **Canada, Germany** and **New Zealand** suggest retention of the existing definition of RESA, arguing that the proposed additional text could cause various problems. The Secretariat support, in principle, their views. With regard to the comment from the **United Arab Emirates**, the Secretariat does not consider it essential to add the word "inadvertently" given that there is no evidence that the existing wording in the definition has caused any confusion. The proposed text from **ACI**, in essence, is similar to the original proposal. The comments from **Cyprus, Ireland** and **Italy** are noted. To conclude, the Secretariat agrees that the existing definition of RESA should be retained, considering also that, as a definition, it has been in the Annex for a long time without any reported ambiguity.

ACTION PROPOSED

Retain the existing definition of RESA as in Annex 14, Volume I.

REFERENCE: Page A-2, Definitions

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Uruguay

(Note.— See appropriate partial language version of this AN-WP for original text.)

(a) CHAPTER 1. GENERAL INFORMATION 1.1 Definitions

- (1) The inclusion of a definition of the term Runway Incursion, which will be used in various sections of the document, is recommended.

- (i) **RUNWAY INCURSION** Any event at an aerodrome that involves the incorrect presence of an aircraft, vehicle, or person in the protected area of a surface designated for aircraft take-off or landing.
- (2) The inclusion of the definition of the abbreviations used in various sections of the document is recommended.
 - (i) Runway holding position (RHP)
 - (ii) Runway Guard Lights (RGL)
 - (iii) Obstacle limitation surfaces (OLS)

(b) **Objects on runway strips** No fixed object, other than the visual aids required for air navigation or those required for operational aircraft safety purposes and which must be positioned on the runway strip and which meet the relevant frangibility requirements in Chapter 5, shall be permitted on the runway strip.

- (1) It is recommended that this text should include the ILS Glide Slope radio antennas used for landing.

SECRETARIAT'S COMMENTS

The proposal from **Uruguay** to add new definitions in Annex 14, Volume I is noted. However, as this was not part of the original amendment proposal presented in the State letter, this proposal should not be considered at this stage. As regards the comment on objects on runway strips, it should be noted that non-visual aids, including the ILS antennas, are covered in Chapter 9 of Annex 14, Volume I.

ACTION PROPOSED

No change.

REFERENCE: Page A-2, paragraph 2.6.6

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

The new limits to the tire pressure are based on tests and survey and envisaged to have a positive impact on the operation and use of aerodromes.

SECRETARIAT'S COMMENTS

The comments from **Cyprus, Ireland and Italy** support the proposed changes and are noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-2, paragraph 2.6.6 c)

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Brazil

Consequences in pavement performance in changes at maximum allowable tire pressure category are not fully understood (2.6.6 c). The studies carried out in order to provide an increased of 0.25MPa in tire pressure didn't considered other pavement types than asphalt concrete.

SECRETARIAT'S COMMENTS

In respect of the comment from **Brazil**, the results of full-scale tire pressure tests conducted in Toulouse (France) and Atlantic City (USA) showed that increasing tire pressure did not adversely affect pavement rutting to any significant degree. Additionally, the results of the ACI survey of pavement condition at airports worldwide in all climatic regions supported the conclusion of the full-scale tests. Restriction on tire pressure applies to flexible asphaltic pavements since rigid pavements do not require tire pressure restriction. For composite pavements which have overlays of flexible construction, they should be treated as flexible pavements for reporting permissible tire pressure. Further guidance can be found in *Aerodrome Design Manual*, Part 3 — *Pavements* (Doc 9157).

ACTION PROPOSED

No change.

REFERENCE: Page A-2, paragraph 2.6.6 c) and *Note*

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

IFALPA

The tire pressure categories have been revised and IFALPA believes that the *Note* needs to include unlimited as well as high tire pressures.

SECRETARIAT'S COMMENTS

The word “high” in “high tire pressures” contained in the proposed *Note* is to be taken in a generic sense without specifically referring to category X tire pressures. However, in order to avoid misunderstanding, the Secretariat agrees with the comment from **IFALPA** that the *Note* should be better clarified. The term “upper categories” is proposed for inclusion and is preferred over “higher categories” so as not to be confused with the word “high” in category X.

ACTION PROPOSED

Amend Note to 2.6.6 (c) to read as follows:

Note.— See Note 5 to 10.2.1 where the pavement is used by aircraft with tire pressures in the upper categories.

REFERENCE: Page A-3, Note to 2.6.6 d), *Example 4*

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Germany

The aircraft type B 747-400 is not an up-to-date aircraft. The A 380 and B 747/8 should be mentioned as examples.

IATA

Example 4 is given with reference to a B747-400 where the maximum all up mass weight quoted is now outdated as there are higher versions operating. For the sake of completeness IATA suggests the addition of an example on pavement strength data related to the A-380.

SECRETARIAT'S COMMENTS

The aircraft type indicated in *Example 4* was selected based on their common use worldwide. Although there are other B747 models (eg. B747-400ER or the B747-8), or the A380 that may be of interest in terms of pavement loading, neither of these models have achieved the same number of deliveries to the world's airlines as the B747-400. The selection of the B747-400 simply denotes a widely recognised and fairly common version of the B747 family of aircraft. Additionally, the B747-400 is also the critical aircraft at many airports worldwide in terms of their selection of a pavement classification number (PCN) *Example 4* is therefore just as valid today as it was when first introduced in Annex 14, Volume I in 2003. To address the comments from **Germany and IATA**, the latest information on the B747-8 and A380 will be included in the next revision to Doc 9157, *Aerodrome Design Manual*, Part 3 — *Pavements*.

ACTION PROPOSED

No change.

REFERENCE: Page A-4, Chapter 2, Aerodrome Data, 2.9 Condition of the movement area and related facilities

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

United States

To ensure consistency between Annex 3 and Annex 14, ICAO should update the “local reports” discussed in Annex 3 to reflect the proposed changes in this document.

SECRETARIAT'S COMMENTS

With respect to the comment from the **United States**, the link between Annex 3 and Annex 14, Volume I relating to the state of runway reports concerns METAR/SPECI rather than local reports. No changes to Annex 3 are necessary in this respect although corresponding changes are required in the World Meteorological Organization (WMO) Manual on Codes (No. 306). Since WMO is responsible for the codes used for the exchange of all meteorological information under the working arrangements between WMO and ICAO detailed in Doc 7475, *Working Arrangements between the International Civil Aviation Organization and the World Meteorological Organization*), the necessary coordination will be carried out by the Secretariat.

ACTION PROPOSED

| The Secretariat to coordinate with WMO.

REFERENCE: Page A-4, paragraphs 2.9.1 and 2.9.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

Proposed changes are considered as an enhancement to safety, as additional information regarding the status of an aerodrome is provided. Moreover, the note in paragraph 2.9.1 provides useful guidance with regard to the provision of information on the status of the aerodrome.

SECRETARIAT'S COMMENTS

The comments from **Cyprus, Ireland and Italy** support the proposed changes and are noted.

ACTION PROPOSED

| No change.

REFERENCE: Page A-4, paragraph 2.9.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The first paragraph is not very clear. As we understand it, it relates to issues concerning all types of operations at the aerodrome, since issues affecting aircraft and aerodrome operations necessarily come under the scope of all types of operations. We assume that the distinction is being made here between

operational issues (in the sense of air navigation operations) and maintenance issues. Thus we propose the following:

“The condition of the movement area and the operational status of related facilities shall be monitored, and reports ~~on matters~~ containing observations of import to ~~operational significance~~ air navigation operations at the aerodrome or affecting aircraft performance ~~given~~ aircraft and aerodrome operations shall be provided in order to take appropriate action, particularly ~~in respect of the following~~ in the following situations:

We also propose different language for note 2 in order to improve clarity.
[Translator’s note: the proposal does not affect the English text.]

Furthermore, the terms “wet ice” and “frost” should be defined in Chapter 1 of Annex 14, as is already the case for snow and wet snow.

SECRETARIAT’S COMMENTS

The comments from **France** have merit. In order to better clarify the intent of “operational significance”, the Secretariat proposes the deletion of the word “or” in 2.9.2. However, expanding the remit to include the term “air navigation operations” seems to be excessive in the context of section 2.9 and is not supported.

The terms “wet ice” and “frost” are currently used in Annexes 3 and 6, Part 1 without definitions. The need for definitions will be referred to the multi-disciplinary Friction Task Force.

ACTION PROPOSED

Amend 2.9.2 to read as follows:

2.9.2 The condition of the movement area and the operational status of related facilities shall be monitored and reports on matters of operational significance ~~or~~ affecting aircraft performance ~~given~~ and aerodrome operations shall be provided in order to take appropriate action, particularly in respect of the following:

REFERENCE: Page A-4, Chapter 2, Aerodrome Data, paragraph 2.9.2 c)

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Canada

Disagreement with comments: In part c), the surface conditions "wet ice" and "wet snow on ice" should be deleted as they are already included under the general terms "snow" and "ice". If specific surface conditions were to be listed, then a complete list would have to be included (e.g. dry snow, wet snow, compacted snow, dry snow on ice etc.). The current wording implies that only the specific surface conditions listed are to be reported. In addition, the wording "snow, slush, ice or frost" is consistent with the wording in section 2.9.7.

Germany

The word “wet” has to be shaded.

ICCAIA

This item contains WET SNOW ON ICE. DRY SNOW ON ICE could be as well considered; it is proposed to replace WET SNOW ON ICE by SNOW ON ICE. Item a) to i) could be presented in the following order, Dry, Wet, Contaminated and other factors.

SECRETARIAT’S COMMENTS

The comments from **Canada and ICCAIA** are noted. Considering the intent of the whole of paragraph 2.9.2 is to draw attention to the various types of hazards, including contaminants, on the movement areas, The Secretariat agrees with the comment from Canada to delete “wet ice” and “wet snow on ice”.

With regard to the comment from ICCAIA, it is proposed to insert a new Note 3 referring to the complete list of contaminants that need to be reported which can be found in paragraph 2.9.9.

The comment from **Germany** concerning editorials is noted.

ACTION PROPOSED

Amend 2.9.2 c) to read as follows:

2.9.2 c) snow, slush ~~or~~, ice or frost on a runway, a taxiway or an apron;

...

Note 3. – See 2.9.9 for a list of winter contaminants to be reported.

REFERENCE: Page A-5, Chapter 2, Aerodrome Data, paragraph 2.9.2 *Note 1*

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Germany

It is neither practicable nor does it enhance safety to take into consideration “oil and rubber” on an apron. These references must be deleted.

SECRETARIAT’S COMMENTS

In response to the comment from **Germany**, paragraph 2.9.2 is applicable to the movement area which is not limited to the apron. Definition of “movement” area can be found in Annex 14, Volume I. Presence of oil and rubber on a runway can have a negative impact on safety.

ACTION PROPOSED

No change.

REFERENCE: Page A-4, paragraph 2.9.2 c) and Page A-5, *Note 2*

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Norway**

2.9.2 c): This should be extended to include “dry or wet snow on ice”. In the report AIBN has pointed to the fact that all types of snow on ice will lead to reduced friction.

2.9.2 Note 2: “dry and wet snow on ice”.

SECRETARIAT'S COMMENTS

Concerning the comment from **Norway** on 2.9.2 c), see the Secretariat's response to comments from **Canada and ICCAIA** (page B-12).

Concerning the comment from **Norway** on the *Note 2* to 2.9.2, the Secretariat agrees with the comment.

ACTION PROPOSED

Amend Note 2 to 2.9.2 to read as follows:

Note 2. – Particular attention may be given to the simultaneous presence of snow, slush, ice, wet ice, dry and wet snow on ice with anti-icing or de-icing liquid chemicals.

REFERENCE: Page A-5, paragraph 2.9.3A, page A-6, paragraph 2.9.6, page A-8, paragraph 2.9.8 and Note, page A-10, paragraph 3.1.23

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Belgium**

Too much freedom is left open to the States in all these provisions. The guidance given in the Aerodrome Service Manual (Doc 9137), Part 8, Chapter 7 is not enough. More guidance should be provided to the States.

SECRETARIAT'S COMMENTS

Belgium expressed concerns that the SARPs quoted above leave too much freedom to States. The Secretariat is of the view that, given the current knowledge of the nature of friction-related SARPs and the complexities involved, removing the references to States in the SARPs is not encouraged. The term “*established/specified/set by the State*” places a responsibility on the part of the State to set, specify or

agree to certain provisions. The focus on States' responsibility resulted in the proposed term to positively indicate that a specific action was needed from the State. This is in accord with the *Chicago Convention* where the ultimate responsibility rests with the States. The need for updated guidance is noted and is currently being progressed through the Friction Task Force (FTF) of the Aerodromes Panel as part of the ANC-approved work programme.

ACTION PROPOSED

Request FTF for development of appropriate guidance in Doc 9137 ASM Part 8.

REFERENCE: Page A-5, **Chapter 2, Aerodrome Data**, paragraph 2.9.3A

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Austria

The definition criteria is done by states individually. In order to avoid a lot of different criteria, the use of the associated guidance material should be recommended in a stronger way.

Cyprus Ireland Italy

Proposed recommendation 2.9.3A is part of larger group of changes related to the overall assessment of the runway surface conditions. Although aerodrome operations and maintenance personnel are expected to be trained and competent to perform their duties, so far there was no specific provision in the Annex addressing the issue of personnel assessing and reporting runway surface conditions. The implementation of this recommendation could have an operational and financial impact on aerodromes and is likely to require further actions to be undertaken at regulatory level. However, the safety benefit of having personnel with improved assessment and reporting skills is considered as an additional tool for addressing the overall runway safety issue and in particular the runway excursions (runway overruns and veer-offs), which in turn outweighs any possible additional burden.

Germany

The new recommendation as well as the new proposed *Note* can be summarized in the already existing *Note* to provide more flexibility for the operation of aerodromes.

Germany proposes the following wording:

Note.— Guidance on **personnel assessing, reporting and** carrying out daily inspections of the movement area is given in the Airport Services Manual (Doc 9137), Part 8 and in the Manual of Surface Movement Guidance and Control Systems (SMGCS) (Doc 9476).

IFALPA

Inspections of the movement area is covered by a Standard in 2.9.3, therefore IFALPA believes that personnel carrying out the inspections need to also be covered by a Standard in regards of their training and competency so requests 2.9.3A becomes a Standard.

SECRETARIAT'S COMMENTS

Austria proposed that the use of guidance material should be recommended in a stronger way; **IFALPA** proposed the upgrading of 2.3.9A to a Standard. **Germany**, on the other hand, suggested that the Recommended Practice in 2.3.9A, be downgraded and be included in the existing *Note* in 2.9.3. The objective of developing 2.9.3A serves two purposes. Firstly, it introduces the need for personnel involved in the assessment and reporting of runway surface conditions to possess the necessary skills to ensure the quality and accuracy of information reported for operational and maintenance purposes. This is paramount particularly in the context of the transitory nature of winter conditions. Secondly, quality and accuracy of information becomes increasingly important with the move towards a global reporting format. States must therefore establish the criteria for training of personnel assessing and reporting runway surface condition based on guidance that had already been developed for inclusion in the next update of *Airport Services Manual*, Part 2 — *Pavement Surface Conditions* and Part 8 — *Airport Operational Service*. In response to the comments from Austria and IFALPA, the proposed Recommended Practice in 2.9.3A can be later reviewed after its implementation for upgrading to a Standard. The proposal by Germany negates the importance of the subject and is not supported.

The comments from **Cyprus, Ireland and Italy** support the proposal and are noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-5, paragraph 2.9.3A and page A-8, paragraph 2.9.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Norway**

2.9.3A/2.9.8: Reference is made to the Airport Services manual Doc 9137, Part 2 both here and several other places. AIBN has indicated that this is out of date and has recommended it to be revised and updated.

SECRETARIAT'S COMMENTS

The comment from **Norway** is noted. The updating of Doc 9137, *Airport Services Manual*, Part 2 — *Pavement Surface Conditions*, Fourth Edition, 2002, is part of the work programme of the FTF approved by the ANC. In addition, in order to provide States and all relevant stakeholders with a better understanding of the proposed amendments, Circular 329 *Assessment, Measurement and Reporting of Runway Surface Condition* provides the necessary guidance on this difficult, complex and multifaceted subject.

ACTION PROPOSED

No change.

REFERENCE: Page A-6, paragraph 2.9.4

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Brazil

The descriptions for “standing water” refers to a condition where more than 25 per cent of the runway surface area (whether isolated areas or not) is covered by water more than 3mm deep. The assessment of this condition requests more specificity in order to achieve a standard description related to safety. For instance a portion of 15 per cent in the touch zone is more critical than another portion greater but of small areas on the side of runway. We suggest that should be considered the touch zone as an additional reference to assess the runway surface conditions regarding the presence of water.

Canada

Canada has NPA 2005-34 undergoing regulatory review, which amends CAR 725.55 to include the following definition of a damp runway:

"Damp Runway

(a) A damp runway is considered to be a wet runway

(b) A damp, properly designed, constructed and maintained grooved runway; or a Porous Friction Course (PFC) runway, is considered to be a dry runway.

INFORMATION NOTE: If the term damp runway conflicts with statements in the aeroplane flight manual, then the application of the term that provides the most conservative performance takes precedence."

Disagreement with comments: Therefore, it is recommended that the term “Damp” runway be retained and defined as quoted above.

Disagreement with comments: Standing water on a manoeuvring area is a safety hazard regardless of the coverage area involved. The issue of the 25% is an aircraft operations issue as to when the application of adjustment factors are to be applied.

Final comment: Canada does not support the proposed change and suggests deletion of the 25% from Annex 14.

Cyprus

Ireland

Italy

This proposal is intended to harmonise the existing definitions in Annex 14 with those in Annex 6, Part 1, amendment 33A. Proposed definitions will also contribute to the harmonisation with aircraft certification specifications and, in the future, with the relevant air operations requirements, while they will provide an additional safety benefit coming from the introduction of a practical and applicable reporting system for the condition of runways.

Dominican Republic

(Note.— See appropriate partial language version of this AN-WP for original text.)

In 2.9.4., the term FLOODED could be retained. Although flooding is rare, it does happen, and when it does, the term standing water does not apply. We would like to add STANDING WATER and keep FLOODED.

Germany**Disagreement with comments**

For operational reasons, the deletion of “DAMP” cannot be supported.

Singapore

Singapore notes the change from a qualitative assessment to the use of quantitative criteria to describe runway surface conditions. In this respect, Singapore would like ICAO to provide guidance on the available means to measure water depth on the runway as well as to quantify the percentage of runway surface being covered in water more than 3mm deep.

Sweden**Disagreement with comments**

Our regulations for operation of aircraft will retain DAMP as a description of a runway surface state until further. Consequently there will still exist a need to assess and report the runway surface condition based on the existing criteria for a damp runway and Sweden proposes that the deletion of DAMP is withdrawn. The rationale for keeping DAMP is that it allows for more nuanced aircraft performance calculations, which is essential for the efficiency of operations at some places, while maintaining a proven high safety standard. Consequently we propose not to delete DAMP.

United States

Remove: "STANDING WATER"

Replace with: "WATER"

To ensure consistency with the proposed FAA Takeoff and Landing Performance Assessment (TALPA) Aviation Rulemaking Committee (ARC) definitions, used during the matrix validation effort that has been undertaken at aerodromes over the last two winter operating seasons.

ACI

We do not agree with the deletion of DAMP. The rationale box states: “The term *DAMP* is proposed to be removed following changes to Annex 6, Part 1, Attachment C, Section 2. Definitions, which defines the state of the runway surface as either dry, wet or contaminated. A *DAMP* surface should be considered *WET*”

As we understand it, this change requires that the full performance penalty for a wet runway will be applied in case of a runway which may be only slightly damp.

We request that DAMP be retained:

DAMP — the surface shows a change of colour due to moisture.

IATA

ICAO have clearly defined the three runway conditions as Dry, Wet or Contaminated using the 25% coverage criteria, but IATA recommend that “Damp” should be considered the same as Dry, and not Wet as per the accompanying note (2.9.4).

Further research of runway surface conditions and associated braking conditions is required. It is desirable for this research to be encouraged and promoted in order to find a solution that will result in accurate assessment and reporting of surface conditions and braking.

ICCAIA

"STANDING WATER" has been added. This terminology also appears in PANS ATM, §12.3.1 ATC Phraseology, however not in Annex 15, Appendix 2, SNOWTAM format.

The associated Rationale includes "The term WATER PATCHES is considered to be of no practical value and is proposed for deletion." The terminology COVERED WITH PATCHES OF SNOW is found in PANS ATM, § 12.3.1 ATC Phraseology. The practical value of this terminology is also challenged and proposed for deletion, however, the descriptions PATCHES / PATCHY can be kept for clear text complementary information.

SECRETARIAT’S COMMENTS

Comments from **Cyprus, Ireland and Italy** support the proposed amendment and are noted.

Canada, Germany, Sweden and ACI disagree with the proposed deletion of DAMP. Canada and Sweden quoted their national practices while Germany disagrees due to “operational reasons” and ACI disagrees due to potential performance penalties.

The Secretariat recalled that the main objective of the proposal amendment in Annex 14, Volume I, Chapter 2, was to align existing definitions in Annex 14, Volume I with those in Annex 6, Part 1 as stated in the *Rationale*. Notwithstanding, individual States may have provisions that differ from Annex 6, Part 1, it should be noted that the latter provisions form the basis for global flight operations and on which the proposed amendment has been predicated.

The comments from Canada concerning ongoing proposed amendment to national regulations are noted. In the proposed amendment, a DAMP runway is considered to be a WET runway; when properly designed, constructed and maintained (with grooves or PFC), it is to be considered a DRY runway.

The comment from Sweden concerning the use of DAMP in nuanced aircraft performance calculations is noted but not supported. Performance tables for aeroplanes such as the A320, B-737NG and other models built since have been aligned with the runway surface conditions provisions in Annex 6 Part I.

Concerning ACI’s comment on performance penalty for a slightly damp runway that is considered wet, this is a flight performance issue addressed in Annex 6. *Note 2* to the definition for Runway Surface Condition, Annex 6, Part 1, Attachment C provides examples of such situations. Further, in the context of a dry runway definition, according to the report of the Airplane Performance Harmonization Working Group, “it is not intended to require runways with small isolated damp patches or water puddles in non-critical areas to be considered wet.” Additionally, some States (see comment from Canada above) impose additional requirements for a damp runway to be considered dry.

The comment from **IATA** recommending DAMP to be considered as DRY is inconsistent with the Annex 6, Part 1 definition which defines the latter as one which is clear of, among others, visible moisture. The Secretariat, however, agrees with IATA on the need to conduct further research into runway surface conditions and associated braking actions, a task currently in progress by the FTF.

On the comments from **Brazil, Canada, United States** and **ICCAIA** concerning the use of term STANDING WATER, the thrust of the definition originates from the operation of aircraft. The Secretariat agrees that standing water is a hazard regardless of the coverage; however, it is important to reflect in the reporting format the magnitude of its presence. The proposed wording reflect current operational practice contained in Annex 6, Part 1, where 25 per cent is the threshold as to when the application of adjustment factors is to be applied.

In response to the comment from the **Dominican Republic**, when a runway is flooded, there is a depth of water present on the runway, hence the term STANDING WATER should apply.

The comment from **Singapore** requesting guidance on the available means to measure water depth and percentage of runway surface being covered in water more than 3mm deep is noted. The Secretariat is cognizant that limited guidance is currently available in Doc 9137 Part 2. The multi-disciplinary FTF is tasked with developing further guidance during the current work programme which may include the use of precipitation and/or laser sensors. In this regard, the Secretariat wished to solicit the participation of Singapore which had lately experimented with the use of such devices.

ACTION PROPOSED

No change.

REFERENCE: Page A-6, paragraphs 2.9.5 and 2.9.6

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Canada

Disagreement with comments: Section 2.9.5 and 2.9.6 are essentially defining the same standard that information be made available or notification be issued that a runway may be slippery when wet and/or does not meet the minimum friction level specified by the state. In section 2.9.5, the term "*slippery when wet*" has been deleted from other sections of the document related to runway friction and thus the terminology is not consistent. In addition, there is no indication on what basis a runway is determined to be "*slippery when wet*".

Either section 2.9.5 should be deleted or if retained, then the wording of section 2.9.6 should be revised, similar to as follows:

A paved runway or portion thereof shall be determined as being slippery when wet when the requirements specified in 10.2.3 are not met.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

(2.9.5) The notion of a runway that may be slippery when wet is difficult to understand without reference to a certain context that is not specified in Annex 14. Moreover, the wording creates ambiguity.

Furthermore, the Aerodrome Panel, which proposed to delete 2.9.5, rightly indicates that the minimum friction level specified by the State as introduced in 10.2.3 and included in 2.9.6 makes it possible to move away from the notion of a runway that may be slippery when wet.

We strongly wish to return to the proposal by the Aerodrome Panel to delete 2.9.5.

~~“Information that a runway or portion thereof may be slippery when wet shall be made available.”~~

Furthermore, to retain it would be contradictory to the explanation provided by the Secretariat.

Norway

(2.9.5) In the report AIBN has suggested to remove the expression ”slippery” and replace it by ”medium”, or worse according to criteria for estimated friction. “Slippery” does not define estimated friction.

(2.9.6) Note: Norway has reported difference regarding the ICAO method for determination of MDL and MFL, due to a high degree of uncertainty in this method.

United Arab Emirates

(2.9.6) Based on the climate of the UAE which excludes presence of snow and ice - the UAE would not propose to adopt the change which would rely on runway surface level assessment without the aid of the prescribed CMFE.

ICCAIA

The Aerodromes Panel had proposed the removal of Annex 14, §2.9.5. However, in the State Letter, this paragraph has been left unchanged. This doesn't appear consistent with the amendment of §2.9.6 and the removal of §2.9.7.

SECRETARIAT’S COMMENTS

Canada proposed that paragraph 2.9.5 be deleted or, if retained, the paragraph 2.9.6 should be reworded. **France and Norway** suggest the deletion of 2.9.5 as proposed by the Aerodromes Panel. **ICCAIA** pointed out inconsistencies with other SARPs when retaining 2.9.5.

From a pilot’s perspective, information required by pilots was an assessment of runway surface conditions and estimated braking action. Such data was needed by the pilot when preparing for a flight and before landing and take-off. That being so, the notion of friction measurements should be replaced by the notion of surface condition assessment. The use of devices to measure the friction coefficient was only a part of the means for a total assessment of the runway surface condition; other factors include the determination of the type and percentage of contaminant and the type and texture of the runway surface. Over reliance on friction measurement may divert the focus from assessing the overall runway condition. At worst, friction measurements have been found to be misleading, misused and have proven to be a contributing factor to accidents. Friction measurements therefore remain a tool in the overall assessment process.

The term “slippery when wet” is related to the minimum friction level. It became clear that there has not been a relationship established between the wheel braking and friction measurements used in aircraft performance. Assessing a runway as being slippery when wet is rather difficult and it is insufficient to

make a precise assessment of this on the basis of only a friction measurement. To maintain satisfactory runway friction characteristics, it must be ensured that, inter alia, the surface texture is also satisfactory. The Secretariat therefore agrees with the comments stated above and is of the view that until a better correlation between the ground measuring equipment and aircraft performance has been established, the determination of a runway as being “slippery when wet” should be used with caution. Secretariat proposes amending 2.9.6 including a new Note, as below. With this proposal, 2.9.5 is considered redundant and is proposed to be deleted.

As regards comment from **United Arab Emirates**, the proposed amendment to 2.9.6 does not preclude the use of friction measuring devices as part of the overall runway surface assessment. For States that have developed procedures for runway surface assessment which may include the use of information obtained from friction measuring devices and the reporting of quantitative values, these procedures should be published in the AIP.

ACTION PROPOSED

Delete 2.9.5 and amend 2.9.6 to read as follows:

~~2.9.5 Information that a runway or portion thereof may be slippery when wet shall be made available.~~

2.9.6 A ~~When a paved runway or portion thereof does not meet shall be determined as being slippery when wet when the measurements~~ the requirements specified in 10.2.3, notification that the paved runway or portion thereof may be slippery when wet shall be issued to aerodrome users ~~show that the runway surface friction characteristics as measured by a continuous friction measuring device are below the minimum friction level specified by the State~~

Note 1.— Guidance on conducting a runway surface friction characteristics evaluation programme that includes determining and expressing the minimum friction level is provided in Attachment A, Section 7.

Note 2.— The determination of a runway or portion thereof may be slippery when wet is not based solely on the friction measurement obtained using a continuous friction measuring device. Supplementary tools to undertake this assessment are described in ASM Part 2.

REFERENCE: Page A-6, paragraph 2.9.6, Page A-7 paragraph 2.9.7, Page A-55 paragraphs 10.2.3, 10.2.4 and Note 2, Page A-60 paragraph 6.2, Page A-61 paragraph 6.4, Page A-64, paragraph 7.7, Appendix 2 and 9

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Germany

Disagreement with comments

Germany is of the opinion that the mentioned articles should be worded in a neutral way and should not directly refer to the States as responsible bodies.

The proposed approach of the States setting or agreeing the criteria for friction measurements is not practicable, since local conditions differ and since aerodrome operators use different measuring methods and systems.

To enable aerodrome operators to factor in local circumstances, they should be independent in fulfilling the safety objectives given in Annex 14. Aerodrome operators should make their decisions on the basis of the Aerodrome Service Manual.

The aerodrome is responsible for providing a real time monitoring and reporting system. If the State set or agrees the criteria for friction measurements, the responsibility would then be with the State and not with the aerodrome operator. The State can verify compliance with the requirements for friction measurements as laid down in Annex 14 etc. by means of oversight audits.

Germany proposes the following wording:

2.9.8 ... ~~meet the standard and correlation criteria set or agreed by the State.~~

SECRETARIAT'S COMMENTS

The comment from **Germany** has relevance to the comment from **Belgium** on page B-13.

The Secretariat is of the view that precisely because of the reasons stated by Germany, in addition to the vagaries and complexities of this subject, the focus is now at the State level where operation of aircraft on contaminated surfaces are approved. By removing the term "*set/agreed by the State*", there is a possibility that the importance of the friction-related SARPs is not recognized unless they are *set by the State* or *agreed by the State*. See also Secretariat comments on page B-13.

ACTION PROPOSED

No change.

REFERENCE: Page A-6 and A-7, paragraphs 2.9.5 to 2.9.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

Proposed amendments aim at distinguishing between maintenance and operational assessments and rationalises the use of CFME and assessment and reporting, allowing States a degree of flexibility while reinforcing the message that runway surface friction measurements are primarily for maintenance purposes. In addition, guidance is provided in Attachment A, Section 6 and 7 of the Annex. As with the proposal for harmonised reporting, there is a clear safety benefit, while additional actions may be needed at regulatory level.

Italy

This will be a significant change for aerodrome operators. Recent studies showed that friction measurement under the conditions described in the proposed Recommendation 2.9.7A, (slush, wet snow or wet ice) is not considered to be reliable and therefore not usable by air operators. Moreover, there is no correlation table provided by ICAO between measured friction coefficient and braking action information for those types of contaminants.

SECRETARIAT'S COMMENTS

Comments by **Cyprus, Ireland and Italy** support the proposed amendments and are noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-6, paragraph 2.9.6 and page A-7, paragraph 2.9.7

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**ICCAIA**

In conjunction with our comment on Annex 14, § 2.9.5 above, we are of the opinion that §2.9.6 and §2.9.7 (closely related to §2.9.5) should be left unchanged i.e. no amendment / removal as currently found in the State Letter.

SECRETARIAT'S COMMENTS

ICCAIA disagrees with the proposed amendment in 2.9.6 and 2.9.7. The Secretariat does not support the comment due to reasons stated on page B-20.

ACTION PROPOSED

No change.

REFERENCE: Page A-6, Rationale Box

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**ICCAIA**

In case the friction level falls below the MFL over a significant runway length (maintenance action not possible or delayed) this friction level information should be made available to the pilot. Clarification should be provided on how this information can be reported in the SNOWTAM format.

SECRETARIAT'S COMMENTS

This can be included in section T) of the SNOWTAM format. The Friction Task Force will be tasked with developing the appropriate provisions.

ACTION PROPOSED

Request FTF to develop appropriate provisions.

REFERENCE: Page A-8, paragraphs 2.9.7 to 2.9.9

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium

Reporting should be done by Snowtam. The terms in part F of the (proposed) Snowtam Format as described in Annex 15 Appendix 2 should be similar to the terms of ~ 2.9.9.

Changes in Annex 14 will become applicable on 15 November 2012 and changes in Annex 15 on 14 November 2013. Both amendments should become applicable at the same date because there are many changes on reporting of runway surface condition and runway surface friction that have to be reported through the Snowtam format.

ICAO should also provide more guidance on how to adapt the ATIS systems in order to be in compliance with the new provisions on runway reporting.

Germany

A definition of “frost” is needed.

SECRETARIAT'S COMMENTS

With respect to the comment from **Belgium**, the terms in paragraph 2.9.9 are similar and reportable in the SNOWTAM format. The total number of items in section F) of the SNOWTAM format cannot exceed nine due to the single field allocated. When multiple layers exist on the runway thirds e.g. DRY SNOW ON ICE, it is reported as (using the old format) 47/47/47 in section F. The proposed amendment to Annex 14, Volume I is expected to be made applicable at the same time as Annex 15, planned for 2013. The multi-disciplinary FTF will look into developing further guidance on how to adapt the ATIS systems, as requested.

On the comment from **Germany** concerning the need to define “frost”, see the Secretariat's response on page B-11.

ACTION PROPOSED

Request FTF to develop appropriate guidance on ATIS systems concerning runway reporting.

REFERENCE: Page A-8, paragraph 2.9.7

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Spain

(Note.— See appropriate partial language version of this AN-WP for original text.)

Replace *runway surface friction* with *estimated runway surface friction*, to maintain consistency with SNOWTAM terminology.

ACI

It may be difficult to determine the presence of frost on a coarse textured concrete runway surface. We suggest to add the following note: Note: It is recognized that it may not be possible to determine the presence of frost on coarse textured concrete runway surface.

IATA

While the rationale behind removing the existing paragraph 2.9.7 is sound and understood, there is a concern amongst IATA members that this will indicate no further progress will need to be made in this area. Although the current system was not entirely robust, this does not imply there is no need for such information to be made available to aircrews.

It is accepted that the promulgation of misleading information may have led to a contributory cause of accidents, but the concern is that the removal of all such information may lead to a crew attempting a landing in genuinely bad conditions (which may have been reported under the previous system) with unfortunate consequences.

IFALPA

The wording in 2.9.7 suggests that the only surface conditions that would require an assessment are those in which the contaminant is snow, slush, ice, or frost. A runway surface must be assessed whenever the surface conditions might adversely affect the available friction. IFALPA would recommend rewording as follows:

“2.9.7 – Whenever an operational runway is contaminated by foreign material that could adversely affect surface friction characteristics (i.e., snow, slush, ice, frost, or rubber deposits) the runway surface condition shall be assessed and reported.”

This is consistent with 10.3.1 of this proposal which lists rubber deposits as a contaminant.

SECRETARIAT’S COMMENTS

In response to the comment from **Spain**, the term *runway surface friction* does not occur in paragraph 2.9.7 but in paragraph 2.9.7A. The suggested replacement in 2.9.7A is not supported since the action is on measurement of surface friction.

The proposal from **ACI** is noted and will be referred to the FTF for further study in conjunction with the earlier proposal to develop a definition of “frost” as suggested by Germany.

The comment from **IATA** is noted; however, see Secretariat’s comments on pages B-20 and B-21 and on IFALPA’s comment on page B-143.

The comment from **IFALPA** concerning the inclusion of foreign material such as rubber deposits is noted but not supported for two reasons. Firstly, it is to be noted that the new 2.9.7 falls under the revised topic of “snow, slush, ice or frost on a runway”. The inclusion of other contaminants such as rubber deposit may not be seen to be appropriate in this regard. Secondly, in terms of contaminants directly affecting airplane performance, according to the report of the Airplane Performance Harmonization Working Group, “The dry runway definition is not intended to address contaminants other than snow, slush, water

or ice, such as rubber deposits. That is, the presence of other contaminants, such as rubber deposits, would not require an otherwise dry runway to be considered wet for the purpose of showing compliance with the requirement....". Clearly, precipitation-related contaminants affect aircraft performance and braking action in ways that are different from non-precipitation-related contaminants such as rubber deposits, oil, etc., the latter which are covered in proposed changes to existing 2.9.2 and the Note 1 thereto. Furthermore, contaminants such as rubber take a long time to build up while conditions related to snow, slush, ice or frost may change several times during the course of a day.

ACTION PROPOSED

Request FTF to develop appropriate provisions on the definition, and determination of frost on coarse textured concrete runway surface.

REFERENCE: Page A-8, paragraph 2.9.7A

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Canada

Agreement with comments: In Canada, friction measurements with decelerometers are carried out and reported for runways contaminated with wet ice. Suggest that friction measurements on runways contaminated with loose dry snow exceeding 2.5 cm in depth also not be reported due to unreliable readings in these conditions.

Finland

According to the proposed recommendation, runway surface friction measurements made on a runway that is contaminated by slush, wet snow or wet ice should not be reported. This would mean a significant change to the operators in Finland, and air operators should also be consulted in this issue.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

This recommendation arises from the guidance portion rather than from a recommendation. It explains why, in fact, runway surface friction measurements made on a runway that is contaminated by slush, wet snow or wet ice should not be reported, but in contrast, its status as a recommendation implies that such reports should be provided for the other circumstances. This is far from being the case, however, since the relevance and accuracy of the measured value (problems with the appropriateness of the type of measurement device, calibration problems, implementation problems, etc.) often result in the information provided being questionable, as is underscored by the new version of Section 6 of Supplement A. This is why the Secretariat proposes to give preference to the qualitative Snowtam table and to abandon the quantitative table. The new Section 6 of Appendix A demonstrates this well, in fact.

Thus we propose to delete 2.9.7A

Recommendation. — ~~Runway surface friction measurements made on a runway that is contaminated by slush, wet snow or wet ice should not be reported.~~

~~Note.— Contaminant drag on the equipment's measuring wheel, amongst other factors, may cause readings obtained in these conditions to be unreliable.~~

and to re-insert the note in 6.1 of Attachment A, which would read as follows:

~~“6.1 There is an operational need for reliable and uniform information concerning the friction surface condition of contaminated runways. Contaminant type, distribution and for loose contaminants, depth are assessed for each third of the runway. An indication of surface friction characteristics of ice and snow-covered runways. Accurate and reliable indications of surface friction characteristics is helpful in conducting runway condition assessment. It can be obtained by friction measuring devices; however, further experience is required there is no international consensus on the ability to correlate the results obtained by such equipment directly with aircraft performance, owing.~~

Admittedly, however, for contaminants such as slush, wet snow and wet ice, contaminant drag on the equipment's measuring wheel, amongst other factors, generally causes readings obtained in these conditions to be unreliable.

Norway

2.9.7A: This includes "dry or wet loose snow" and "wet compacted snow". Further on "Measurement should only be performed on dry compacted snow or dry ice".

Russian Federation

(Note.— See appropriate partial language version of this AN-WP for original text.)

The new paragraph 2.9.7 A Recommendation in Annex 14, Volume I be deleted.

Sweden

Disagreement with comments

The changes proposed in the State Letter assumes that it is impossible to provide operationally usable friction information under the described conditions, which is not always the case according to our experience. Furthermore, the proposed change would make it less interesting to develop methods to improve the availability and reliability of friction measurements under critical runway conditions, leaving operators without any support in this respect. We agree that there are reasons to be cautious and the concerns should be conveyed appropriately in guidance material but the Annex should not prohibit proper use of measurements. We suggest that paragraph 2.9.7 is reworded as follows: Whenever an operational runway is contaminated by snow, slush, ice, or frost, the runway surface condition shall be assessed and the friction reported if reliable friction measurement is available. Consequently, paragraph 2.9.7 A should be deleted.

United States

Add: "in amounts greater than 3.18 mm (or .125 inches)" after "slush"

Add: "in amounts greater than 3.18 mm (or .125 inches)" after "wet snow"

Add: "or dry snow in amounts greater than 2.5 cm (or 1.0 inch)"

Remove: "wet ice"

It is often necessary to measure friction values to support aircraft operations. Several equipment manufacturers have developed technology, which has been verified through several years of use in many countries, that is capable of measuring friction under adverse conditions to support aircraft operations.

Add: Runway friction measurements can be reported when compacted snow and/or ice are present on the center portion of the runway and friction values are 40 or below on any zone of the runway.

Since the accuracy of friction measurements are typically not consistent, a logical threshold for reporting would be 40 and below (the actual number be reported). Any value above 40 would be reported as 40+.

ACI

The recommendation should be more specific. We suggest using the following modified text:

2.9.7A Recommendation. —Runway surface friction measurements made on *the portion of* a runway *surface* that is contaminated by slush, wet snow or wet ice should not be reported.

Rationale: The friction measurement is typically on the centre portion of a runway where the conditions can be quite different from the outer portion of the runway and a 60m wide runway should not be subject to a different standard than a 45 m wide runway.

ICCAIA

This paragraph implies that other cases can be reported, for example DRY SNOW, which would need to be considered for inclusion in Annex 14, § 2.9.8.

IFALPA

With regard to 2.9.7A the recommendation should not be limited to slush, wet snow, or wet ice. The note below this paragraph clearly states that contaminant drag may cause unreliable readings. As such, contaminant drag also exists with dry snow and standing water. IFALPA would recommend that this becomes a Standard to ensure flight crews are not given inaccurate information concerning the runway surface and also recommend rewording as follows:

“2.9.7A. – Runway surface friction measurements made on a runway that is contaminated with loose material (i.e., slush, wet/dry snow, wet ice, standing water) shall not be reported.”

SECRETARIAT’S COMMENTS

France, the Russian Federation and Sweden support the deletion of paragraph 2.9.7A. **IFALPA**, on the other hand, suggests this requirement be expanded and upgraded to a Standard.

The comment from **Sweden** concerning that experience in providing operationally usable friction information under the described conditions is noted. Further proposals from **Sweden** to provide alternative texts for 2.9.7 arising from the deletion of 2.9.7A is not supported since the proposed texts preclude the need for reporting the result of the assessment which is a fundamental requirement. In taking note of **Sweden**’s experience, the Secretariat proposes modifying 2.9.7A as shown below. The Secretariat agrees with the proposal from **France** to reaffirm the intent of 2.9.7A by inserting a note to 6.1 of Attachment A, Annex 14, Volume I.

The comments from **Canada, Norway, ICCAIA and IFALPA** extending the remit to include other descriptions of precipitation-related contaminants will be referred to the FTF.

The comment from **United States** which contains prescriptive values seems to be better suited in the guidance material rather than in a performance-based SARP.

The comment from **Finland** is noted.

On the concern raised by **ACI**, the guidance in Attachment A, Annex 14, Volume I, specifies that surface conditions are assessed and promulgated for each third of the runway. This obviates the need to include the term “the portion of” as suggested by **ACI**.

ACTION PROPOSED

Amend paragraph 2.9.7A to read as follows:

2.9.7A Recommendation. — *Runway surface friction measurements made on a runway that is contaminated by slush, wet snow or wet ice should not be reported unless the reliability of the measurement relevant to its operational use can be assured.*

Note .— Contaminant drag on the equipment’s measuring wheel, amongst other factors, may cause readings obtained in these conditions to be unreliable.

Add the following to paragraph 6.1, Attachment A, Annex 14, Volume I:

However, for contaminants such as slush, wet snow and wet ice, contaminant drag on the equipment’s measuring wheel, amongst other factors, may cause readings obtained in these conditions to be unreliable.

REFERENCE: Page A-8, paragraph 2.9.7 to 2.9.9, page A-10, paragraph 3.1.23, page A-11, paragraph 3.3.11, page A-14, paragraph 3.9.15 and Chapters 6 and 7 (pages A-60 to A-66) in Annex 14, Volume I, Attachment A

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Russian Federation

(Note.— See appropriate partial language version of this AN-WP for original text.)

The original paragraphs 2.9.7, 2.9.8, 2.9.9 (new 2.9.7), 3.1.23, 3.3.11, 3.9.15 and Chapters 6 and 7 in Annex 14, Volume I, Attachment A be retained.

SECRETARIAT’S COMMENTS

The comments from the **Russian Federation** are noted; however, no justifications have been provided.

ACTION PROPOSED

No change apart from those that have been modified arising from comments in other sections.

REFERENCE: Page A-8, paragraph 2.9.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Sweden

Disagreement with comments

Good as proposed but retain slush in consequence with our comments on paragraph 2.9.7.

SECRETARIAT'S COMMENTS

The comment from **Sweden** is noted but not supported. The effect of contamination drag due to slush is well documented, therefore, retaining slush would be seen to convey a mistaken notion that it is acceptable to undertake friction measurements on slush. The retention of slush in paragraph 2.9.7A comes with a caveat and it is to be seen as an exception rather than the norm.

ACTION PROPOSED

No change.

REFERENCE: Page A-8, paragraph 2.9.9

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Canada

Disagreement with Comments

WET COMPACTED SNOW. This appears as a new contaminant type which therefore requires an official definition prior to comment from States.

Cyprus

Ireland

Italy

Requiring a wider range of contaminants to be reported enhances the accuracy of the operational information provided and contributes to the harmonisation with other existing reporting formats (such as SNOWTAM).

Italy

Annex 14 already contains information in the definitions about the types of contaminants (mentioned in paragraph 2.9.9) and their possible combination and use. Moreover, for reporting these types of contaminants in the SNOWTAM format, Annex 15, Appendix 2, item F allows the use of combinations of the contaminants mentioned.

Finland

The proposal introduces new terms and combinations of deposit types to be used when reporting runway surface conditions. However, it remains unclear when and how each term should be used. Similarly, it remains open how the new terms relate to condition reporting in accordance with the SNOWTAM format. The recommended use of the new terms in reporting should be clarified.

Sweden**Disagreement with comments**

Add DAMP in consequence with our comments on para 2.9.4.

Switzerland

Here are 12 (!) terms foreseen for the description of the runway surface condition. In order to avoid confusion, especially in winter, further characteristics and details for each term should be added by ICAO.

Comment to 2.9.2, Note 2 to 2.9.2. 2.9.9 and Annex 15, Appendix 2.

The terms should be harmonised.

United StatesRemove:

"WET COMPACTED SNOW"

The term may cause confusion to pilots and aerodrome operators, as this condition and terminology is not used by U.S. airlines and aerodromes. In addition, this runway condition was not used during the FAA TALPA ARC matrix validation effort.

Add:

- DRY SNOW on COMPACTED SNOW
- WET SNOW on COMPACTED SNOW
- WATER on COMPACTED SNOW

Results from the TALPA ARC matrix validation effort indicate that when these conditions were present on an aerodrome (as compared to other conditions) they impacted pilot braking action reports differently. Therefore, it is necessary to delineate the conditions more accurately.

Add definitions (or note the location of the definitions within the text) for all terms.

Definitions ensure clarity and consistency.

ACI

ICE and WET ICE should be added to the definitions in Annex 14. The method of reporting is described the SNOWTAM. The terms in part F of the (proposed) SNOWTAM Format as described in Annex 15 Appendix 2 should be similar to the terms of 2.9.9.

As regards snow, the identification of each level is not visual and needs capabilities in snow structures recognition to be relevant.

Changes in Annex 14 will become applicable on 15 November 2012 and changes in Annex 15 on 14 November 2013. Both amendments should become applicable at the same date because there are many changes in reporting of runway surface condition and runway surface friction that have to be made in the SNOWTAM Format.

IATA

An extra term has been introduced into the descriptions of runway surfaces, wet compacted snow, which has not been covered or defined elsewhere in any of the Annexes. Proposed changes in this section should also consider recommendations from the TALPA ARC.

ICCAIA

The terminology "WET COMPACTED SNOW" is not found in PANS ATM, § 12.3.1 ATC Phraseology and Annex 15, Appendix 2, SNOWTAM format. With a rise of temperature or solar heating, COMPACTED SNOW may turn into WET SNOW or WET SNOW OVER COMPACTED SNOW or WATER OVER COMPACTED SNOW. The terminology WET COMPACTED SNOW should be deleted or otherwise be clarified.

SECRETARIAT'S COMMENTS

Cyprus, Ireland and Italy support the proposed amendment. Additional comments from Italy correctly describe the reporting of contaminants in the SNOWTAM format, including their possible combination and use. As an example, referring to the comments from **Canada, the United States, IATA and ICCAIA**, WET COMPACTED SNOW is a multiple layer contaminant recognised in the SNOWTAM format by the use of code 28 in Item F.

In response to further comments from **Sweden, Switzerland, United States, ACI and ICCAIA**, most of the terms used in paragraph 2.9.9 are already defined in ICAO documents. However, the Secretariat agrees that the terms that are, hitherto, not defined will be tasked to the FTF, taking into consideration the identification of the terms/contaminants and the operational use of the terms in the context of a global reporting format.

ACTION PROPOSED

Request the FTF to consider defining terms used for reporting of winter contaminants that are hitherto not defined.

REFERENCE: Page A-9, paragraph 3.1.22

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Brazil

The statement should provide that the surface of a runway shall be constructed *and maintained* without irregularities.

SECRETARIAT'S COMMENTS

The comment from **Brazil** relates to maintenance and is addressed in paragraph 10.2.2.

ACTION PROPOSED

No change.

REFERENCE: Pages A-9 and A-10, paragraphs 3.1.22 to 3.1.24

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

The amendment to paragraph 3.1.22 is considered as not having any impact on aerodromes or their operation. Paragraph 3.1.23 is understood to be in line with the proposed changes in Chapter 2, as well as Chapter 10 with regard to runway surface friction characteristics, while the case of runway resurfacing, although being self-evident, is now clearly addressed. Moreover, the proposed paragraph 3.1.23A does not seem to have any impact on aerodromes as it is based on the existing paragraph 3.1.24 which is also rephrased accordingly. Generally, the above proposed changes appear to have a clear safety benefit.

SECRETARIAT'S COMMENTS

The collective comments from **Cyprus, Ireland and Italy** on the group of proposed amendments are noted and support the proposed amendment.

ACTION PROPOSED

No change.

REFERENCE: Page A-10, paragraph 3.1.23

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Canada

Disagreement with comments: The use of the word “*resurfaced*” does not capture the timeline between initial construction and subsequent resurfacing. Suggest replacement of the words “*or resurfaced*” with “*and maintained*”. Resurfacing is one method to re-establish desirable friction characteristics.

Germany
Disagreement with comments

See comments on 2.9.8

Germany proposes the following wording:

3.1.23... at or above the minimum friction level set by the State.

ACI

While appreciating that this section is referring to new or improved runways, there may be a need to strengthen it by adding "or maintained" immediately after "resurfaced" so as to capture all the possible circumstances of a runway and also make it consistent with the standard specified in 10.2 and Attachment A 7.5. The paragraph below shows this proposed change:

3.1.23 ~~The surface of a A~~ paved runway shall be so constructed ~~or~~ resurfaced or maintained as to provide good surface friction characteristics ~~when the runway is wet~~ at or above the minimum friction level set by the State.

SECRETARIAT'S COMMENTS

Canada and ACI propose the inclusion of maintenance in paragraph 3.1.23. As stated by ACI, the provisions in Chapter 3 refer to new or improved runways. Provisions governing maintenance is best located in Chapter 10 which is dedicated to the subject. Maintenance is given a high priority with the proposed upgrading of 10.1.1 to a Standard concerning the need for maintenance. The proposed 10.2.3 adequately covers the intent of Canada and ACI.

The comment from **Germany** is addressed in the Secretariat's comment on page B-13 in response to comments from **Belgium**. Additionally, the intent of the proposed amendment is to replace an ambiguous objective with a quantifiable level established by the State. The availability of appropriate guidance material is provided in the *Note* to the following recommendation 3.1.23A.

ACTION PROPOSED

No change.

REFERENCE: Page A-10, paragraphs 3.1.23A and 3.1.24

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

IFALPA

IFALPA believes that the evaluation of a constructed or resurfaced paved runway is essential to determine the surface friction characteristics and that those measurements are achieved by using a continuous friction measuring device with self-wetting features. Therefore IFALPA requests that 3.1.23A and 3.1.24 are both Standards.

SECRETARIAT'S COMMENTS

In response to the comment from **IFALPA**, both Recommendations will be reviewed after their implementation for possible upgrading to a Standard.

ACTION PROPOSED

No change.

REFERENCE: Page A-10, paragraph 3.1.24

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Norway**

3.1.24: Norway has reported difference regarding this procedure and instead measures minimum texture depth (given in millimetres)

SECRETARIAT'S COMMENTS

Comment from **Norway** is noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-10, paragraph 3.1.24 and Note to paragraph 3.1.23

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Switzerland**

Even though in the proposed paragraph 3.1.23A the term "paved" is used, it is missing in paragraph 3.1.24. It should be added to paragraph 2.1.24 to avoid misunderstandings.

SECRETARIAT'S COMMENTS

For continuity with preceding paragraph, the Secretariat agrees with the proposal from **Switzerland**.

ACTION PROPOSED

Amend 3.1.24 to read as follows:

3.1.24 Recommendation.— *Measurements of the surface friction characteristics of a new or resurfaced paved runway should be made with a continuous friction measuring device using self-wetting features in order to assure that the design objectives with respect to its friction characteristics have been achieved.*

REFERENCE: Page A-10, paragraph 3.1.25, Note 1

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The use of adapted materials makes it possible to obtain the required surface friction characteristics without using any special surface treatment.

We propose to delete the following sentence: “~~This normally requires some form of special surface treatment.~~”

and Note 1 then becomes:

Note 1.— Macrottexture and microtexture are taken into consideration in order to provide the required surface friction characteristics. ~~This normally requires some form of special surface treatment.~~ Guidance on surface design is given in Attachment A, Section 8.

SECRETARIAT'S COMMENTS

The Secretariat agrees with the proposal from **France** to delete the sentence referring to surface treatment. The deletion does not materially affect the Note since ample guidance is given in Attachment A, Annex 14, Volume I, as well as in the various manual and in *Circular on Runway Surface Condition Assessment Measuring and Reporting* (Cir 329).

ACTION PROPOSED

Amend the Note to 3.1.25 to read as follows:

Note 1.— Macrottexture and microtexture are taken into consideration in order to provide the required surface friction characteristics. ~~This normally requires some form of special surface treatment.~~ Guidance on surface design is given in Attachment A, Section 8.

REFERENCE: Page A-11, paragraph 3.2.5

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The reader of the unamended 3.2.5 is presented with the objectives and a reference to the ICAO Aerodrome Design Manual.

The Manual, however, introduces other objectives which specify the shoulder widths. The aim is to be able to prevent jet blast erosion and the ingestion of the surface material by the jet engines. These objectives are paramount. In the interest of coherence, improved safety, and of ensuring the suitability of the infrastructure for its true objectives, we propose to add a new recommendation 3.2.6 (as proposed by the Aerodrome Panel), as follows:

3.2.6 – Recommendation: *The surface of a runway shoulder should be so prepared as to resist erosion and prevent the ingestion of the surface material by aeroplane engines.*

Since it is possible for a shoulder or a portion thereof to be unpaved and this possibility should be retained, we also propose adding the following note to 3.2.6:

Note. – Where a runway shoulder or a portion thereof is not paved, additional surface treatment or specific inspections may be necessary, especially for runways that accept operations by 4-engined aircraft.

Germany

3.2.5 has not been changed.

3.2.6 and the following *Note* were introduced by AP/2 and read as follows:

3.2.6 Recommendation: *The surface of a runway shoulder should be so prepared as to resist erosion and prevent the ingestion of the surface material by aeroplane engines.*

Note. — Where a runway shoulder is not paved, additional surface treatment or inspections may be necessary, especially for runways that accept operations by 4-engined aircraft.

Germany can agree to the changes above as proposed by AP/2.

ICCAIA

We have noticed that Annex 14 ~3.2.5 doesn't include any amendment. We were expecting to find instead the new § 3.2.6 as proposed by the Aerodromes Panel.

SECRETARIAT'S COMMENTS

The comments from **France**, **Germany** and **ICCAIA** are noted. However, paragraph 3.2.6 was not part of the original amendment proposal in the State letter and, therefore, should not be considered at this stage. It should also be noted that the Commission has included in the future work programme of the Aerodromes Panel a new task, regarding runway shoulders, asking the panel to consider making paragraph 3.2.6 a Standard, and to determine what could be removed from Annex 14 and placed into the PANS-Aerodromes.

ACTION PROPOSED

No change.

REFERENCE: Page A-11, paragraph 3.2.6 (is not included in the State letter)

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Canada

3.2.6 Recommendation: *The surface of a runway shoulder should be so prepared as to resist erosion and prevent the ingestion of the surface material by aeroplane engines.*

Note. – Where a runway shoulder is not paved, additional surface treatment or inspections may be necessary, especially for runways that accept operations by 4-engined aircraft.

Agree with comments: The above text for 3.2.6 was presented by the ADWG to AP2, 12 - 15 October 2010. AP2 reviewed the proposal and accepted the change. The State letter includes reference to Runway Shoulders on page A-11, but does not include the above proposed change. We question why the results of the international technical experts on the AP and associated working group were not included in the State Letter, considering there was acceptance to proceed at AP2. See extract for AP2 report below:

"1.8.2 The proposed amendment on runway shoulders by the ADWG were reviewed by the meeting and agreed to without comment. The proposed amendment is shown in Appendix E to the report on this agenda item."

SECRETARIAT'S COMMENTS

The comment from **Canada** is noted. See the Secretariat's comments above under the reference of page A 11, paragraph 3.2.5.

ACTION PROPOSED

No change.

REFERENCE: Page A-11, paragraph 3.3.11

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Brazil

Disagreement with comments

The recommendation related to the surface friction characteristics of the runway turn pad uses the expression "suitable", which sounds very imprecise and can lead to different interpretation. We suggest that should be provided surface friction characteristics for the runway turn pad within the acceptable level defined by the State.

Canada

Disagreement with comments: The use of the word “resurfaced” does not capture the timeline between initial construction and subsequent resurfacing. Suggest replacement of the words “or resurfaced” with “and maintained”. Resurfacing is one method to re-establish desirable friction characteristics.

**Cyprus
Ireland
Italy**

Now addressed is the case of resurfacing of runway turn pads. However, further guidance material on the application of this provision might be needed, in order to avoid interpretation difficulties of the proposed word “suitable”, given also the content of paragraph 3.2 of the Aerodrome Design Manual, Part 1, Appendix 4, which currently provides that “... *the surface of a runway turn pad should be so constructed as to provide good friction characteristics for aeroplanes using the facility when the surface is wet...*”.

United States

The text should emphasize the pavement's ability to support aircraft, not the surface friction characteristics.

Operations on turn pads (runway ends) are typically no or low speed. Friction is not an issue.

ACI

We suggest to clarify the word suitable by adding reference to the associated runway.

3.3.11 Recommendation— The surface of a runway turn pad should be so constructed or resurfaced as to provide good suitable surface friction characteristics similar to those of the associated runway. ~~for aeroplanes using the facility when the surface is wet.~~

SECRETARIAT’S COMMENTS

Comments from **Brazil, Cyprus, Ireland, Italy and ACI** involve the interpretation of the word “suitable”. The turn pad should have surface friction characteristics that are comparable to those of the runway so as to avoid differential braking (e.g. in cases of excursion), besides providing a good tire/pavement interaction. In this context, the Secretariat agrees with the proposal from ACI but with slight modifications as per current texts in section 3.3, Annex 14, Volume I.

The comment from **Canada** is addressed in the Secretariat’s response on page B-34.

Referring to the comments from the **United States**, strength of turn pad is already addressed in paragraph 3.3.9. The Secretariat does not agree that friction is not an issue at low speeds. At turn pad, friction is needed for traction when turning and substandard surface friction characteristics may impair safety. In the event of a possible runway excursion, the surface friction characteristics on the turn pad might have a bearing on the severity of the excursion.

ACTION PROPOSED

Amend 3.3.11 to read as follows:

3.3.11 Recommendation.— *The surface of a runway turn pad should be so constructed or resurfaced as to provide good surface friction characteristics at least equal to that of the adjoining runway. for aeroplanes using the facility when the surface is wet.*

REFERENCE: Page A-11, paragraph 3.3.11 and Page A-14, paragraph 3.7.4

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Singapore

Singapore would like to highlight that as the runway turn pad and stopway are located at/near the end of a runway, existing runway surface friction testing equipment may not be able to accurately measure the surface friction of the runway turn pad and stopway, given that a certain distance is required for the surface friction testing equipment to reach the required speed and to subsequently come to a stop safely. Singapore would thus like to enquire if there are alternative means to demonstrate compliance with paragraphs 3.3.11 and 3.7.4.

SECRETARIAT'S COMMENTS

Comment from **Singapore** is noted. With regards to friction measurement at the extremities of the runway, some States allow a certain amount of flexibility, in the interest of occupational safety to permit commencement or termination at a prescribed distance from either the threshold or the physical runway end. The Secretariat is aware that one State commences friction measurement at a distance of 150 m when conducting friction measurement at speed of 65 km/hr and double that distance for speed of 95 km/hr. In another State, to allow for adequate distance for test vehicle acceleration and deceleration, the regulator has mandated that friction measurement should begin at a distance of 200 m from the runway threshold end and terminate approximately 200 m from the opposite end of the runway. In extreme cases, some airports in Nordic States have found it expedient to reduce the speed requirement during particularly slippery conditions during winter. Some self-contained friction testers are able to measure at a high speed close to the ends of the runway in addition to measuring in curves. The practices of these States, and others, including the industry, will be investigated by the FTF for possible inclusion guidance material.

ACTION PROPOSED

Request the FTF to develop appropriate guidance on friction measurement at extremities of pavements.

REFERENCE: Page A-11, 3.4 Runway strips

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Obstacles are discussed in Chapter 4, and the specifications relating to objects situated on runway strips (3.4.6 and 3.4.7) should be included therein since they are considered to be obstacles.

United States**Add:**

Figure x: Basic Runway Strip

A diagram of a basic runway strip should be provided.

Figures and diagrams provide clarity and help to show how related design features work together.

SECRETARIAT’S COMMENTS

The comment from **France** is noted. However, the issue raised was not part of the original amendment proposal as in the State letter and, therefore, should not be considered at this stage. The comment from the **United States** is noted. Again, the subject was not part of the original amendment proposal as in the State letter and, therefore, should not be considered at this stage. It should also be noted that a Figure A-4 is included in Attachment A to Annex 14, Volume I depicting the graded portion of a strip including a precision approach runway where the code number is 3 or 4.

ACTION PROPOSED

No change.

REFERENCE: Page A-12, paragraph 3.4.7 and the Rationale Box

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS**Belgium**

Guidance should be given about what means "objects that are required for aircraft safety". Examples could be given.

Cyprus**Ireland****Italy**

Paragraph 3.4.7 clarifies that under certain conditions, additional objects may be situated on a runway strip. This change has a clear safety benefit, because under the existing provisions no object other than those intended for air navigation purposes could be installed on a runway strip. However, since the aim is *“to allow the installation of arresting systems which are frangible and intended to enhance safety in the event of an aircraft overrun”*, it might be appropriate to clearly mention this intent in the proposed amendment. In this case, the areas of installation of such objects on the strips seem also to be more limited in scope.

Germany

Germany agrees with the changes to 3.4.7 and the rationale.

The word “frangibility” versus “arresting system” in the rationale has to be reviewed.

United Arab Emirates

UAE would not want to adopt wording as general as "object ... required for aircraft safety purposes" as this could potentially also apply to fixed electronic equipment located in the strip which is related to aircraft safety systems. It is recommended to include the specific objects that are allowed (i.e. RVR reporting equipment, etc), provide specific exclusions such as fixed electrical equipment and/or insert the word "directly" (or similar) and consider addition of a supporting note.

We also please request a definitive list of items that would be considered for "aircraft safety purposes."

ACI

Rationale Box. By the nature of its performance requirements, an arresting system is not frangible.

SECRETARIAT'S COMMENTS

The comments from **Belgium, Cyprus, Germany, Ireland and Italy, and United Arab Emirates** are noted. **Germany** supports the proposed amendment. The major concerns of the other States mainly relate to the use of the generic term "objects required for aircraft safety purposes". This term has been discussed at some length during the preliminary review by the Commission and was endorsed based on the fact that, not only an arresting system could be sited on the runway strip but also other devices, such as a foreign object debris (FOD) detecting system, for the purposes of aircraft safety. Therefore, the Secretariat considers it appropriate to keep this generic term, noting that the relevant frangibility requirement still exists in the Standard, which prevents objects from presenting a major hazard to aircraft. The comments from **Germany** and **ACI** regarding "frangibility" versus "arresting system" are noted. An arresting system with demonstrated performance should not endanger an aircraft and, therefore, should be considered frangible.

ACTION PROPOSED

No change.

REFERENCE: Page A-12, paragraph 3.4.11

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

This specification is not clear. It appears to contain two notions. The first relates to the irregularities in this part of the runway strip and the second to blast erosion. The irregularities are, in fact, handled by recommendation 3.4.8 concerning grading of runway strips. Thus, here, the 30 m of runway strip before a threshold should be treated as a shoulder and have the equivalent objectives (see the comments concerning shoulders). We propose:

3.4.11 Recommendation.— *That portion of a strip ~~to at least 30 m~~ before a threshold should be prepared against blast erosion and in order to prevent the ingestion of any surface material by the*

aeroplane engines during landing, in order to protect a landing aeroplane from the danger of an exposed edge, to a distance of at least 30m.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. However, paragraph 3.4.11 was the existing text and not part of the original amendment proposal as in the State letter and, therefore, any change to it should not be considered at this stage.

ACTION PROPOSED

No change.

REFERENCE: Page A-12, paragraph 3.4.12

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

The recommendation provides an obvious safety benefit, although there might also be a limited impact in cases where a paved surface is already provided, but its strength does not allow the occasional passage of critical aircraft. However, the overall safety benefit is considered to justify the proposal.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

We understand the objective of having a blast pad that meets shoulder requirements. However, for occasional taxiing, the distance to at least 30 metres seems excessive. We understand that the case of an undershot landing is handled by the RESA and the entire portion of the strip at the end of the runway. Additionally, 3.4.12 covers the case of an aeroplane in the course of alignment, which would correspond to a taxiway shoulder, given that the aeroplane is taxiing (not taking off or landing). The width of the taxiway shoulder depends, in fact, on the aerodrome code, which varies from 30m to 12.5m starting from the taxiway centre line. We propose using these values for the occasional passage only. Indeed, we understand that 3.4.11 also covers cases in which the aircraft is at a low height above this area during landings and cases in which the aircraft powers the engines up to full power for take-off (specific cases which go beyond the scope of the taxiway shoulders).

We propose:

3.4.12 Recommendation. – Where the areas in 3.4.11 have paved surfaces, they should be able to withstand the occasional passage of the critical aeroplane for runway pavement design at a distance, starting from the markings allowing the aircraft to align with the runway centre line, of at least:

- 30m when the code letter is F;
- 22m when the code letter is E;
- 19m when the code letter is D;
- 12.5m when the code letter is C.

Note.—The area adjacent to the end of a runway may be referred to as a blast pad.

[Translator's note: The other changes in the French version concern 1) the above-mentioned distinction between “piste en dur” and “piste revêtue” and 2) a simple revision error, neither of which has an effect on the English text.]

Germany

Disagreement with comments

Operation on a strip is not the purpose of a strip and is not appropriate. It must be clear whether a paved portion of a strip can be used as an area for operation. This recommendation can be misleading. Therefore, Germany recommends to delete the recommendation.

Switzerland

As "blast pad" is not used in the ICAO terminology by now, it should be defined under 1.1 in the Annex 14, Vol. I.

In this paragraph strength requirements are mixed with blast erosion criteria. The requirements regarding strengths of runway strips are already defined in paragraph 3.4.16 and 3.4.17.

ACI

The proposed new recommendation may lead to confusion as regards the expected performance and specifications of the blast pad pavement. Therefore, we suggest integrating in the recommendation

Recommendation.— *Where the areas in 3.4.11 have paved surfaces, they should be able to withstand the occasional passage of the critical aeroplane for runway pavement design. Their strength specifications should be consistent with those of runway shoulders.*

SECRETARIAT'S COMMENTS

Cyprus, Ireland and Italy support the proposal in principle. **France** proposes new figures for the length of a blast pad with the pavement strength to withstand the occasional passage of an aircraft based on code letters. However, the Secretariat considers that a blast pad at the end of a runway is different from a taxiway shoulder and that it is appropriate for a 30 m long blast pad to have a consistent pavement strength. The comment from **Germany** is noted. However, the rationale behind the proposed amendment takes into account lessons learned from aircraft accidents/incidents, where, in reality, occasional passage of aircraft over a blast pad does happen and, therefore, the strength requirement is necessary for the sake of safety. The comments from **Switzerland** are noted. The term “blast pad” is explained in the note under paragraph 3.4.12, and the Secretariat considers it appropriate before a further study is conducted as to whether a formal definition is needed. As regards the second comment from Switzerland concerning strength requirements, it should be noted that the strength requirement in paragraph 3.4.12 is specific to a paved surface, which is different from that for blast erosion and for a runway strip in general. The proposed change from **ACI** is noted. It should be noted that guidance material on the treatment of shoulders and blast pads is available in the Aerodrome Design Manual, Part 2, where nuances still exist between shoulders and blast pads. Therefore, the Secretariat prefers the wording in the original proposed amendment.

ACTION PROPOSED

Request the AP to study whether a formal definition of “blast pad” is needed.

REFERENCE: Page A-12, 3.5 Runway end safety area

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

United States

Add: Figure x: Basic Runway End Safety Area

A diagram of a basic runway end safety area should be provided. Figures and diagrams provide clarity and help to show how related design features work together.

SECRETARIAT'S COMMENTS

The comment from the **United States** is noted. However, the subject raised was not part of the original amendment proposal as in the State letter and, therefore, should not be considered at this stage.

ACTION PROPOSED

No change.

REFERENCE: Page A-13, Section 3.5 Runway End Safety Areas

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

IATA

The changes proposed here are to be commended.

SECRETARIAT'S COMMENTS

The comment from **IATA** commending the amendment proposal is noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-13, paragraphs 3.5.2 to 3.5.5

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

Paragraph 3.5.2 in conjunction with the provision in paragraph 3.5.4 (c) may have a varying impact on aerodromes, which however is considered to be outweighed by the clear safety benefit associated by the introduction of the particular design feature. Moreover, the introduction of paragraph 3.5.5, which is applicable in the case of paragraphs 3.5.4 (a) and (b), is considered to be a significantly positive change, as it provides the necessary flexibility to introduce alternative solutions and to reduce the length of the RESA, through the use of an arresting system of demonstrated performance, while additional information on the use of such arresting systems is provided in Attachment A Section 9.

Russian Federation

(Note.— See appropriate partial language version of this AN-WP for original text.)

Runway end safety areas are not used. Their functions are carried out by landing strips located beyond the ends of the runway.

SECRETARIAT'S COMMENTS

Cyprus, Ireland and Italy support the amendment proposal in principle. The comment from the **Russian Federation** is noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-13, paragraph 3.5.2, 3.5.4 and 3.5.5

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Switzerland

It is not very clear why non-instrument runways and instrument runway should be that much distinguished in the application and the dimensions of a RESA for code number 1 and 2 runways. ICAO argues the landing dispersion for non-instrument runways justifies a recommended RESA, which can be recognized, but in fact there are other and in our view more important parameters, which should be considered for the application of a RESA. Some of them are listed in the proposed Attachment D, but the basic considerations are: what are the approach speeds (any limitation may be?) and the masses of the aircraft which have to stop before the end of the runway? This constitutes the kinetic energy which needs to be reduced to an acceptable level of safety. Other important items to consider are: do night operations take place? What are the operational minima for that runway? Is the runway grooved resp. does the runway have enough transversal slope for the evacuation Of the water? Knowing these parameters would make a difference because pilots would be able to see the whole runway environment in some cases (day

ops, enough VIS) and would be able to take corrective action, e.g. a go around procedure. Another aspect is that during night time, crews are not able to identify the runway end the environment, which could justify other RESA criteria.

Finally what is the position of ICAO regarding "take-off runways"? The instrument and non-instrument distinction only applies to the approaches, but in case of a take-off abortion, the mass is (much) higher than the one during landing phase. Moreover the runway code number relies on the MOTM of an aircraft, which is a parameter linked to the take-off run!

Therefore ICAO should review the criteria distinguishing the need for RESA, especially those proposed for code number 1 and 2 and give guidance for take-off runways.

Comment to 3.5.5

This paragraph is not written as a standard and refers to both a Standard and a Recommendation, which seems not consistent. We suggest altering this paragraph into a Note and referring only to the Recommendation 3.5.4 and not to the Standard 3.5.3.

SECRETARIAT'S COMMENTS

The comment from **Switzerland** regarding paragraphs 3.5.2 and 3.5.4 is noted. The proposed new requirement for the provision of RESA for code numbers 1 or 2 non-instrument runways is a safety enhancement as there is no such requirement at present. The dimension of 30 m of the RESA was proposed based on the current practices in several States. It is a starting point pending the availability of future studies. The parameters as mentioned by Switzerland that could be considered for the application of a RESA are noted. Since the subject on RESA remains in the future work programme of the Aerodromes panel, as decided by the Commission, those parameters can be looked into in the next phase of the work.

The comment from Switzerland on paragraph 3.5.5 is noted. See action proposed under Reference: Page A-13, paragraph 3.5.5.

ACTION PROPOSED

No change.

REFERENCE: Page A-13, paragraphs 3.5.3 and 3.5.4

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

IFALPA

IFALPA believes that it is not necessary to determine whether the runway is an instrument one or not and therefore would recommend deletion of the code numbers in 3.5.3. However, IFALPA would prefer that 3.5.4 become the Standard and delete c) and the reference to the runway being an instrument one in b).

SECRETARIAT'S COMMENTS

The suggestion from **IFALPA** would result in more demanding requirements for the dimensions of RESA (i.e. as a Standard, 240 m for code number 3 or 4 and 120 m for code numbers 1 or 2). It should be recalled that this was debated at length without consensus during various meetings in the preliminary review by the Commission and that it was not considered practicable to do so.

ACTION PROPOSED

No change.

REFERENCE: Page A-13, paragraph 3.5.4

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Bosnia and Herzegovina

In part, Dimensions of runway end safety areas (RESA) at point 3.5.4. Recommendation, we consider that shall remain this part: "as far as practicable" to not delete, by reason of many airports with code number 4 has not enough space for renewal by RESA (for 240 m).

Germany

Disagreement with comments

Germany objects to the deletion of "as far as practicable". For the purpose of flexibility, it is very important to maintain this wording.

Germany fully supports the results of AP/2.

United Kingdom

The United Kingdom does not support the removal of the wording "as far as practicable" as this recommendation extends the RP to new categories of runway; as such some flexibility should be accepted by the aerodrome and member state, using a risk-based approach. Additionally, it should be noted that these words were agreed by the Aerodromes Panel at the AP2 meeting in 2010.

SECRETARIAT'S COMMENTS

The comments from **Bosnia and Herzegovina**, **Germany** and the **United Kingdom** suggest retention of the term "as far as practicable" for the sake of flexibility. Since the provision of RESA is a safety-critical issue in the context of mitigating runway excursion consequences and given that a new paragraph is proposed to introduce an arresting system, which is based on paragraph 3.5.4 and which may lead to reduction of the length of a RESA, the Secretariat agrees that the term "as far as practicable" should be deleted.

ACTION PROPOSED

No change.

REFERENCE: Page A-13, paragraph 3.5.5

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium

3.5.5 is written as a standard, and refers to a standard 3.5.3 and at the same time to the recommendation 3.5.4. This seems inconsistent. This could be solved by writing 3.5.5 as a note.

Canada

Disagreement with comments: The use of the words “demonstrated performance” is problematic when assessed against the revised definition of RESA. Specifically with respect “*to allow an aeroplane...undershooting to continue its approach or landing*”. We are not aware of any type of arresting system that has demonstrated this specifically.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

As drafted, it would be impossible to reduce the runway end safety area and to install in its place an arresting system, since the level of protection provided by the runway end safety area is entirely unknown. The level of protection is not defined, and it is difficult to understand what is meant here. Moreover, even if we suppose that the level of protection is defined by deceleration or arresting capacity, it is impossible to know this capacity for any given runway end safety area. Furthermore, it would not be possible to find the level of protection of the runway end safety area. For certain arresting systems, however, this arresting capacity can be determined by calculations. Thus it suffices to ensure that this capacity corresponds to the aircraft accepted at the aerodrome and to the operational conditions. Furthermore, the expression “ensure a level of protection at least equivalent to the prescribed runway end safety area” is not suitable and may render conformity with this specification impossible in practical terms.

We propose:

3.5.5 Notwithstanding the provisions in 3.5.3 and 3.5.4 a) and b), the length of a runway end safety area may be reduced where an arresting system is installed ~~with demonstrated performance that provides a level of protection at least equivalent to the prescribed runway end safety area~~ that has been demonstrated to meet the requirement for deceleration, in the event of a longitudinal runway excursion, of the aircraft for which the runway is intended.

Germany

Disagreement with comments

Germany cannot agree with the new standard. For systematic and practical reasons, a standard can only refer to a standard; therefore, the reference to the recommendation of 3.5.4 should be removed from 3.5.5.

Germany fully supports the results of AP/2.

If the new standard of 3.5.5 is introduced, the recommendation of 3.5.4 could be perceived as a standard, which was not intended.

Furthermore, Germany is unable to comply with the new standard of 3.5.5.

Japan

New 3.5.5 should be applied as STANDARD only to 90m RESA (new 3.5.3 refers) since the provisions of 240m and 120m RESA (new 3.5.4 a) and 3.5.4 b) refer) are RECOMMENDATIONS while that of 90m RESA is STANDARD. Therefore, the provision in 3.5.5 for 3.5.4 a) and b) should be RECOMMENDATIONS.

Republic of Korea

The provision 3.5.5 states that the length of a runway end safety area may be reduced where an arresting system is installed with demonstrated performance that provides a level of protection at least equivalent to the prescribed runway end safety area.

However, the Republic of Korea is concerned about whether or not the reduced length of a runway end safety area will be appropriate for an aircraft to be operated safely.

To be sure, it would be desirable if ICAO clarifies the provision more in detail. For example this provision does not set a clear standard on how much reduction can be made in the distance of the runway end safety area when installing any arresting systems.

Singapore

Singapore would like to highlight that paragraph 3.5.5 is written neither as a Standard or an RP. Accordingly, Singapore would like to seek clarification on whether paragraph 3.5.5 should remain as a SARP.

United States

Add: "a) An available option for improving RESAs is the use of Engineered Material Arresting Systems, or EMAS.

Alternative RESA improvement options, such as EMAS, are not mentioned until Attachment A (Section 9). It would be helpful for readers to see a reference to these options in the main body of the document (i.e. Paragraph 3.5).

ACI

We suggest deletion of the reference to 3.5.4 as follows, because 3.5.4 is a recommendation, and can therefore already be reduced without an arresting system.

3.5.5 Notwithstanding the provisions in 3.5.3 ~~and 3.5.4 a) and b)~~, the length of a runway end safety area may be reduced where an arresting system is installed with demonstrated performance that provides a level of protection at least equivalent to the prescribed runway end safety area.

SECRETARIAT'S COMMENTS

The comment from **Canada** expresses some concerns over the use of the term “demonstrated performance” in relation to the proposed new definition of RESA. In this context, the Secretariat has suggested retention of the existing definition of RESA (see action proposed under the Reference of Page A-2, 1.1 Definition of RESA), and believes that this will resolve the above concerns. The comments from **France** and the **Republic of Korea** mainly relate to how to determine the level of protection of a RESA and the distance of reduction of it when an arresting system is installed. It is reasonable to assume that it

would be difficult to precisely determine the above. However, the Secretariat believes that for an arresting system with predictable and demonstrated performance (e.g. EMAS) it is possible to correlate the arresting system with certain length of RESA using the design specifications of the arresting system. The comments from **Belgium, Germany, Japan, Singapore** and **ACI** question about the appropriateness of paragraph 3.5.5, the way it is written (without “shall” or “should”) and the consistency of using paragraph 3.5.5 to modify both paragraphs 3.5.3 (Standard) and 3.5.4 (Recommendation). Some suggest changing paragraph 3.5.5 to a Note. Regarding the way paragraph 3.5.5 is written, it should be noted that there is a precedent in Annex 14, Volume I (see paragraph 5.3.4.32) where a Standard modifies another Standard using the word “may”. It should also be noted that a Note cannot modify a Standard or a Recommendation. However, the Secretariat supports the notion that it might be inconsistent to use one Standard to modify both a Standard and a Recommendation and therefore, proposes that a separate Recommendation be added to modify paragraph 3.5.4 without changing the substance of the original proposal. The comment from the **United States** is noted. The generic term “arresting system” was preferred over any other specific terms both in the panel meeting and during the preliminary review by the Commission.

ACTION PROPOSED

Amend paragraph 3.5.5 and *add* new paragraph 3.5.6 to read as follows:

3.5.5 Notwithstanding the provisions in 3.5.3, the length of a runway end safety area may be reduced where an arresting system is installed with demonstrated performance that provides a level of protection at least equivalent to the prescribed runway end safety area.

3.5.6 Recommendation. - Notwithstanding the provisions in 3.5. 4 a) and b), the length of a runway end safety area may be reduced where an arresting system is installed with demonstrated performance that provides a level of protection at least equivalent to the prescribed runway end safety area.

Note. – Guidance on arresting systems is given in Attachment A, Section 9.

3.5.47 The width of a runway end safety area shall be at least twice that of the associated runway.

Editorial Note.— Re-number subsequent paragraphs accordingly.

REFERENCE: Page A-14, paragraph 3.7.4

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Brazil

Disagreement with comments

The surface friction characteristics of the stopway should be related to the acceptable level defined by the State of runway.

Canada

Disagreement with comments: The use of the word “*resurfaced*” does not capture the timeline between initial construction and subsequent resurfacing. Suggest replacement of the words “*or resurfaced*” with “and maintained”. Resurfacing is one method to re-establish desirable friction characteristics.

Cyprus
Ireland
Italy

Elimination of the existing differentiation between pavements of stopways is considered as a safety enhancement.

ACI

Because of its limited length, it is not feasible to measure the surface friction characteristics of stopways after construction using conventional friction measuring techniques.

3.7.4 ~~Recommendation.~~— The surface of a paved stopway ~~should~~ shall be so constructed ~~or resurfaced~~ as to provide ~~a good coefficient of surface friction characteristics to be compatible with that~~ at or above those as close as possible to those of the associated runway ~~when the stopway is wet.~~

SECRETARIAT’S COMMENTS

Regarding the comment from **Brazil**, the rationale behind the proposed text is that the stopway might be part of the available distance which the aircraft performance calculations are based upon. Given this scenario, surface friction characteristics become important when transitioning from a runway to a stopway. The criteria for the minimum friction level (MFL) of the runway are set by the State.

The comment from **Canada** is best addressed in Chapter 10, Annex 14, Volume I dealing with maintenance.

Comments from **Cyprus, Ireland and Italy** support the proposed amendment.

Comment from **ACI** is noted. In the interest of safety, it is important that the surface friction characteristic of the stopway is not less than that of the associated runway. The amendment proposed herein involves design requirements. However, practicalities and difficulties of measuring surface friction at extremities of runway, as highlighted by ACI, are valid and will be addressed by the FTF. See also Secretariat’s views on page B-40 in response to the comment from Singapore.

ACTION PROPOSED

No change.

REFERENCE: Page A-14, paragraph 3.7.4, 3.9.11 and 3.3.11

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Switzerland

The term "paved" should be used rasp. not deleted to provide a harmonised terminology in accordance with paragraph 3.1.23.

SECRETARIAT'S COMMENTS

The comment from **Switzerland** is noted but not supported. With the proposed deletion of 3.7.5 concerning unpaved stopway, 3.7.4, as amended, is equally applicable to both pave and unpaved stopway. (3.9.11 is not part of the amendment proposal in the State letter and should not be considered at this stage. 3.3.11 has already been discussed on page B-40.)

ACTION PROPOSED

No change.

REFERENCE: Page A-14, paragraph 3.9.15

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Canada

Disagreement with comments: The use of the word "resurfaced" does not capture the timeline between initial construction and subsequent resurfacing. Suggest replacement of the words "or resurfaced" with "and maintained". Resurfacing is one method to re-establish desirable friction characteristics.

Italy

Surface of taxiways (3.9.15)

Further guidance material on the application of this provision might be needed, in order to avoid interpretation difficulties of the word "suitable" given also the content of the Aerodrome Design Manual, Part 2, which in several paragraphs refers to "good" surface friction characteristics of taxiways.

Republic of Korea

I would like to mention the provision 3.9.15 which states that the surface of a taxiway should be so constructed or resurfaced as to provide suitable surface friction characteristics. In this section the work "suitable" is very ambiguous. Therefore, I would like to suggest ICAO to elaborate these provisions more clearly.

ACI

Criteria for surface friction characteristics that apply to runway pavements are not necessarily applicable to taxiway pavements where aircraft are moving at much slower speeds. Also, suitable" is an ambiguous word in this paragraph. We recommend defining "suitable" to eliminate ambiguity.

SECRETARIAT'S COMMENTS

The comment from **Canada** is noted and is best addressed in Chapter 10, Annex 14, Volume I dealing with maintenance.

The comment from **Italy** is noted. In addition to the clarification provided by the proposed new Note (see below), guidance material will be developed in Doc 9157, *Aerodrome Design Manual, Part 2*.

Comments from **Republic of Korea** and **ACI** concerning the use of the word “suitable” are noted. Taxi speeds at parallel taxiways are, in general, slower than at runways; however, they can be considerably higher at rapid exit taxiways in order to reduce runway occupancy times. The Secretariat proposes adding a *Note* to clarify the intent.

ACTION PROPOSED

Add Note to paragraph 3.9.15 to read as follows:

Note. - Suitable surface friction characteristics are those surface properties required on taxiways to ensure safe operation of aeroplanes at required taxi speeds.

REFERENCE: Page A-15, Chapter 5 - Visual Aids for Navigation

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

IATA

The changes proposed here are again to be commended.

It is hoped that these proposals are followed and promoted in locations around the world where the main risk lies and is seen to be required.

SECRETARIAT’S COMMENTS

The comment from **IATA** is noted and supported.

ACTION PROPOSED

No change.

REFERENCE: Page A-15, paragraphs 5.2.8.5 and 5.2.8.9 and Figure 5-7

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Cyprus
Ireland
Italy

New extension of the enhanced taxiway centreline (47m instead of 45m due to mathematical errors) is proposed, as well as more details on its location. Proposed amendments do not affect the meaning of the provision.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The term “provided” is imprecise here, because the text may also refer to marking that does not yet exist. Additionally, the term “at” appears to indicate that the enhanced centre line marking extends all the way to the edge of the runway, which is not the case. We propose the following language:

5.2.8.5 Where ~~provided~~, enhanced taxiway centre line marking ~~shall be~~ installed, it shall be installed at ~~for all each~~ taxiway/runway intersection.

[Translator’s note: the translation of the French proposal into English has the effect of introducing a redundant style into the English (i.e. by using the word “installed” twice (the French replaces the second “installed” with “le”). It could be useful to replace the second “installed” with “provided” in the English text, because this preserves the meaning, does not contradict France’s comment, and eliminates any redundancy.]The language of this standard is very complex and should be reviewed in order to be made very clear.

Additionally, certain points in this specification do not correspond precisely to the indications in the figures. In fact:

- In (1) of 5.2.8.9, a distance of up to 47m is indicated, whereas the French version of figure 5-7 (a), to which it refers, indicates a distance of 47m $\pm$ 1m.
- Paragraph (2) of 5.2.8.9 specifies that, in the case when the distance between the two markings of the runway-holding position is less than 47m, the marking shall continue beyond the second runway-holding position marking for at least 3 dashed line segments or 47m from start to finish; as written, this would mean that the centre line marking continues on for 47m, which does not correspond to the drawing, which takes into account only the 3 dashed line segments. Furthermore, this would not be consistent with figure 5-7. We assume that the enhanced taxiway centre line marking extends past the runway-holding position marking by at least three dashed line segments, and if the extension is by more than three dashed line segments, then the total length of this centre line marking (that is, the distance between holding-point markings plus the length of the extension) is 47m (assuming that there may be $\pm$ 1m). If we have understood correctly, we would propose the following: (2) If the enhanced taxiway centre line marking intersects another runway-holding position marking, ~~such as for a precision approach category II or III runway~~, that is located within 47m of the first runway-holding position marking, the enhanced taxiway centre line marking shall be interrupted 0.9m prior to and 0.9m after the intersected runway-holding position marking. The enhanced taxiway centre line marking shall continue beyond the intersected runway-holding position marking for at least 3 dashed line segments or, ~~if there are more than 3 dashed line segments, for a distance equal to the total length of this enhanced centre line marking, i.e. 47m $\pm$ 1m from start to finish, whichever is greater.~~ See Figure 5-7(b).
- The previous comment applies analogously to (3).
- According to paragraph (5) of 5.2.8.9, the legend in Figure 5-7(b) should read “(e) Between two opposing holding positions”.
-

The principle behind this specification appears to be that of improving the visibility of the runway centre line marking by tripling its thickness in order to warn the pilot that he is about to enter the runway and to denote the proximity of a runway-holding position marking (cf. 5.2.8.4). In fact, the aircraft must stop at different holding points, even if there are several for the intersection concerned. Thus it appears that the enhanced taxiway centre line marking must start at all of the activated holding points provided for the

corresponding runway/taxiway intersections. Additionally, the length of 47m $\pm$ 1m should apply starting from all of these holding points, not only starting from the one(s) that is/are closest to the runway. On the basis of this principle, standard 5.2.8.9 could easily be simplified.

Japan

With regard to 5.2.8.9 (4) the words of “inner dashes not less than 3m ” should be added to figure 5-7 (d) as well as in the working paper of the Aerodrome Panel, AP/2-WP/10.

Switzerland

(3) / Figure (c) The proposed interruption enhanced taxiway centre line marking prior and after an intersecting taxiway of just 1.5 m is not enough. The proposed design could be misinterpreted as a runway holding position.

(4) / Figure (d) Enhanced taxiway centre line markings should not be used on a portion of a taxiway which does not solely lead to a runway holding position. Otherwise the aspired increased awareness before a runway will be lost as a pilot will taxi along and above different enhanced taxiway centre line markings even without entering or crossing a runway.

SECRETARIAT’S COMMENTS

The comment from **Cyprus, Ireland and Italy** are noted. The Secretariat notes that there are no proposals for amending the State letter proposed amendments.

The comments from **France** are noted. The Secretariat does not consider that the term “provided” is used in an imprecise manner and notes that the term “where provided” is used otherwise in Annex 14. The Secretariat does not consider that the term “at” indicates the precise line where a taxiway terminates at the runway edge, but is used to indicate the general location of the taxiway/runway intersection. This can be seen in existing paragraph 3.1.2.2 where a runway-holding position is established “at” the intersection of a taxiway and a runway and “at” the intersection of a runway with another runway, but then the more precise location is provided in Table 3-2. The Secretariat supports the Translator’s note that reversing the French into English creates unnecessary redundancy. The Secretariat notes that Figure 5-7 of the English version of the State letter does not contain tolerances. The Secretariat does not support the proposal to change 5.2.8.9(2) or (3) as it does not provide any additional clarity and introduces a tolerance that does not otherwise exist except in the French version of Figure 5-7. The Secretariat further notes that the terminology “opposing” in 5.2.8.9(5) is used as a descriptive word, not as the title of a separate type of marking. As Figure 5-7(e) depicts two opposing runway holding positions the Secretariat considers that the information is appropriately provided as described in 5.2.8.9(5).

The comment from **Japan** is noted. The Secretariat notes that the proposed wording in the comment was originally present in Figure 5-7 and was removed (among other information) for clarification/simplification during the preliminary review. The Secretariat supports leaving Figure 5-7 in its current form.

The comments from **Switzerland** are noted but not supported. In regard to Figure 5-7(c) the Secretariat notes that the enhanced taxiway centre line does not look like either Pattern A or Pattern B runway-holding position markings. In regard to Figure 5-7(d) the Secretariat further notes that the presence of enhanced taxiway centre line markings on parallel taxiways at entrances other than those intended to be used by an air crew (e.g. – those which the air crew are simply taxiing over while they pass through to a

destination further down the parallel taxiway) still provide the crew with an increased awareness of their proximity to a runway.

ACTION PROPOSED

No change.

REFERENCE: Page A-17, paragraph 5.3.13.7

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The note in this specification implies that this type of system cannot be installed without the pilots that land there having specific knowledge thereof. Additionally, such a system cannot be installed at an international aerodrome open to the public, where it is impossible to know whether all of the pilots are well informed about the role attributed to these lights. Under these conditions, the simple touchdown zone lights should not be specified in Annex 14. Specifications 5.3.13.7 may, however, be included in the guidance after having been redrafted.

5.3.13.7 Simple Touchdown Zone Lights

Note.— The purpose of Simple Touchdown Zone Lights is to provide pilots with enhanced situational awareness in all visibility conditions and to help enable pilots to decide whether to commence a go around if the aircraft has not landed by a certain point on the runway. It is essential that pilots operating at aerodromes with Simple Touchdown Zone Lights be familiar with the purpose of these lights.

Application

5.3.13.7.1 Recommendation. *Except where TDZ lights are provided in accordance with paragraph 5.3.13, at an aerodrome where the approach angle is greater than 3.5 degrees and/or the Landing Distance Available combined with other factors increases the risk of an overrun, Simple Touchdown Zone Lights should be provided.*

Location

5.3.13.7.2 *Simple Touchdown Zone Lights shall be located both sides of the runway centreline at the upwind edge of the final Touchdown Zone marking. The lateral spacing between the pair shall be equal to the lateral spacing selected for the touchdown zone marking.*

5.3.13.7.3 Recommendation. *Where provided on a runway without TDZ markings, Simple Touchdown Zone lights should be installed in such a position that provides the equivalent TDZ information.*

Characteristics

5.3.13.7.4 *Simple Touchdown Zone Lights shall be fixed unidirectional lights showing variable white, aligned so as to be visible to the pilot of a landing aeroplane in the direction of approach to the runway.*

5.3.13.7.5 Simple Touchdown Zone Lights shall be in accordance with the specifications in Appendix 2, Figure A2-5.

~~Note. Simple Touchdown Zone Lights should be supplied with power on a separate independent switchable circuit to other runway lighting so that they may be used when other lighting is switched off.~~

Switzerland

The principle of these new lights is defensible. Mentioning that pilots should be "familiar with the purpose of these lights" is too vague. At least ICAO should add in a note the importance of aeronautical publications (charting) as well as the training factor, e.g. a qualification process which are common for non standard approaches to an airport. As an AAIB UK bulletin states about such light used in London City "the lights are visible during approach but they tend to disappear below the aircraft's nose in the landing flare. This can sometimes make it difficult for pilots to judge whether or not they will touch down before or after the lights.", ICAO should add a note on that aspect in this new chapter and/or consider specific requirements in the Appendix 2 "Aeronautical ground light characteristics".

An illustrating Figure would be helpful The Note under 5.3.13.7.5 contains a "should"; this word is generally not used in a Note.

SECRETARIAT'S COMMENTS

The comments from **France** are noted but not supported. The Secretariat notes that this system was brought forward by Member States with empirical data as to the effectiveness of this system in reducing runway excursions when used in the circumstances described in the Recommendation 5.3.13.7.1. The Secretariat further notes that flight crew awareness training on systems that may not be completely intuitive is not an unusual requirement in the aviation industry.

The comments from **Switzerland** are noted. The Secretariat notes that in DP No. 3 Related to AN-WP/8545 the WG/SRP of the ANC tasked the Operations Panel (OPSP), in collaboration with other relevant panels and study groups, to develop guidance material including associated procedures (such as reporting or publishing requirements) for several lighting systems including simple touchdown zone lights. The Secretariat considers that reporting, publishing and/or the establishment of training requirements should be done through this established channel rather than addressing these issues here for this system individually. The Secretariat supports the inclusion of a figure for increased clarity. The Secretariat also supports the removal of the word "should" from the Note as follows.

ACTION PROPOSED

Amend the Note to paragraph 5.3.13.7.5 to read as follows:

"Note.- As a good operating practice, simple touchdown zone lights are supplied with power on a separate circuit to other runway lighting so that they may be used when other lighting is switched off."

Add "Figure 5-24 Simple touchdown zone lights" (and re-number all subsequent Chapter 5 figures and text references to those figures) as follows:

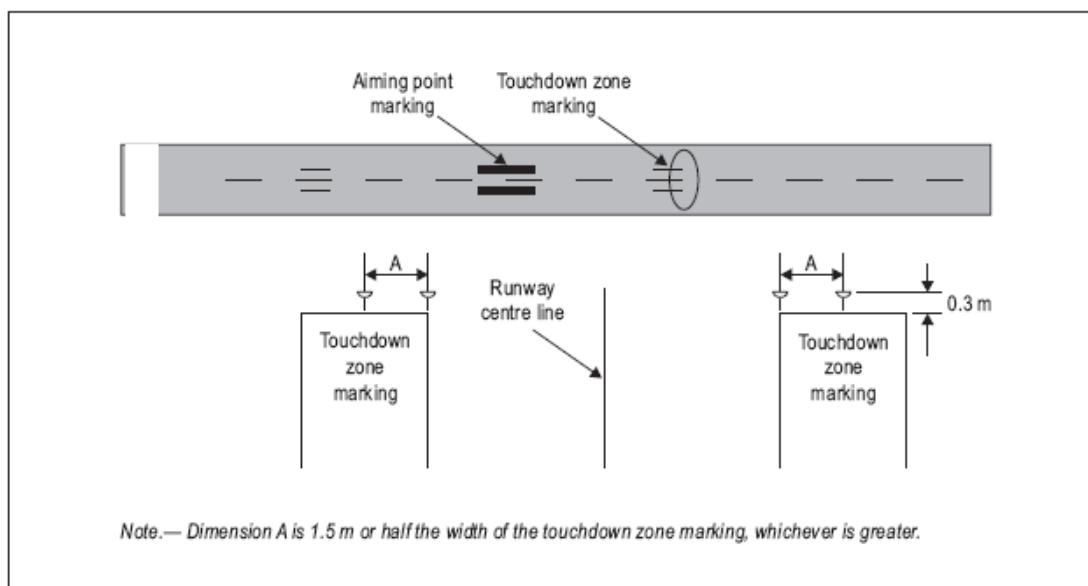


Figure 5-24. Simple touchdown zone lighting

REFERENCE: Page A-17, Note after heading 5.3.13.7

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Dominican Republic

(Note.— See appropriate partial language version of this AN-WP for original text.)

The meaning has not been correctly rendered in Spanish. The Spanish text need to be more consistent with the original.

SECRETARIAT'S COMMENTS

The comment from the **Dominican Republic** is noted.

ACTION PROPOSED

Refer to the Spanish Language Section. No change to the English text.

REFERENCE: Page A-17, paragraphs 5.3.13.7.1 and 5.3.13.7.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Dominican Republic

(Note.— See appropriate partial language version of this AN-WP for original text.)

For a more accurate translation of the original text, delete the word *and shown* in red (not visible on translator's copy and insert it before the phrase *which is part of* (also not seen on Translator's copy. (Translator's note: This comment is not clear in that it refers to words that do not appear in either the English or the Spanish Text. The apparent intent is to better align the Spanish text to the original.)

SECRETARIAT'S COMMENTS

The comment from the **Dominican Republic** is noted.

ACTION PROPOSED

Refer to the Spanish language section. No change to the English text.

REFERENCE: Page A-17, paragraph 5.3.13.7 Simple Touchdown Zone Lights

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium

More characteristics are missing like for example the number of lights, total length, distances between two light units.

5.3.13.7.4 Mentions "lights showing variable white". What is meant by variable white?

Cyprus

Ireland

Italy

Simple touchdown zone lights are currently in use at aerodromes where the approach angle is greater than 3 degrees and/or where the Landing Distance Available combined with other factors increases the risk of overrun. The use of these lights has greatly reduced the risk of overrun at aerodromes where such systems have been employed. The proposal is therefore considered to have a clear safety benefit.

Netherlands

Disagreement with: The introduction of paragraph 5.3.13.7 in Chapter 5 of Annex 14, Vol I.
Comment: The application of the system is so specific that a description in chapter 5 of the Annex 14, Vol I is not necessary. What's more the proposal is not complete since specific location, spacing and amount of fixtures is not included.

Proposal: Insert the description of the simple touchdown zone lights to Attachment A. Supplementary, the following note can be added to paragraph 5.3.13:

Note – Except where TDZ lights are provided in accordance with paragraph 5.3.13, at an aerodrome where the approach angle is greater than 3.5 degrees and/or the Landing Distance Available combined with other factors increases the risk of an overrun, simple TDZ Lights may be provided. Attachment A contains more guidance concerning the application of Simple TDZ Lights.

Singapore

On paragraph 5.3.13.7.2, in the interest of ensuring consistent implementation at aerodromes worldwide, Singapore would like to seek clarification on whether the Simple Touchdown Zone Lights would consist of a single pair of lights (i.e. one light on either side of the runway centerline), or multiple pairs of lights spaced laterally.

ACI

The term ‘upwind edge’ should be clarified by a diagram showing specific location, spacing and number of fixtures.

We suggest that ICAO delete the word “variable” from this paragraph.

5.3.13.7.4 “.....lights showing ~~variable~~ white.”

IFALPA

IFALPA believes the introduction of Simple Touchdown Zone Lights will contribute to the reduction of overruns and therefore requests 5.3.13.7.1 becomes a Standard.

SECRETARIAT’S COMMENTS

The comments from **Belgium** and **Singapore** are noted. The Secretariat notes that the intent of this system is for a pair of lights to be located on each side of the centre line. While this is alluded to in the second sentence of paragraph 5.3.13.7.2, the Secretariat agrees that this intent could be made more explicit. The Secretariat further notes that “variable white” is nomenclature commonly used in Annex 14, Volume I in regard to the colour of lights and is defined in Appendix 1 of Annex 14, Volume I.

The comments from **Cyprus**, **Ireland** and **Italy** are noted and supported.

The comments from the **Netherlands** are noted but not supported. The Secretariat notes that the effectiveness of this system in reducing runway excursions provides a sufficient safety case for the inclusion of this system in the design document of Annex 14 for the circumstances indicated. The Secretariat considers that the specific location and spacing was provided by reference to the touchdown zone marking, and that the number of fixtures is more specifically presented in the proposal below.

The comment from **ACI** is noted. The Secretariat considers that details of the specific location of the lights is provided, as referred, in the section on touchdown zone marking (paragraph 5.2.6), and that information on spacing and number of fixtures is addressed in the action proposed below. The Secretariat also notes again that “variable white” is nomenclature commonly used in Annex 14, Volume I in regard to the colour of lights and is defined in Appendix 1 of Annex 14, Volume I.

The comment from **IFALPA** is noted. The Secretariat supports referral of the study of the upgrading of 5.3.13.7.1 to a Standard to the AP.

The Secretariat further notes that the 1.5 m spacing between lights proposed below is consistent with the spacing provided for Touchdown zone lights in existing paragraph 5.3.13.3.

ACTION PROPOSED

Amend paragraph 5.3.13.7.2 to read as follows:

5.3.13.7.2 Simple touchdown zone lights shall be a pair of lights located on each side of the runway centre line 0.3 metres beyond the upwind edge of the final touchdown zone marking. The lateral spacing between the inner lights of the two pairs of lights shall be equal to the lateral spacing selected for the touchdown zone marking. The spacing between the lights of the same pair shall not be more than 1.5 m or half the width of the touchdown zone marking, whichever is greater. (see Figure 5-24)

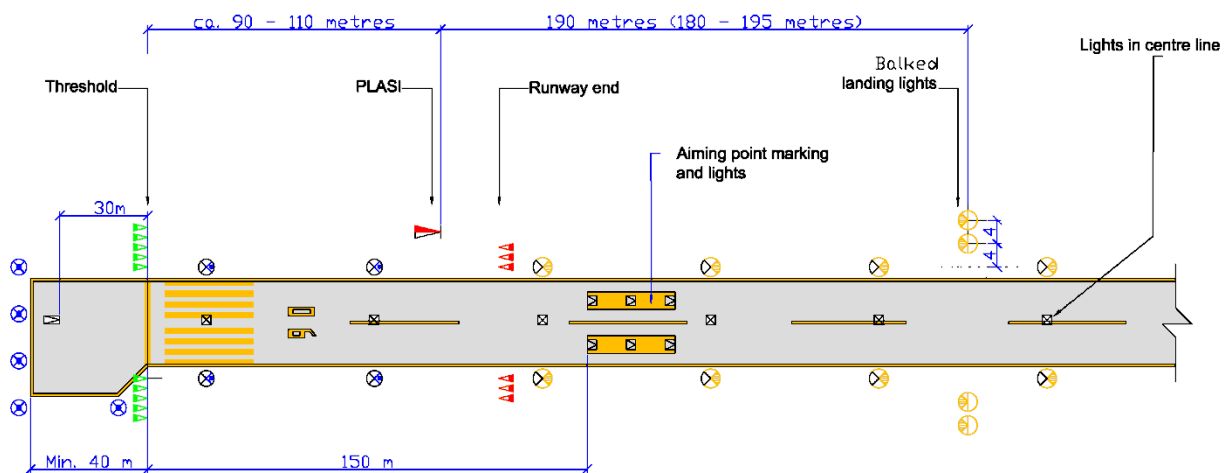
Refer the study of the upgrading of paragraph 5.3.13.7.1 to a Standard to the AP.

REFERENCE: Page A-17, Simple Touchdown Zone Lights, paragraph 5.3.13.7

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Norway

To facilitate precise landings on shorter non-precision runways (800-850m) Norway has developed a set of requirements with regard to lighting of the runway system. These requirements include Balked Landing Guidance Lights as well as Cat I Approach Lighting System (though shorter versions), lights on the centre line with a spacing equal to the runway edge lights, and three consecutive lights on each stripe of the aiming points, as shown on the illustration:



The Norwegian Balked Landing Lights have a similar purpose as the Simple Touchdown Zone Lights that are suggested in the new paragraph 5.3.13.7 of Annex 14. We therefore take the opportunity to explain

the lights in this paper, as a possible alternative for use on short runways with no touchdown zone markings.

Balked Landing Guidance Lights

Purpose:

The purpose of these lights is to give the pilot information about the aircraft position related to touch-down. If these lights are passed before actual touch-down, the pilot will commence a go around.

Location:

The two groups of lights shall be located on each side of the runway, outside the Runway Edge Lights, at a specified distance beyond the Runway Threshold, normally 270-300m. The exact distance shall be decided in close cooperation with the air operator, and will i.e depend on the location of the Visual Approach Slope Indicator (often steep approach).

The innermost light shall be located 4 m outside a line through the Runway Edge Lights. The distance between the two lights in the group shall be 4 m.

Characteristics:

Balked Landing Guidance Lights shall be in accordance with the specifications of yellow Runway Edge Lights for a precision runway in ICAO Annex 14, Volume I, showing yellow in the approach direction. The intensity should be adjusted together with the Runway Edge Lights.

SECRETARIAT'S COMMENTS

The comments from **Norway** are noted and appreciated. The Secretariat encourages **Norway** to provide a paper to the relevant working group (Visual Aids Working Group) of the AP for study and possible development.

ACTION PROPOSED

Refer the Norwegian Balked Landing Guidance Lights requirements to the AP for study pending submission of a working paper by Norway.

REFERENCE: Page A-18, paragraph 5.3.16.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Republic of Moldova

(Note.— See appropriate partial language version of this AN-WP for original text.)

On page A-18, the proposed amendment, para. 5.3.6.18 should read 5.3.16.8.

SECRETARIAT'S COMMENTS

The comment from the **Republic of Moldova** is noted and appreciated. The Secretariat considers that the comment must be in regard to a translated copy of the State letter as the English version correctly refers to paragraph 5.3.16.8.

ACTION PROPOSED

No change.

REFERENCE: Page A-18, paragraphs 5.3.16.6 to 5.3.16.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

More clarity is provided without having any impact, while paragraph 5.3.16.7 together with recommendation 5.3.16.8 provide information on taxiway centreline lights close to a runway and match the runway entrance taxiway lighting to the existing exit taxiway lighting. This change aims to improve runway safety by reducing runway incursions, and therefore the safety is enhanced.

SECRETARIAT'S COMMENTS

The comment from **Cyprus, Ireland** and **Italy** is noted and supported.

ACTION PROPOSED

No change.

REFERENCE: Page A-18, paragraph 5.3.16.6

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

5.3.16.6 is a standard. As written, the exception principle stipulated in 5.3.16.6 forms part of this standard. 5.3.16.8, which constitutes this exception principle, is, however, merely a recommendation. Thus there is a discrepancy in the regulations.

We propose the following language:

5.3.16.6 ~~Except as provided for~~ when the stipulations described in 5.3.16.8 are applied, Taxiway centre line lights on a taxiway other than an exit taxiway and on a runway forming part of a standard taxi-route shall be fixed lights showing green with beam dimensions such that the light is visible only from aeroplanes on or in the vicinity of the taxiway.

SECRETARIAT'S COMMENTS

The comment from **France** is noted but not supported. The Secretariat considers that the exception principle being a Recommendation is irrelevant, as it only matters to paragraph 5.3.16.6 whether or not the action of 5.3.16.8 was chosen to be followed or not. The Secretariat also notes that the proposed

change of wording does not address the stated concern, but treating it as a separate comment, the Secretariat does not support the wording change as it does not provide any increased clarity.

ACTION PROPOSED

No change.

REFERENCE: Page A-18, paragraph 5.3.16.7

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Netherlands

Disagreement with: 5.3.16.7 The addition of the phrase “The first light in the exit centre line shall always show green and”

Comment: The reason that the first light always has to show green is not clear. When it will not be possible to add an additional green light in existing situations, existing systems will have to be completely reinstalled without clear safety benefit.

Proposal: Delete the phrase “The first light in the exit centre line shall always show green and”

ACI

The reason for having the first light green (5.3.16.7) is not clear and if it will not be allowed to add in existing situations as correcting measure an additional green light, existing systems will have to be completely reinstalled without clear safety benefit.

SECRETARIAT'S COMMENTS

The comment from the **Netherlands** and **ACI** is noted but not supported. The Secretariat notes that the requirement for the first light to show green is not intended to affect existing infrastructure as it is only the lens of the light fixture that needs to be replaced to show green. The Secretariat considers that the first light showing green, as opposed to yellow, more readily provides the flight crew with the information that it is in fact an active taxiway.

ACTION PROPOSED

No change.

REFERENCE: Page A-18, paragraph 5.3.16.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

In order to avoid repetitions, we propose:

5.3.16.8 Recommendation.— *Where it is necessary to denote the proximity to a runway, taxiway centre line lights should be fixed lights showing alternating green and yellow from the perimeter of the ILS/MLS critical/sensitive area or the lower edge of the inner transitional surface, whichever is farthest from the runway, to the runway and continue alternating green and yellow until:*

a) their end point near the runway centre line; or

b) in the case of the taxiway centre line lights crossing the runway, to the opposite perimeter of the ILS/MLS critical/sensitive area or the lower edge of the inner transitional surface, whichever is farthest from the runway.

Note 1.— Care is necessary to limit the light distribution of green lights on or near a runway so as to avoid possible confusion with threshold lights.

Note 2.— The provisions of 5.3.16.8 can form part of effective runway incursion prevention measures.

Switzerland

We suggest to add to this paragraph, that where stop bars are provided alternating green and yellow taxiway centre line lights on entering taxiways are not necessary as they don't provide any advantage.

SECRETARIAT'S COMMENTS

The comment from **France** is noted but not supported as it does not provide increased clarity.

The comment from **Switzerland** is noted. The Secretariat supports the referral to the AP of the study of whether or not the alternating yellow and green taxiway centre line lights can be or should be exempted in the presence of stop bars.

ACTION PROPOSED

Refer the study to the AP of whether or not the alternating yellow and green taxiway centre line lights of paragraph 5.3.16.8 can be/should be exempted in the presence of stop bars.

REFERENCE: Page A-19, paragraphs 5.3.19.1 and 5.3.19.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

United States

Add: 5.3.19.1 "less than or equal to a value of 350 m"

The existing text does not address the use of Stop bars when the runway visual range conditions are exactly 350 m.

Paragraph 5.3.19.1 address use of Stop bars for conditions less than a value of 350 m with exceptions.

Paragraph 5.3.19.2 address use of Stop bars for conditions between 350 m and 550 m with exceptions.

SECRETARIAT'S COMMENTS

The comment from the **United States** is noted. The Secretariat notes that this comment is in regard to a subject not proposed for change in the State letter. Although the Secretariat agrees there is merit to the comment it is noted that the current work programme of the AP includes the study of Annex 14 to determine any potential consequences of the consequential change in definition of the transition between Cat II and Cat III from 350 m to 300 m. The Secretariat proposes that this proposed amendment be considered during this review.

ACTION PROPOSED

No change.

REFERENCE: Page A-19, Section 5.3.19 Stop Bars

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Australia

Section 5.3.19 Stop Bars - *Except for 5.3.19.9, Agreement with comment*

Comment:

While this section of Annex 14 is being amended, ICAO should take the opportunity of improving the clarity of this section, by combining the intent of 5.3.19.1 and 5.3.19.2 into a single standard. The applicability of "less than a value of 350 m" and also "values between 350 m and 550m", in fact means a single applicability of "*runway visual range conditions less than a value of 550 m*".

The present two- paragraph way of stating a single requirement is, we believe, a result of a previous change to 5.3.19.2 when it was upgraded from a recommendation to a standard, when 5.3.19.1 was already a standard.

SECRETARIAT'S COMMENTS

The comment from **Australia** is noted. The Secretariat notes that this subject was discussed within the relevant working group of the AP and, as the AP has not yet studied the potential consequences of the consequential change in definition of the transition between Cat II and Cat III from 350 m to 300 m, there

are Member States of the AP who have expressed a strong desire for paragraphs 5.3.19.1 and 5.3.19.2 to remain as they are until the larger impact on the change in definition can be studied. The Secretariat considers that there is no negative effect of leaving these two paragraphs separate.

ACTION PROPOSED

No change.

REFERENCE: Page A-20, paragraph 5.3.19.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium

The remark in the rationale is not clear: why will the existing 5.3.19.13 c be included in new 5.3.19.3? In fact, this seems not to be the case. 5.3.19.13 c is already included in the new 5.3.19.14.

SECRETARIAT'S COMMENTS

The comment from **Belgium** is noted. The Secretariat notes that the rationale does not indicate that existing 5.3.19.13 c will be included in new 5.3.19.3, but rather that existing 5.3.19.13 c, in combination with the new 5.3.19.3, suffices for the information provided in existing 5.3.19.9 which is therefore replaced (deleted as being redundant). The Secretariat notes that the information from existing paragraph 5.3.19.13 c is included in the new 5.3.19.14 c because new paragraph 5.3.19.14 is the existing 5.3.19.13 re-numbered.

ACTION PROPOSED

No change.

REFERENCE: Page A-20, paragraphs 5.3.19.3 and 5.3.19.6, page A-21 paragraph 5.3.19.8 and paragraph 5.3.19.9, page A-22 paragraph 5.3.19.14

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus Ireland Italy

Paragraph (5.3.19.3) aims at clarifying the use of multiple stop bars in order to avoid confusion to flight crews, which could lead to runway incursions. Moreover, the safety benefit of the proposed recommendation (5.3.19.6), in compacting runway incursions, is evident and important. The proposed change to paragraph 5.3.19.8 allows the installation of lights in a stop bar at uniform intervals of less than 3m, increase the conspicuity of the stop bar, while maintaining the consistency of the visual cue given to flight crews and vehicle operators, without having an impact on aerodromes, therefore increasing safety. The deletion of paragraph 5.3.19.9, is justified, as it is now covered under new paragraph 5.3.19.3 and existing 5.3.19.13 (c). Finally, Note 1 to existing paragraph 5.3.9.13 is proposed to be deleted from

ANNEX 14 because it addresses operational requirements. However, this factual information could be somehow provided in the relevant guidance material.

SECRETARIAT'S COMMENTS

The comments from **Cyprus, Ireland** and **Italy** are noted and supported.

ACTION PROPOSED

No change.

REFERENCE: Page A-20, paragraph 5.3.19.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

For greater precision, we propose:

5.3.19.3 Where there is more than one stop bar associated with a taxiway/runway intersection, only one shall be illuminated at any given moment.

Netherlands

Disagreement with: 5.3.19.3 Where there is more than one stop bar associated with a taxiway/runway intersection, only one shall be illuminated.

Comment: The word 'illuminated' is not making clear what is meant. The stop bar should be actually working so it should be active.

Proposal: Replace 'illuminated' by 'active'.
5.3.19.3 Where there is more than one stop bar associated with a taxiway/runway intersection, only one shall be **active**.

Switzerland

The second part of the sentence should read, "...only one shall be illuminated at any one time."

ACI

It might be clearer to make a change as follows:

5.3.19.3 Where there is more than one stop bar associated with a taxiway/runway intersection, only one shall be illuminated at any particular time.

SECRETARIAT'S COMMENTS

The comments from **France, Switzerland** and **ACI** are noted and supported as providing clarity.

The comment from the **Netherlands** is noted but not supported. The Secretariat notes that the terminology "active" is more appropriate to the operational status of the runway-holding position, whereas paragraph 5.3.19.3 is meant to address the technical status of the stop bar as being either "illuminated" or not (even though it is recognized that the "illuminated" stop bar is the stop bar at the "active" runway-holding position).

ACTION PROPOSED

Amend paragraph 5.3.19.3 to read as follows:

“5.3.19.3 Where there is more than one stop bar associated with a taxiway/runway intersection, only one shall be illuminated at any given time.”

REFERENCE: Page A-20, paragraph 5.3.19.6

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Brazil

The proposed No-Entry Bars (5.3.19.6) should be separated from the existing Stop Bars (5.3.19), as was suggested by the AP/2. The reasons are: No-Entry Bars should not always be associated with Runway Holding Positions. Installation parameters should be similar to Stop Bars characteristics; however, its application, location and control functions should be different. References to the No-Entry Bar and the Stop Bar in the same paragraph bring additional requirements such as Runway Holding Positions markings and signage, and may lead to confusion.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

[Translator's note: this comment corrects an error in the French text but does not affect the English version.]

Japan

Disagreement with comments

With regard to 5.3.19.6, a stop bar and a no-entry bar have different uses, therefore a no-entry bar should be identified in the Annex as a new aeronautical light.

Netherlands

Disagreement with: 5.3.19.6 Recommendation.- *A stop bar should be provided, where it is deemed necessary, as a no-entry bar across a taxiway which is intended to be used as an exit only taxiway to assist in preventing inadvertent access of vehicles or aircraft to that taxiway.*

Comment: The no-entry bar is introduced without any specific conditions of use (on/off). So the requirements for stop bars (5.3.19.1) are applicable. The no-entry bar will thus not be operational at all circumstances (good visibility) when the runway is operational.

The original proposal by the Aerodomes Panel was to introduce a no-entry bar besides the stop bar. It is unfortunate to see that the AP proposal is not included in the proposal for amendment AN 4/1.1.52-11/41.

The Netherlands agree with the response of the Visual Aids Working Group as stated below.

The proposed “no entry bar” is not a stop bar and may not necessarily be associated with a recognized holding position. Nor is its function to “hold”

aircraft for a short period of time. The characteristics of the installation are similar, however, the application, location and control functions of the installations are different. A no-entry bar may well be illuminated for an entire day or more, or could possibly be on for only a short time, depending on a number of factors such as aerodrome configuration, traffic flows etc. There is not a requirement to continuously switch it on and off. Linking the no-entry bar with the stop-bar paragraphs brings in additional requirements such as markings and signage, and may lead to further confusion. It should be noted that the Runway Incursion Sub-Group initially considered combining the no-entry bar language with the stop-bar specifications, however that link was rejected because of the reasons stated above.

Proposal: The Netherlands suggest to replace the proposed text by the originally proposed text for the no entry bar as follows:

5.3.29 No Entry Bar

Note 1.— The provision of a no entry bar requires its manual control by air traffic services.

Note 2.— Runway incursions may take place in all visibility or weather conditions. The provision of no entry bars at taxiway/runway intersections and their use at night and in all visibility conditions can form part of effective runway incursion prevention measures.

Application

5.3.29.1 Recommendation.—A no entry bar should be provided across a taxiway which is intended to be used as an exit only taxiway to assist in preventing inadvertent access of vehicles or aircraft to that taxiway.

Location

5.3.29.2 Recommendation.—A no entry bar should be located across the taxiway at the end of an exit only taxiway where it is desired to prevent traffic from entering the taxiway in the wrong direction.

Characteristics

5.3.29.3 Recommendation.— A no entry bar should consist of unidirectional lights spaced at intervals of 3 m across the taxiway, showing red in the intended direction(s) of approach to the runway.

5.3.29.4 Recommendation.— Where the normal no entry bar lights might be obscured (from a pilot's view), for example, by snow or rain, or where a pilot may be required to stop the aircraft in a position so close to the lights that they are blocked from view by the structure of the aircraft, a pair of elevated lights should be added to each end of the no entry bar.

5.3.29.5 The intensity in red light and beam spreads of no entry bar lights shall be in accordance with the specifications in Appendix 2, Figures A2-12 through A2-16, as appropriate.

5.3.29.6 Recommendation.— *Where no entry bars are provided and where, from an operational point of view, higher intensities are required to maintain light perception in very low visibilities or in bright daytime conditions, the intensity in red light and beam spreads of no entry bar lights should be in accordance with the specifications of Appendix 2, Figure A2-17, A2-18 or A2-19.*

Note.— *High-intensity no entry bars are typically only used in case of an absolute necessity and following a specific study.*

5.3.29.7 Recommendation.— *Where a wide beam fixture is required, the intensity in red light and beam spreads of no entry bar lights should be in accordance with the specifications of Appendix 2, Figure A2-17 or A2-19.*

5.3.29.8 The lighting circuit shall be designed so that:
a) no entry bars are switchable selectively or in groups;
b) when a no entry bar is illuminated, any taxiway centre line lights installed beyond the no entry bar, when viewed towards the runway, shall be extinguished for a distance of at least 90 m; and
c) when a no entry bar is illuminated, any stop bar installed between the no entry bar and the runway shall be extinguished

ACI

Request for clarification: The no-entry bar seems to be introduced without any specific conditions of use, so presumably the requirements for stop bars (5.3.19.1) are applicable. Would the no-entry bar thus not be operational under all circumstances when the runway is operational (e.g. during good visibility)?

SECRETARIAT'S COMMENTS

The comments from **Brazil, France, Japan, and The Netherlands** are noted and supported, with a slight variation on the proposal from The Netherlands.

The comment from **ACI** is noted and the Secretariat submits that the action proposed will address this comment.

The Secretariat further notes the change in numbering of 5.3.29 to 5.3.28, as a result of the removal of the runway status lights material that had previously been presented as 5.3.28.

ACTION PROPOSED

Delete proposed new paragraph 5.3.19.6 (page A-20 of the State letter).

Add new section for no-entry bars, as follows:

5.3.28 No-entry bar

Note 1.— *The provision of a no-entry bar requires its manual control by air traffic services.*

Note 2.— *Runway incursions may take place in all visibility or weather conditions. The provision of no-entry bars at taxiway/runway intersections and their use at night and in all visibility conditions can form part of effective runway incursion prevention measures.*

Application

5.3.28.1 **Recommendation.**—*A no-entry bar should be provided across a taxiway which is intended to be used as an exit only taxiway to assist in preventing inadvertent access of vehicles or aircraft to that taxiway.*

Location

5.3.28.2 **Recommendation.**—*A no-entry bar should be located across the taxiway at the end of an exit only taxiway where it is desired to prevent traffic from entering the taxiway in the wrong direction.*

Characteristics

5.3.28.3 **Recommendation.**—*A no-entry bar should consist of unidirectional lights spaced at uniform intervals of no more than 3 m showing red in the intended direction(s) of approach to the runway.*

Note.— *Where necessary to enhance conspicuity, extra lights are installed uniformly.*

5.3.28.4 **Recommendation.**— *Where the normal no entry bar lights might be obscured (from a pilot's view), for example, by snow or rain, or where a pilot may be required to stop the aircraft in a position so close to the lights that they are blocked from view by the structure of the aircraft, a pair of elevated lights should be added to each end of the no-entry bar.*

5.3.28.5 The intensity in red light and beam spreads of no-entry bar lights shall be in accordance with the specifications in Appendix 2, Figures A2-12 through A2-16, as appropriate.

5.3.28.6 **Recommendation.**— *Where no-entry bars are provided and where, from an operational point of view, higher intensities are required to maintain light perception in very low visibilities or in bright daytime conditions, the intensity in red light and beam spreads of no-entry bar lights should be in accordance with the specifications of Appendix 2, Figure A2-17, A2-18 or A2-19.*

Note.— *High-intensity no-entry bars are typically only used in case of an absolute necessity and following a specific study.*

5.3.28.7 **Recommendation.**— *Where a wide beam fixture is required, the intensity in red light and beam spreads of no-entry bar lights should be in accordance with the specifications of Appendix 2, Figure A2-17 or A2-19.*

5.3.28.8 The lighting circuit shall be designed so that:

- a) no-entry bars are switchable selectively or in groups;
 - b) when a no-entry bar is illuminated, any taxiway centre line lights installed beyond the no-entry bar, when viewed towards the runway, shall be extinguished for a distance of at least 90 m; and
 - c) when a no-entry bar is illuminated, any stop bar installed between the no-entry bar and the runway shall be extinguished.
-

REFERENCE: Page A-20, paragraph 5.3.19.6

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Russian Federation

(Note.— See appropriate partial language version of this AN-WP for original text.)

With regard to the new Recommendation for the provision of “stop bar lights” across taxiways which are intended to be used as exit only taxiways (to prevent inadvertent access) it is necessary to set a deadline for their implementation and specify the conditions for their installation (define “where it is deemed necessary”).

Amend Appendix 2 associated with the introduction of the concept of “stop bars in the use as a no-entry bar” since this concept is not used in paragraph 5.3.19.6 but rather the concept of “stop bar lights”.

SECRETARIAT'S COMMENTS

The comments from the **Russian Federation** are noted. The Secretariat considers that it is not necessary to establish a deadline for a Recommendation. The Secretariat does note that the wording “where it is deemed necessary” is vague and, should this paragraph remain in light of the immediately preceding comment, supports the deletion of these words. The Secretariat further notes that Appendix 2 has been proposed for update to accommodate no-entry bars, as reflected on pages A-72 and A-73 of the State letter.

ACTION PROPOSED

Amend paragraph 5.3.19.6 (should it remain in light of the immediately previous comment) to read as follows:

5.3.19.6 Recommendation.- *A stop bar should be provided as a no-entry bar across a taxiway which is intended to be used as an exit only taxiway to assist in preventing inadvertent access of vehicles or aircraft to that taxiway.*

REFERENCE: Page A-20, paragraph 5.3.19.7

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

IFALPA

IFALPA is aware of some airports where the stop bars have been located across the taxiway but not perpendicular to the taxiway centreline which has obscured them. IFALPA requests that 5.3.19.7 adds “Stop bars shall be located across the taxiway and perpendicular to the taxiway centreline.....”

SECRETARIAT'S COMMENTS

The comment from **IFALPA** is noted. The Secretariat notes that paragraph 5.3.19.7 is not proposed for an update in the State letter but supports the concept of the proposal as providing clarity to the intent that stop bars be installed perpendicular to the centre line of the taxiway on which they are installed. The

Secretariat considers that this amendment is better suited to be included in the proposed amendment to paragraph 5.3.19.8 under Characteristics, which is being proposed for amendment.

ACTION PROPOSED

Amend paragraph 5.3.19.8 to read as follows:

“5.3.19.68 Stop bars shall consist of lights spaced at uniform intervals of no more than 3 m across the taxiway, and perpendicular to the taxiway centre line, showing red in the intended direction(s) of approach to the intersection or runway-holding position.”

REFERENCE: Page A-21, paragraph 5.3.19.8 and Rationale Box

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium

Grammatical error in the rationale.

(In the French translation: ...augmenter le nombre total de feux de barre d'arrêt en réduisant...)

We don't see what additional information 5.3.19.9 gives more than 5.3.19.8.

SECRETARIAT'S COMMENTS

The comment from **Belgium** is noted but not supported. The Secretariat first notes that the comment is to a paragraph that has not been proposed for amendment in the State letter. Further, the Secretariat considers that paragraph 5.3.19.9 provides specific information for stop bars located at runway-holding positions that is not required of stop bars at intermediate holding positions.

ACTION PROPOSED

No change.

REFERENCE: Page A-21, Note after paragraph 5.3.19.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

[Translator's note: the first comment does not apply to the English text.]

Note - Where necessary to enhance conspicuity of an existing stop bar, extra lights are installed uniformly installed lights may be added.

[Translator's note: The translator recommends that the proposal be implemented in French, but not in English, though it would be possible in English. The French proposal improves the style of the French text, but the corresponding change in English decreases the concision of the English text. The original English text remains more concise than the English translation of this French proposal.]

Switzerland

The Note after paragraph 5.3.19.8 does not provide a clear message by using the present tense. We suggest to use "Where necessary to enhance conspicuity of an existing stop bar, extra lights may be installed uniformly." or to alter this Note into a Recommendation and use the following wording: "Where necessary to enhance conspicuity of an existing stop bar, extra lights should be installed uniformly."

ACI

The use of the present tense does not convey a clear meaning. We suggest:

Note - Where necessary to enhance conspicuity of an existing stop bar, extra lights ~~are~~ may be installed uniformly.

SECRETARIAT'S COMMENTS

The comments from **France, Switzerland** and **ACI** are noted but not supported. The Secretariat considers that the Note to 5.3.19.8 appropriately provides additional clarifying information in regard to the best operating practice of the subject matter of 5.3.19.8. The Secretariat notes that the wording "*may be installed uniformly*" could lead to confusion as to whether or not any extra lights actually need to be installed uniformly. The Secretariat considers that the wording "are installed uniformly" provides accurate and relevant information as to the best operating practice when installing extra lights. The Secretariat does support the referral of the study of the possible need to upgrade the Note to a Recommendation to the AP.

ACTION PROPOSED

Refer the study of the possible need to upgrade the Note to 5.3.19.8 to a Recommendation to the AP.

REFERENCE: Page A-21, paragraph 5.3.19.9 and 5.3.19.13

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Australia

Disagreement with comment

Comment:

Deleting this paragraph deletes the mandatory requirement for a minimum line of taxiway centre line lights to be always provided beyond the stop bar. Removing the requirement for these lights also removes the positive "go" signal provided by there always being green centre line lights to come on when the stop bar lights extinguish. Without the green lights beyond the stop bar, a failure of the stop bar would look like a "go" signal to the pilot.

Australia believes the new 5.3.19.3 is relevant to the requirement for "at least three taxiway centre line lights" beyond the stop bar, in the direction it is intended for the aircraft to proceed. Para 5.3.19.13c does not mandate these lights beyond the stop bar; it simply states if centre line lights are installed beyond the stop bar, they have to behave in the appropriate way.

Brazil

The existing Note 1 to 5.3.19.13 gives a valid explanation about Stop Bars functionality. In addition to that, all the mentioned paragraph (5.3.19.13 (a) to 5.3.19.13 (d)) already addresses operational requirements to Stop Bars, which are linked to Stop Bars functionality stated at Note 1.

SECRETARIAT'S COMMENTS

The comments from **Australia** and **Brazil** are noted. The Secretariat notes further that the Australian concern was originally addressed by an AP proposal to expand the existing Note 1 to 5.3.19.13¹⁴ which would have added the words "in conjunction with an ATC clearance" to the end of the existing Note. It was determined in discussion with the informal groups of the ANC (CT and PDP) that the concept of this requirement provided clear safety enhancement but that Annex 14 was not the appropriate place for this ATC operational requirement to be addressed, whereas (in regard to the Brazilian concern) existing 5.3.19.13 itself addresses the design of the lighting circuit to support the operational requirement. The issue was referred to the Secretariat's ATM Section for development into a provision for Annex 11, PANS-ATM, or other documentation determined to be appropriate. An operational requirement for a flight crew to have a positive clearance from ATC in conjunction with the extinguishing of the stop bar addresses the safety concern expressed with the deletion of existing paragraph 5.3.19.9, and helps reduce prescriptive infrastructure requirements.

ACTION PROPOSED

No change.

REFERENCE: Page A-22, paragraph 5.3.19.14

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium

5.3.19.14 The lighting circuit shall be designed so that: (French translation: ...de manière à ce que : - et supprimer les "que" au début de chaque alinéa)

- a) stop bars located across entrance taxiways are selectively Switchable;
- b) stop bars located across taxiways intended to be used only as exit taxiways (a no-entry bar see 5.3.19.6) are switchable selectively or in groups;
- c) when a stop bar is illuminated, any taxiway centre line lights installed beyond the stop bar shall be extinguished for a distance of at least 90 m; and
- d) stop bars shall be interlocked with the taxiway centre line lights so that when the centre line lights beyond the stop bar are illuminated the stop bar is extinguished and vice versa.

We propose to replace d) by:

- d) when the centre line lights beyond the stop bar are illuminated, the stop bar is extinguished and vice versa.

SECRETARIAT'S COMMENTS

The comment from **Belgium** is noted. The Secretariat first notes that the subject matter of 5.3.19.14 is not proposed for change in the State letter; however, it is recognized that this sub-paragraph could be editorially streamlined without changing the message. This action deletes a duplicative "shall be" and deletes "interlocked with the taxiway centre line lights" which is exactly the situation being described in sub-paragraphs c) and d) and so can be seen as superfluous to state in sub-paragraph d).

ACTION PROPOSED

Amend paragraph 5.3.19.14 d) to read as follows:

~~"d) stop bars shall be interlocked with the taxiway centre line lights so that~~ when the centre line lights beyond the stop bar are illuminated the stop bar is extinguished and vice versa.

REFERENCE: Page A-23, Figure 5-28

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Canada

The present Figure 5-28 has only 5 lights for Configuration B whilst the requirement in 5.3.22.17 is that adjacent lights shall be alternately illuminated. As such, there must always be an even number of lights regardless of the width of the taxiway.

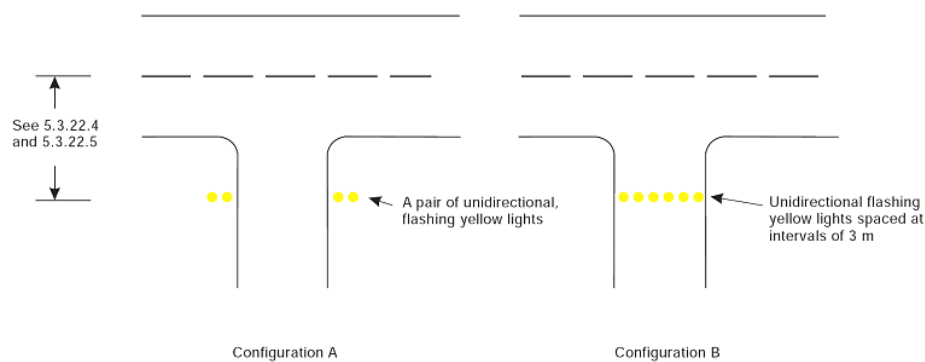


Figure 5-28 [modified]. Runway guard lights

SECRETARIAT'S COMMENTS

The comment from **Canada** is noted but not supported. The Secretariat considers that in the configuration of an odd number of lights (such as the five illustrated) the outer two lights and the middle light (which can be numbered 1, 3 and 5 for purposes of an example) alternate with the two remaining lights (which can be numbered 2 and 4 for purposes of an example). Lights 1, 3 and 5 can be illuminated in unison and can alternate with lights 2 and 4 which are illuminated in unison.

ACTION PROPOSED

No change.

REFERENCE: Page A-23 section 5.3.22, Page A-24 paragraphs 5.3.22.2 and 5.3.22.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

The word “active” in paragraph 5.3.22 is deleted in order to emphasize the fact that runway guard lights are intended to provide final warning to pilots and vehicle operators that are approaching a runway, irrespective of the runway status – active or not. Apart from the safety benefit, there is no impact on aerodromes. Moreover, the proposed changes to paragraph 5.3.22.2 refer to the operation of runway guard lights under all-weather operations, during day and night and do not make any reference to operating visibilities, since more often runway incursions occur in good visibility. The recommendation supports runway incursion prevention, while the deletion of paragraph 5.3.22.3 is self-evident.

SECRETARIAT'S COMMENTS

The comments from **Cyprus**, **Ireland** and **Italy** are noted and supported.

ACTION PROPOSED

No change.

REFERENCE: Page A-23, paragraphs 5.3.22.1 through 5.3.22.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium

5.3.22.1 Runway guard lights, Configuration A **or B**, shall be provided at each taxiway/runway intersection associated with a runway intended for use in:

- a) runway visual range conditions less than a value of 550 m where a stop bar is not installed; and
- b) runway visual range conditions of values between 550 m and 1 200 m where the traffic density is heavy.

5.3.22.3 Recommendation.- *As part of runway incursion prevention measures, Runway guard lights, Configuration A or B, should be provided at each taxiway/runway intersection and used under all weather conditions during day and night. associated with a runway intended for use in:*

- a) runway visual range conditions of values less than a value of 550 m where a stop bar is installed; and*
- b) runway visual range conditions of values between 550 m and 1200m where the traffic density is medium or light.*

For runway guard lights, Configuration B should not be collocated with a stop bar. Therefore for us this recommendation should remain.

5.3.22.3 Recommendation.- *Runway guard lights, Configuration A or Configuration B or both, should be provided at each taxiway/runway intersection where enhanced conspicuity of the taxiway/runway intersection is needed, such as on a wide-throat taxiway, except that Configuration B should not be collocated with a stop bar.*

Netherlands

Disagreement with: 5.3.22.2 Recommendation.- *As part of runway incursion measures, runway guard lights, Configuration A or B should be provided at each taxiway/runway intersection and used under all weather conditions during day and night.*

Comment: The application of runway guard lights should be limited to locations where an increased probability for runway incursions can be expected. This was intended and proposed by the Aerodromes Panel.

Proposal: 5.3.22.2 Recommendation.- *As part of runway incursion measures, runway guard lights, Configuration A or B should be provided at each taxiway/runway intersection and used under all weather conditions during day and night where an increased probability for runway incursions can be expected.*

Switzerland

As this paragraph is suggested to be deleted, there is no paragraph indicating that Configuration B should not be collocated with a stop bar. We suggest to add a Recommendation with the following wording: "Configuration B should not be collocated with a stop bar."

ACI

Add new clarification as follows:

5.3.22.2 **Recommendation.-** *As part of runway incursion prevention measures, runway guard lights, Configuration A or B, should be provided at each taxiway/runway intersection where an increased probability for runway incursions can be expected and used under all weather conditions during day and night, associated with a runway intended for use in:*

Further ACI comment:

We are in full support of the clarification in respect of the operation of runway guard lights under all visibility conditions day and night, which is considered to be a major improvement over the existing provisions.

IFALPA

IFALPA believes that when the two current paragraphs (5.3.22.2 and 5.3.22.3) were consolidated in the proposed 5.3.22.2, some text was unintentionally deleted and proposes that "except that Configuration B should not be collocated with a stop bar." is reinserted at the end of the sentence.

SECRETARIAT'S COMMENTS

The comments from **Belgium** are noted. The Secretariat notes that the proposal of the AP is to require Configuration A under the visual conditions described in paragraph 5.3.22.1 and the Secretariat does not support the expansion to include Configuration B.

In regard to the second comment from **Belgium** and the comments from **Switzerland** and **IFALPA**, the Secretariat notes that stop bars are only required by paragraph 5.3.19 s when it is intended that the runway will be used in RVR conditions less than 550 m. The Secretariat further notes that existing paragraph 5.3.22.5 requires that RGLs Configuration B be located at a distance from the runway specified for a take-off runway in Table 3-2. Table 3-2 provides different distances from the runway for a take-off runway (minimum RGL distance) and a precision approach Category I runway (minimum stop bar distance). The Secretariat does recognize that in actual practice an RGL minimum distance from the runway might need to be increased by local runway/taxiway configurations to the point where it might coincide with a precision approach runway-holding position (stop bar); however, this is an issue of best operating practice in the operational environment, whereas there is no conflict or ambiguity currently proposed in the provisions of the design document. The Secretariat notes, however, that there is no intention to now collocate Configuration B RGLs with stop bars and it would be a simple matter to retain information from a Recommendation within the new Recommendation.

The comments from **Netherlands** and **ACI** are noted and supported. The Secretariat notes that as a Recommendation the inclusion of the words "where an increased probability for runway incursions can be expected" can be seen as promoting the use of RGLs in "hot spots" where an aerodrome operator might choose not to use RGLs at all if the only option is to put them everywhere. The Secretariat notes that this

proposed change reflects the amendment proposal as originally put forward by the AP which was subsequently modified during the ANC preliminary review.

ACTION PROPOSED

Amend paragraph 5.3.22.2 to read as follows:

“5.3.22.2 **Recommendation.**- As part of runway incursion measures, ~~R—~~runway guard lights, Configuration A or B, should be provided at each taxiway/runway intersection where an increased probability for runway incursions can be expected, and used under all weather conditions during day and night, except that Configuration B should not be collocated with a stop bar. ~~associated with a runway intended for use in:~~”

REFERENCE: Page A-24, paragraph 5.3.22.3

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Republic of Moldova

(Note.— See appropriate partial language version of this AN-WP for original text.)

On page A-24, the number of para. 5.3.22.3 and its text have been deleted in their entirety, but the text there below has retained its numbering. We propose to amend the numbering of the paragraphs.

SECRETARIAT’S COMMENTS

The comment from the **Republic of Moldova** is noted. The Secretariat recognizes that the paragraphs following 5.3.22.3 were not repeated just to show the numbering changes, but agrees that the numbering changes are to be cascaded down through the remaining paragraphs.

ACTION PROPOSED

No change.

REFERENCE: No State letter Page number provided with comment, Chapter 5 and Chapter 7

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Uruguay

(Note.— See appropriate partial language version of this AN-WP for original text.)

CHAPTER 5. VISUAL AIDS FOR NAVIGATION

- (i) The purpose of this amendment presented in the working paper from the Eighth Meeting of the GREPECAS Sub-group on Aerodromes and Ground Support/Operational Planning of Aerodromes AGA/AOP/SG/8 — NE/17 is to enhance

Operational Safety, raise awareness of situations and thus aircraft surface safety on the aerodrome runways.

- (ii) The inclusion of a SARP taxiway side strip marker is recommended

The taxiway side strip marker is outlined in 7.2 Non-resistant surfaces

Application

7.2.1 When the edges of the taxiways, the taxiway turning platforms, the holding areas, the platforms, and other non-resistant surfaces cannot easily be distinguished from the surfaces suitable for supporting loads, the use of which could damage the aircraft, the limit between the surface and the surfaces suitable for supporting loads will be indicated by a taxiway side strip marker.

The specifications for the taxiway side strip markers are outlined in 5.2.7.

Location

7.2.2 Recommendation.— A taxiway side strip marker should be positioned along the edge of the pavement suitable for supporting loads so that the outside edge of the marker coincides approximately with the edge of the pavement suitable for supporting loads.

Rationale: The proposal is to remove 7.2.1 and 7.2.2 and replace them with a combination of paragraphs 5.2.9.1 to 5.2.9.5 plus figures. Text and figures recommended for **5.2.9 Taxiway side strip markers**

Application

5.2.9.1 Recommendation. Taxiway side strip markers shall be positioned to mark out the border between the edge of the usable taxiway and the edge of the pavement, with the outer edge of the marker strip being the usable edge of the pavement, See figure 5.5.

Location and characteristics

5.2.9.2 The taxiway side strip marking will consist of double continuous lines, 15 cm in width, with a 15 cm separation between them and in the same color as the taxiway centre line marking.

5.2.9.3 When there is an operational need to define the edge of a taxiway or parking station on a paved surface adjoining the edge of the taxiway and the pavement is designed to be used by the aircraft, for example a platform, or when the taxiway adjoins the platform, the markers will correspond to those established in 5.2.9.4 and they must be painted at a distance equal to half the width of the taxiway from the taxiway central marker.

5.2.9.4 The markers on the edge of the taxiway in accordance with 5.2.9.3 will consist of a double continuous line, 15 cm wide, with a 15 cm separation, in the same color as the taxiway central markers, and the lines must be 4.5 m long with a 7.5 m separation. These markers must not be used to outline islands with the exception of some very special conditions, See figure 5.8.

5.2.9.5 Where the edges of the taxiways, the runway turning platforms, the holding areas, the platforms, and other non-resistant surfaces cannot easily be distinguished from the surfaces suitable for supporting loads, the use of which could damage the aircraft, the limit between the surface and the surfaces suitable for supporting loads should be indicated by a taxiway side strip marker with the provision of additional side strips in accordance with 5.2.9.8. The characteristics of the taxiway side strip markers will comply with Fig. 5.6 and 5.7

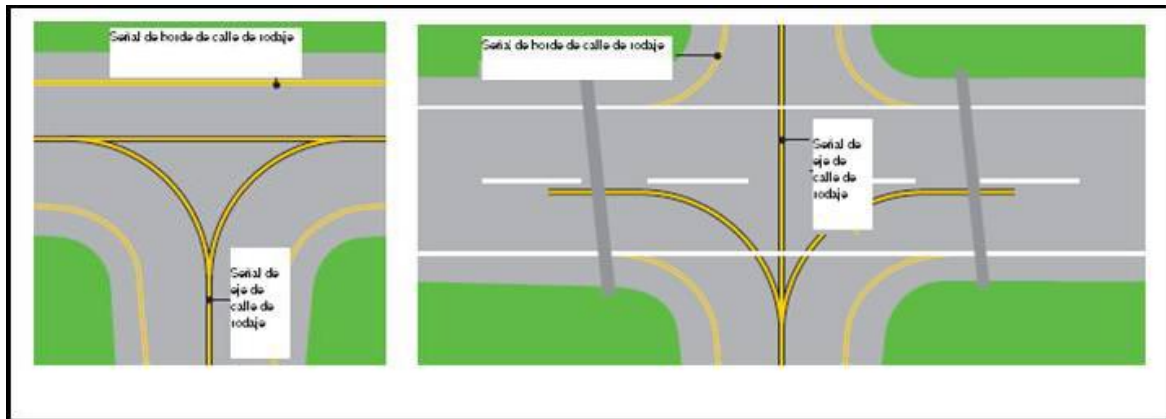


Fig. 5.5 Taxiway side strip markers

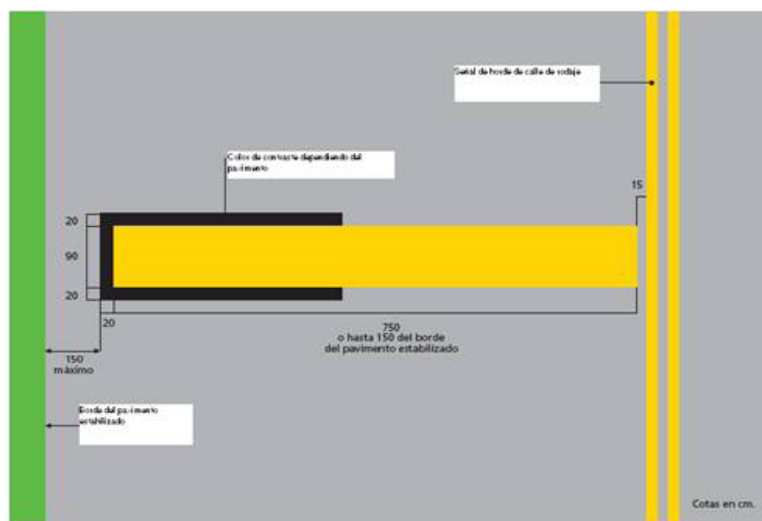


Fig. 5-6 Transversal strip marker

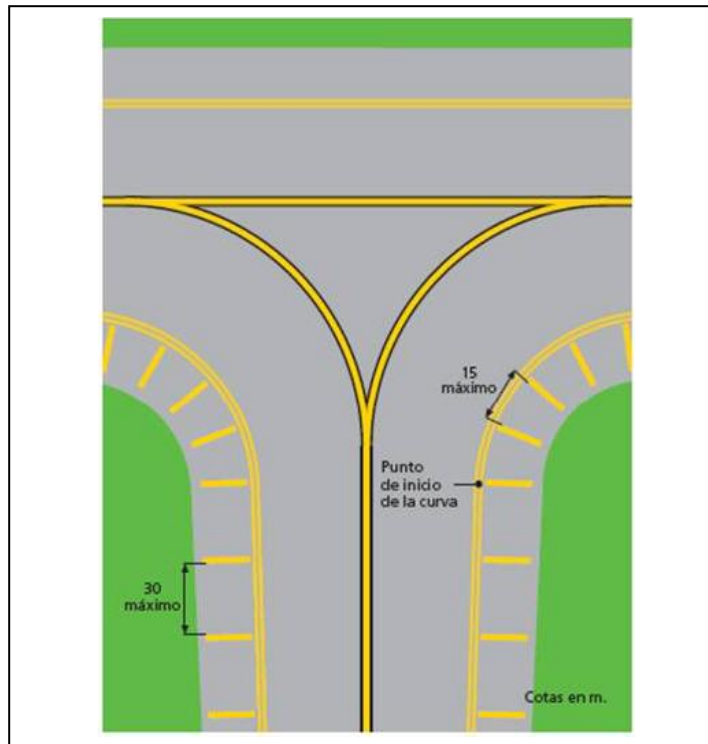


Fig. 5.7 Taxiway side strip markers with transversal strips

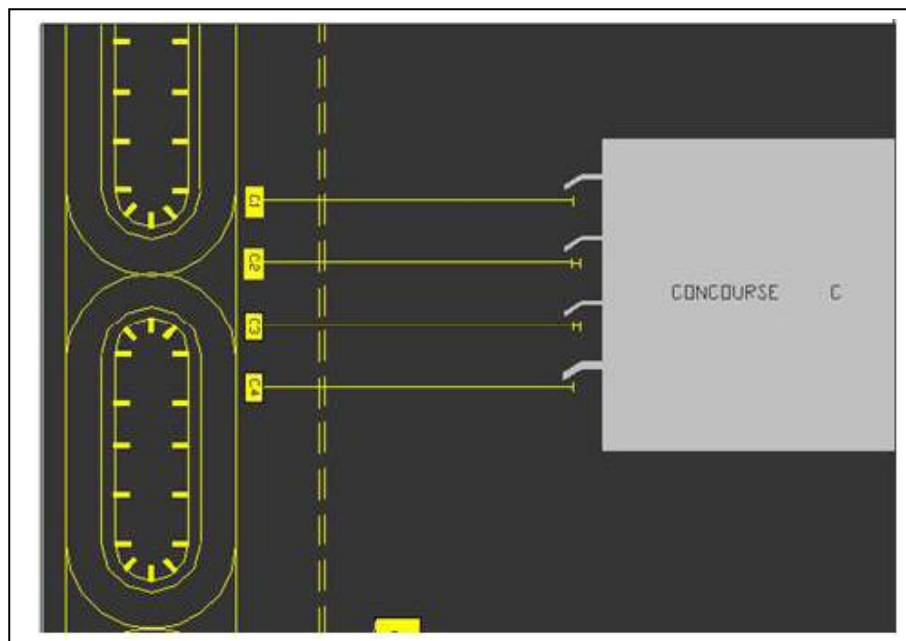


Fig. 5.8 Non-continuous taxiway side strip markers

SECRETARIAT'S COMMENTS

The comments from **Uruguay** are noted and appreciated. The Secretariat notes, however, that this comment is in regard to paragraphs not proposed for change in the State letter. The Secretariat considers that the amendment proposed should be subject to the review and development processes of the AP and its relevant working groups prior to consideration by the ANC as a proposed amendment.

ACTION PROPOSED

No change.

REFERENCE: Page A-25, Chapter 6

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

[Translator's note: the proposed change in the French heading does not affect the English text.]

In general, Chapter 6.1, as drafted, causes confusion. Sometimes the term “object” is used, sometimes the term “obstacle”, and the usage appears to be more or less arbitrary. The headings are not consistent with each other, since Chapter 6 discusses only aids for denoting the obstacles, not the other objects. Furthermore, the fact that the word “object” is used in certain specifications would lead the reader to suppose that they are not obstacles, whereas a reading of the corresponding specifications reveals that they are, in fact, obstacles in light of the definition in Chapter 1 of Annex 14. The other comments concerning this chapter, which are included below, are more precise.

It definitely seems that Chapter 6.1 could be streamlined. In fact, either we have objects which are considered obstacles because they are considered to be dangerous, and which must be marked and/or lighted (except for specific cases), or we have objects which are not obstacles, because they are not considered to be dangerous, and they must not be marked or lighted. More precise information is given in Chapter 4 of Annex 14 with respect to determining what type of object is considered an obstacle. There are, by the way, places where Chapter 4 and Chapter 6.1 overlap.

Furthermore, certain specifications contain indications about the nature of the lighting. These indications should appear in Chapter “6.2 Marking and/or lighting of objects” (a heading which should be changed to “6.2 Marking and/or lighting of **objects obstacles**”). This is the case for 6.1.1.1 and 6.1.1.2, *inter alia*.

A complete review of this Chapter 6.1 of Annex 14 is necessary, including a change in the heading to read: 6.1 **Objects obstacles** to be marked and/or lighted.

SECRETARIAT'S COMMENTS

The comments from **France** are noted. The Secretariat first notes that the AP has been tasked with dual objectives in regard to Chapter 6. The objective represented by the current amendment proposal is the re-structuring of Chapter 6 into a format more user friendly for the intended audience of the obstacle owner. The next objective in regard to Chapter 6 is to address the actual content, for example, reducing obstacle marking and lighting requirements when an object is shielded. The editorial note at the beginning of Chapter 6 (“Please note renumbering of Chapter 6”) and the rationale box at the end of Chapter 6 (“Restructure of Chapter 6 to improve readability for end user (e.g.: obstacle owners)”) provides this intent. Ideally, this would have all been accomplished at the same time but limited resources of the relevant working group and sub-group members doing the work only allowed for the re-structuring during this amendment cycle. The Secretariat supports the AP decision to go forward with restructuring while content changes are addressed during the current work cycle.

The Secretariat further notes that the observations by France reflect the work that the relevant working group of the AP will be doing over the next cycle and contribution of manpower and resources during this work is greatly appreciated, as always. To address the specific comments made, the Secretariat notes that the distinction between “objects” and “obstacles” is specific and that they must both be addressed and therefore both words must be used appropriately. The Secretariat does not support the proposed change of titles as increasing accuracy or clarity as, for example, paragraph 6.1.1.5 addresses “*A fixed object, other than an obstacle*”. As the term “object” is the broader category between “objects” and “obstacles” (i.e. – all obstacles are objects but not all objects are obstacles) then the title should remain as “objects” unless the entire section strictly addresses “obstacles” only.

ACTION PROPOSED

No change.

REFERENCE: Page A-25, paragraph 6.1.1

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The heading does not appear suitable because the first specifications relate to objects that are on the movement area and not necessarily within obstacle limitation surfaces (implied that they penetrate these surfaces). Are they perhaps objects located between the transition surfaces?

It would be useful to have two chapters as follows: a Chapter 6.1.1 that relates to objects on the movement area and takes into consideration 6.1.1.1 to 6.1.1.3, and a Chapter 6.1.2 that relates to objects penetrating the OLS and is underpinned by 6.1.1.4 to 6.1.1.10.

6.1.1 Objects Obstacles within obstacle limitation surfaces (within the lateral boundaries of the OLS) on the movement area

6.1.1.1 to 6.1.1.3

6.1.2 Obstacles penetrating the OLS

6.1.1.4 to 6.1.1.10

SECRETARIAT’S COMMENTS

The comment from **France** is noted. The Secretariat agrees that the titles of both paragraphs 6.1.1 and 6.1.2 can be simplified while retaining the intended message. The Secretariat does not support changing “Objects” to “Obstacles” as both 6.1.1 and 6.1.2 address objects that are not otherwise defined as obstacles.

ACTION PROPOSED

Amend the heading of 6.1.1 to read as follows:

“6.1.1 Objects within the lateral boundaries of the obstacle limitation surfaces”

Amend the heading of 6.1.2 to read as follows:

“6.1.2 Objects outside the lateral boundaries of the obstacle limitation surfaces”

REFERENCE: Page A-25, paragraph 6.1.1.1

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The first part of this specification stems from Chapter 4 of Annex 14.

For greater clarity, we propose:

6.1.6 6.1.1.1 ~~Vehicles and other Mobile objects~~ **obstacles, excluding aircraft,** on the movement area of an aerodrome ~~are obstacles and shall be marked and also lighted if the vehicles, mobile obstacles and~~ aerodrome are used at night or in conditions of low visibility, ~~lighted,~~ except that aircraft servicing equipment and vehicles used only on aprons may be exempt.

[Translator’s note: the other changes proposed in the French version do not affect the English text.]

We also propose to add the following to Chapter 4 of Annex 14:

“4.4.3 Vehicles and other mobile objects, excluding aircraft, on the movement area of an aerodrome are obstacles.”

SECRETARIAT’S COMMENTS

The comments from **France** are noted. While the Secretariat greatly appreciates the observations and comments it is noted that the State letter did not address substantial changes to content but primarily the re-structuring of Chapter 6 as the new framework for substantial content changes to be developed in the current work programme of the AP.

ACTION PROPOSED

No change.

REFERENCE: Page A-25 paragraph 6.1.3, page A-26 paragraphs 6.1.1.7 and 6.1.1.9 , page A-27 paragraph 6.1.1.10

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

The change in the wording of paragraphs 6.1.3 and 6.1.1.7 does not seem to have an impact as the meaning of the original text is maintained, while the introduction of the paragraph 6.1.1.9 is considered to contribute to the enhancement of safety. In addition, the amendment of paragraph 6.1.1.10 similarly enhances safety, by including the case of waterways where an obstacle should be denoted.

SECRETARIAT'S COMMENTS

The comments from **Cyprus, Ireland** and **Italy** are noted and supported.

ACTION PROPOSED

No change.

REFERENCE: Page A-26, paragraph 6.1.1.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The low visibility conditions should also be integrated into this specification, and the expression “extends” should be replaced by “penetrates” (see the following comment).

~~6.1.5~~ **6.1.1.8** A fixed object that ~~extends above~~ **penetrates** an obstacle protection surface shall be marked and, if the runway is used at night **or in conditions of low visibility**, lighted.

Note – See 5.3.5 for information on the obstacle protection surface.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat notes that the terminology “extends above” is currently used in several SARPs in Chapter 6 and so the use of this existing terminology provides consistency within existing text. The Secretariat further notes that the content of existing paragraph 6.1.5 has not been proposed for change but only its location within the re-structured Chapter 6 and considers that content changes should be vetted by the AP. The Secretariat notes that the study of amendments to the content of Chapter 6 is a work programme item of the current work programme of the AP.

ACTION PROPOSED

No change.

REFERENCE: Page A-26, paragraph 6.1.1.9

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The language in 6.1.1.9 is imprecise and the reference to the note in 4.4.2 accentuates this lack of precision.

An object is situated within an obstacle limitation surface if it penetrates that surface. Indeed, according to the definition of obstacles in Annex 14, a fixed (whether temporary or permanent) or mobile object or part thereof that extends above a defined surface intended to protect aircraft in flight is considered to be an obstacle. This implies that specification 6.1.1.9 would apply only in very specific and theoretical cases in which the object penetrates the obstacle limitation surface without extending above it. In fact, if the object extends above it, it is considered to be an obstacle and must meet the requirements for obstacles.

In fact, the definition of an obstacle in Chapter 1 of Annex 14 does not include the very specific case mentioned here. Nevertheless, the c) in this definition, “c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation” is in the same spirit as 6.1.1.9.

We also propose deleting 6.1.1.9, which causes confusion in relation to the definition of obstacle, and slightly changing this definition so as to take into account the case in 6.1.1.9.

~~6.1.1.9 **Recommendation**— Other objects inside the obstacle limitation surfaces should be marked and/or lighted if an aeronautical study indicates that the object could constitute a hazard to aircraft (this includes objects adjacent to visual routes e.g. waterway or highway).~~

~~Note. See note below 4.4.2.~~

“Obstacle. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

- a) are located on an area intended for the surface movement of aircraft; or
- b) ~~extend above~~ penetrate a defined surface intended to protect aircraft in flight; or
- c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

With this in mind, it would be useful to change the expression “extend above an OLS” by the expression “penetrate an OLS” in the specifications in Annex 14 that use this expression, such as 4.4.2.

SECRETARIAT'S COMMENTS

The comments from **France** are noted. The Secretariat notes that the proposed paragraph 6.1.1.9 is not duplicative of the definition of an Obstacle subpart c) as subpart c) states that it is defining an obstacle as those objects, or parts thereof, that *stand outside* surfaces while 6.1.1.9 addresses other objects *inside* the obstacle limitation surfaces, but which do not extend above the surfaces (which are addressed by the immediately preceding paragraph 6.1.1.8). The Secretariat also notes that the terminology “extends

above” is consistent with several SARPs in Chapter 6. The Secretariat considers that the change of the existing terminology of “extends above” to “penetrates” should be studied by the AP for unintended consequences prior to any change. The Secretariat notes that the study of amendments to content of Chapter 6 is an item in the current work programme of the AP.

ACTION PROPOSED

No change.

REFERENCE: Page A-27, paragraph 6.1.1.10

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

In light of the numbering, specification 6.1.1.10 comes under the category of objects within the OLS. According to the definition, these objects are obstacles which must meet the requirements of obstacles and shall thus be marked or lighted. As a result, this recommendation is confusing and it would be useful to delete it.

~~6.1.10 6.1.1.10 Recommendation Overhead wires, cables, etc., crossing a river, waterway, valley or highway should be marked and their supporting towers marked and lighted if an aeronautical study indicated that the wires or cables could constitute a hazard to aircraft~~

United Arab Emirates

The proposed Annex 14 changes text did not include the wording "...except that the marking of the supporting towers may be omitted when they are lighted by High-intensity Obstacle Lights by day." Was this deleted or accidentally omitted?

SECRETARIAT’S COMMENTS

The comment from **France** is noted but not supported. The Secretariat notes that the definition of “obstacle” does not include all “objects” within the OLS, but only those within the OLS that extend above the surface. As paragraph 6.1.1.10 does not make this distinction it is addressing those objects enumerated even if they do not extend above the OLS. Such objects that are within the OLS but do not extend above the OLS are not “obstacles” by definition, but 6.1.1.10 recommends that they be marked and lighted anyway if an aeronautical study indicates that they constitute a hazard to aircraft.

The comment from the **United Arab Emirates** is noted. The Secretariat notes that the rationale provided for proposed amendments to Chapter 6 (page A-41 of the State letter) shows in detail how the existing paragraphs were re-structured. In the case of existing paragraph 6.1.10, one can track where the second part of the Recommendation was moved to new paragraph 6.2.5.2 to better reflect the new structure.

ACTION PROPOSED

No change.

REFERENCE: Page A-27, Section 6.1.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The term in parentheses is confusing, because it is not clear precisely to what this term refers. It would be preferable to delete it.

6.1.2 Objects-Obstacles outside obstacle limitation surfaces (~~outside the lateral boundaries of the OLS~~).

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat agrees that the titles of both paragraphs 6.1.1 and 6.1.2 can be simplified while retaining the intended message. The Secretariat does not support changing “Objects” to “Obstacles” as 6.1.2 addresses objects that are not otherwise defined as obstacles.

ACTION PROPOSED

Amend the heading of 6.1.1 to read as follows:

“6.1.1 Objects within the lateral boundaries of the obstacle limitation surfaces”

Amend the heading of 6.1.2 to read as follows:

“6.1.2 Objects outside the lateral boundaries of the obstacle limitation surfaces”

REFERENCE: Page A-27, paragraphs 6.1.2.2 and 6.1.2.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

Both amendments are considered to enhance safety, because they address: a) the need to mark and/or light object(s) outside the OLS of an aerodrome, if an aeronautical study indicates that it/they could be a hazard to aircraft, and b) the additional case of waterways for denoting an obstacle situated outside the OLS.

SECRETARIAT'S COMMENTS

The comments from **Cyprus**, **Ireland** and **Italy** are noted and supported.

ACTION PROPOSED

No change.

REFERENCE: Page A-27, paragraph 6.1.2.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**France**

(Note.— See appropriate partial language version of this AN-WP for original text.)

According to the definition of obstacle in Annex 14, objects of this type are considered obstacles, and thus a specification of this nature is not useful. To the contrary, it causes confusion because it gives the impression that they are not obstacles.

~~6.1.2.2 Recommendation— Other objects outside the obstacle limitation surfaces should be marked and/or lighted if an aeronautical study indicates that the object could constitute a hazard to aircraft (this includes objects adjacent to visual routes e.g. waterway, highway).~~

SECRETARIAT'S COMMENTS

The comment from **France** is noted but not supported. The Secretariat notes that the immediately preceding paragraph 6.1.2.1 establishes the provision for the marking and lighting of obstacles in accordance with paragraph 4.3.2 which recommends that objects which extend to a height of 150 m or more above ground elevation be regarded as obstacles. The immediately following paragraph 6.1.2.2 then proceeds to address all other objects outside the OLS. The Secretariat therefore considers that the deletion of proposed paragraph 6.1.2.2 would result in some objects not being covered that that should be.

ACTION PROPOSED

No change.

REFERENCE: Page A-27, paragraph 6.1.2.2 and Page A-30, paragraph 6.2.3.13 a)

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Germany****Disagreement with comments**

Germany cannot agree with the intention of the proposed regulations as far as the area outside the obstacle limitation surface is concerned.

The term “outside” is not specific enough. This would mean that every object outside the obstacle limitation surface should be assessed by a study. Furthermore, every object within an unlimited distance to the obstacle limitation surface would have to be assessed for marking and lighting, which is neither practicable nor feasible.

In paragraph 4.3, ICAO has laid down adequate requirements regarding objects outside the obstacle limitation surfaces.

Germany proposes to delete the recommendation in 6.1.2.2 and standard 6.2.3.13 a).

If the recommendation is retained, the lighting requirements stated in section 6.2 have to address the special characteristics of obstacles outside the limitation surface. The application of the same requirements as for objects within the limitation surface would have considerable implications for the authorities and citizens and is clearly rejected for reasons of financial, environmental and legal concerns.

SECRETARIAT’S COMMENTS

The comments from **Germany** are noted. The Secretariat first notes that the conclusion that every object outside an OLS would need to have an aeronautical study is not indicated by the words of paragraphs 6.1.2.2 or 6.2.3.13a). To the contrary, the Secretariat considers that the implications for the authorities and citizens is that an object outside the OLS that extends to a height of *less than* 150 m but seems to constitute a hazard to aircraft can be made the subject of an aeronautical study. Such a study may (or may not) indicate that the object is an obstacle requiring the obstacle owner to appropriately light and/or mark. The Secretariat considers that these provisions provide an additional tool to the national authorities that increases safety by providing a means to require lighting and marking of hazards to aircraft where no means is currently provided.

ACTION PROPOSED

No change.

REFERENCE: Page A-27, paragraph 6.1.2.3

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Australia

Paragraph 6.1.2.3 - *Agreement with comments*

Comment:

Question to refer to ICAO: As this paragraph specifically refers to overhead wires, etc, outside obstacle limitation surfaces, should a trigger height be included?

Otherwise, this Recommendation will apply to ALL overhead wires etc. crossing rivers, waterways, valleys and highways, and to conduct an aeronautical study, and record the results for future reference, for each instance of such a crossing would be an impossibly large task.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

According to the definition of obstacle in Annex 14, objects of this type are considered obstacles, and thus a specification of this nature is not useful. To the contrary, it causes confusion because it gives the impression that they are not obstacles.

6.1.10 6.1.2.43 **Recommendation** – *Overhead wires, cables, etc., crossing a river, waterway, valley or highway should be marked and their supporting towers marked and lighted if an aeronautical study indicates that the wires or cables could constitute a hazard to aircraft.*

SECRETARIAT’S COMMENTS

The comment from **Australia** is noted. The Secretariat first notes that this is an existing paragraph for which the proposed amendment was the inclusion of “waterway” with the other potential visual routes of a river, valley or highway. The Secretariat notes however that the study of *all* objects outside the OLS is not indicated by the words of the provision. The Secretariat notes that the trigger height is provided in the first paragraph of the section in paragraph 6.1.2.1 (by reference to paragraph 4.3.2 that establishes 150 m as the trigger height above which all objects outside an OLS are obstacles). Paragraph 6.1.2.3 then applies to objects in the specific scenario described even if they do not extend to a height of 150 m or more. The Secretariat considers that the provisions of this paragraph should not now trigger mass aeronautical studies of these specific objects outside of an OLS any more than they have previously.

The comment from **France** is noted. Again, the Secretariat first notes that this is an existing paragraph for which the proposed amendment was the inclusion of “waterway” with the other potential visual routes of a river, valley or highway. The Secretariat further notes that these objects outside of an OLS and that extend to a height of less than 150 m are not considered obstacles unless they have been assessed as being a hazard to air navigation. The requirement that these objects need to be assessed as being a hazard to air navigation in order for them to be considered obstacles is an inherent part of the existing definition of an obstacle subpart c). (Note: Objects outside the OLS that extend to a height of 150 m or more above ground level are recommended to be considered as obstacles by paragraph 4.3.2.)

ACTION PROPOSED

No change.

REFERENCE: Page A-27, Section 6.2

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS**France**

(Note.— See appropriate partial language version of this AN-WP for original text.)

Since it has been placed in Chapter 6, “Visual Aids for Denoting Obstacles”, 6.2 should read “**6.2 Marking and/or lighting of objects obstacles**”.

In general, the term “object” should be replaced by the term “obstacle” throughout Chapter 6.2.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat notes the distinction between objects and obstacles and does not support the wholesale replacement of the word “object” with the word “obstacle” throughout paragraph 6.2. As previous, the Secretariat comments have demonstrated, objects need to be addressed as a larger category than obstacles when discussing the determination of an obstacle from a set of objects. Further, the Secretariat considers this to be long-standing language that needs to be studied during the current work item of the AP of substantial content changes to Chapter 6.

ACTION PROPOSED

No change.

REFERENCE: Page A-27, paragraph 6.2.1.1

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we specifically propose:

~~6.3.4~~ **6.2.1.1** The presence of ~~objects~~ **obstacles** which must be lighted, as specified in 6.1, shall be indicated by low-, medium- or high-intensity lights, or a combination of such lights.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat notes that the content of this paragraph was not proposed for amendment. The Secretariat further considers this to be long-standing language that needs to be studied during the current work item of the AP of substantial content changes to Chapter 6.

ACTION PROPOSED

No change.

REFERENCE: Page A-27, paragraph 6.2.1.2 and 6.2.1.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

Both amendments have no actual impact as paragraph 6.2.1.2 regroups some of the existing provisions, while paragraph 6.2.1.3 intends to clarify the existing provision.

SECRETARIAT'S COMMENTS

The comments from **Cyprus, Ireland and Italy** are noted and supported.

ACTION PROPOSED

No change.

REFERENCE: Page A-27, paragraph 6.2.1.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**France**

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we specifically propose:

~~6.3.22~~ 6.2.1.3 The number and arrangement of low-, medium- or high-intensity obstacle lights at each level to be marked shall be such that the ~~object~~ **obstacle** is indicated from every angle in azimuth. Where a light is shielded in any direction by another part of the ~~object~~ **of this obstacle**, or by an adjacent object, additional lights shall be provided on that ~~adjacent object~~ **or on the part of the obstacle** that is ~~shielding the light~~, in such a way as to retain the general definition of the ~~object~~ **obstacle** to be lighted. If the shielded light does not contribute to the definition of the ~~object~~ **obstacle** to be lighted, it may be omitted.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat considers this to be long-standing language that needs to be studied during the current work item of the AP of substantial content changes to Chapter 6.

ACTION PROPOSED

No change.

REFERENCE: Page A-27, paragraph 6.2.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Cyprus
Ireland
Italy**

Paragraph 6.2.2 rationalises the use of flags by making explicit the possibility to use flags for mobile objects too, while the changes to paragraph 6.2.2.8 are the results of the of regrouping/rewording of existing provisions with no actual impact.

SECRETARIAT'S COMMENTS

The comments from **Cyprus, Ireland** and **Italy** are noted and supported.

ACTION PROPOSED

No change.

REFERENCE: Page A-27 and A-28 paragraph 6.2.2.2 and 6.2.2.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Spain

(Note.— See appropriate partial language version of this AN-WP for original text.)

The specifications contained in these paragraphs with regard to *the marking of mobile objects by flags* are totally outdated.

We see a need for Annex 14 to include a provision whereby vehicles with rotating lights in the movement area are not required to have such flags.

SECRETARIAT'S COMMENTS

The comment from **Spain** is noted. The Secretariat considers that the actual paragraph that establishes the requirement for vehicles to be marked by flags regardless of lighting is paragraph 6.2.2.1. The Secretariat notes that this paragraph was not proposed for amendment by the State letter but recognizes the need to update the provisions of Chapter 6. The current proposal amendment proposal primarily demonstrates the re-structuring proposed for Chapter 6. A work programme item to address substantial content changes is included in the AP's current work cycle.

ACTION PROPOSED

No change.

REFERENCE: Page A-28, paragraph 6.2.2.5

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

In this specification, only the obstacles should be taken into consideration, not all of the vehicles or the other mobile objects. We propose:

6.2.2 Mobile objects obstacles

6.3.4 6.2.2.5 Low intensity obstacle lights, Type C, shall be displayed on mobile obstacles such as vehicles and other mobile objects excluding aircraft.

Note. – See Annex 2 for lights to be displayed by aircraft.

SECRETARIAT’S COMMENTS

The comment from **France** is noted. The Secretariat notes that the content of this paragraph was not proposed for amendment. The Secretariat further considers this to be long-standing language that needs to be studied as part of substantial content changes to Chapter 6 during the current work cycle of the AP.

ACTION PROPOSED

No change.

REFERENCE: Page A-28, paragraph 6.2.2.8

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we specifically propose:

~~6.3.28~~ 6.2.2.8 Low intensity obstacle lights on ~~objects~~ obstacles with limited mobility such as aerobridges shall be fixed-red, and as a minimum be in accordance with the specifications for low-intensity obstacle lights, type A, in table 6-3. The intensity of the lights shall be sufficient to ensure conspicuity considering the intensity of the adjacent lights and the general levels of illumination against which they would normally be viewed.

SECRETARIAT’S COMMENTS

The comment from **France** is noted. The Secretariat notes that the proposal of the comment is not in regard to the content of this paragraph that was proposed for amendment. The Secretariat further considers this to be long-standing language that needs to be studied as part of substantial content changes to Chapter 6 during the current work cycle.

ACTION PROPOSED

No change.

REFERENCE: Page A-28, Section 6.2.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

6.2.3 Fixed ~~objects~~ obstacles

Marking

~~6.2.4~~ 6.2.3.1 All fixed ~~objects~~ obstacles to be marked shall, whenever practicable, be coloured, but if this is not practicable, markers or flags shall be displayed on or above them, except that ~~objects~~ obstacles that are sufficiently conspicuous by their shape, size or colour need to be otherwise marked.

Switzerland

ICAO should add a note referring within the Annex to the proposed new paragraphs 6.2.4 (wind turbines) and 6.2.5 (overhead wires, cables), because these are fixed obstacles too, but treated separately due to their specific characteristics.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat notes that the content of this paragraph was not proposed for amendment. The Secretariat further considers this to be long-standing language that needs to be studied as part of substantial content changes to Chapter 6 during the current work cycle of the AP.

The comment from **Switzerland** is noted and supported as providing useful information to an unfamiliar reader.

ACTION PROPOSED

Add a Note to paragraph 6.2.3 to read as follows”:

6.2.3 Fixed objects

Note.- The fixed objects of wind turbines are addressed separately in 6.2.4 and the fixed objects of overhead wires, cables, etc. and supporting towers are addressed separately in 6.2.5.

REFERENCE: Page A-28, paragraph 6.2.3.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we specifically propose:

~~6.2.3~~ **6.2.3.2 Recommendation** – An ~~object~~ **obstacle** should be coloured to show a chequered pattern if it has essentially unbroken surfaces and its projection on any vertical plane equals or exceeds 4.5 m in both dimensions. The pattern should consist of rectangles not less than 1.5 m and not more than 3 m on a side, the corners being of the darker colour. The colours of the pattern should contrast each with the other and with the background against which they will be seen. Orange and white or alternatively red and white should be used, except where such colours merge with the background. (see figure 6-1).

~~6.2.4~~ **6.2.3.3 Recommendation** – An ~~object~~ **obstacle** should be coloured to show alternating contrasting bands if:

- a) it has essentially unbroken surfaces and has one dimension, horizontal or vertical, greater than 1.5 m, and the other dimension, horizontal or vertical, less than 4.5 m; or
- b) it is of skeletal type with either a vertical or a horizontal dimension greater than 1.5 m.

The bands should be perpendicular to the longest dimension and have a width approximately 1/7 of the longest dimension or 30 m, whichever is less. The colours of the bands should contrast with the background against which they will be seen. Orange and white should be used, except where such colours are not conspicuous when viewed against the background. The bands on the extremities of the object should be of the darker colour. (see figure 6-1 and 6-2).

Note – Table 6-1 shows a formula for determining band widths and for having an odd number of bands, thus permitting both the top and bottom bands to be of the darker colour.

~~6.2.5~~ **6.2.3.4 Recommendation** – An ~~object~~ **obstacle** should be coloured in a single conspicuous colour if its projection on any vertical plane has both dimensions less than 1.5 m. Orange or red should be used, except where such colours merge with the background.

Note – Against some backgrounds it may be found necessary to use a different colour from orange or red to obtain sufficient contrast.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat notes that the content of these paragraphs was not proposed for amendment. The Secretariat further considers this to be long-standing language that needs to be studied as part of substantial content changes to Chapter 6 during the current work cycle of the AP.

ACTION PROPOSED

No change.

REFERENCE: Page A-29, paragraph 6.2.3.5

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we specifically propose:

~~6.2.11~~ **6.2.3.5** Flags used to mark ~~fixed objects~~ **obstacles** shall be displayed around, on top of, or around the highest edge of the ~~object~~ **obstacle**. When flags are used to mark extensive ~~objects~~ **obstacles** or a

group of closely spaced ~~objects~~ **obstacles**, they shall be displayed at least every 15 m. Flags shall not increase the hazard presented by the ~~object~~ **obstacle** they mark.

~~6.2.12~~ **6.2.3.6** Flags used to mark fixed ~~objects~~ **obstacles** shall not be less than 0.6 m square ~~on each side~~ **on each side** and ~~flags used to mark mobile objects, not less than 9 m square.~~

~~6.2.14~~ **6.2.3.7** Recommendation – *Flags used to mark fixed ~~mobile objects~~ **obstacles** should be orange in colour or a combination of two triangular sections, one orange and the other white, or one red and the other white, except that where such colours merge with the background, other conspicuous colours should be used.*

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat notes that the proposal of the comment is not in regard to the content of the paragraph that was proposed for amendment. The Secretariat further considers this to be long-standing language that needs to be studied as part of substantial content changes to Chapter 6 during the current work cycle of the AP.

ACTION PROPOSED

No change.

REFERENCE: Page A-29, paragraph 6.2.3.7

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

ACI

Subcategories of flag can confuse the identification of the signals by pilots. The orange and red flags should be sufficient in order to provide good visual information for airside users.

SECRETARIAT'S COMMENTS

The comment from **ACI** is noted. The Secretariat supports referral of the further study of flags to the AP as part of the current work programme item addressing substantial content changes to Chapter 6, but does not support any immediate changes to the amendment proposal in the State letter.

ACTION PROPOSED

Refer the further study of flags to the AP as part of the current work programme item addressing substantial content changes to Chapter 6.

REFERENCE: Page A-29, paragraph 6.2.3.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we propose specifically:

~~6.2.7~~ **6.2.3.8** Markers displayed on or adjacent to ~~objects~~ **obstacles** shall be located in conspicuous positions so as to retain the general definition of the ~~object-obstacle~~ and shall be recognizable in clear weather from a distance of at least 1000 m for an ~~object~~ **obstacle** to be viewed from the air and 300 m for an object to be viewed from the ground in all directions in which an aircraft is likely to approach the ~~object-obstacle~~. The shape of markers shall be distinctive to the extent necessary to ensure that they are not mistaken for markers employed to convey other information, and they shall be such that the hazard presented by the ~~object-obstacle~~ they mark is not increased.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat notes that the content of this paragraph was not proposed for amendment. The Secretariat further considers this to be long-standing language that needs to be studied as part of substantial content changes to Chapter 6 during the current work cycle of the AP.

ACTION PROPOSED

No change.

REFERENCE: Page A-30, paragraph 6.2.3.12 (the following references were also cited by Cyprus, Ireland and Italy but actionable comments were only provided in regard to paragraph 6.2.3.12: Page A-29 paragraphs 6.2.3.6 and 6.2.3.7, Page A-30 paragraphs 6.2.3.10, 6.2.3.11, 6.2.3.12, 6.2.3.13, 6.2.3.15, Page A-31 paragraphs 6.2.3.16, 6.2.3.17, 6.2.3.22, 6.2.3.23, Page A-32 paragraphs 6.2.3.30, 6.2.3.31, Page A-33, paragraphs 6.2.3.32, 6.2.3.33)

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Australia

Agreement with comments

Comment:

With the words shown as being deleted, this paragraph does not make sense.

Belgium

The part of the text that is proposed to be deleted is not correct.

We propose:

6.2.3.12. In the case of a tower or antenna structure indicated by high-intensity obstacle lights by day with an appurtenance, such as a rode or an antenna, greater than 12m ~~where it is not practicable to located a high intensity obstacle light on top of the appurtenance~~, such a light shall be located at the highest practicable point and, if practicable, a medium-intensity obstacle light, type A, mounted on the top.

Cyprus Ireland Italy

The proposed change intends to improve the readability of the text and to rationalise the application of obstacle lighting, especially with regard to Type A obstacle lights (paragraph 6.2.3.30), which may be used in the vicinity of an aerodrome, only if they do not dazzle pilots or cause significant environmental concerns; it is considered as a safety enhancement. However, the proposed text for paragraph 6.2.3.12 is not fully understood as there are three uses of “practicable” in juxtaposition, while the verb of the sentence is missing and therefore, without the necessary clarification of the meaning, a view is not possible to be expressed.

Liberia

Liberia CAA recommend that 6.2.3.12 be rephrased.

Singapore

Singapore would like to highlight that paragraph 6.2.3.12 seems incomplete, and is neither written as a Standard or an RP.

United Arab Emirates

Review the wording of the change regarding tower or antenna structures.

IFALPA

IFALPA believes that the proposed deleted text is has been made in error and would suggest this paragraph is reviewed again.

SECRETARIAT'S COMMENTS

The comments from **Australia, Belgium, Liberia, Singapore, United Arab Emirates** and **IFALPA** are noted and supported. The Secretariat notes that the current attempt to simplify paragraph 6.2.3.12 has resulted in a sentence that does not flow properly.

The comments by **Cyprus, Ireland** and **Italy** are noted. The Secretariat does not consider the problem to be the use of the word “practicable” where appropriate, but considers the problem to be in part because the operative word “shall” has been inadvertently struck.

The Secretariat proposes the reinstatement of the content of proposed paragraph 6.2.3.12 to its current working in existing paragraph 6.3.13 pending further review under the current AP work programme item of updating the content of Chapter 6.

ACTION PROPOSED

Amend proposed paragraph 6.2.3.12 to read as follows:

~~6.3.13~~ **6.2.3.12** In the case of a tower or antenna structure indicated by high-intensity obstacle lights by day with an appurtenance, such as a rod or an antenna, greater than 12 m where it is not practicable to locate a high-intensity obstacle light on top of the appurtenance, such a light shall be located at the highest practicable point and, if practicable, a medium-intensity obstacle light, Type A, mounted on the top.

REFERENCE: Page A-30, paragraph 6.2.3.13

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we specifically propose:

~~6.3.14~~ **6.2.3.13** In case of an extensive ~~object~~ **obstacle** or a group of closely spaced ~~objects~~ **obstacles** to be lighted that are:

- a) penetrating a horizontal OLS or located outside an OLS, the top lights shall be so arranged as to at least indicate the points or edges of the object highest in relation to the obstacle limitation surface or above the ground, and so as to indicate the general definition and the extent of the ~~objects~~ **obstacles**; and
- b) penetrating a sloping OLS the top lights shall be so arranged as to at least indicate the points or edges of the object highest in relation to the obstacle limitation surface, and so as to indicate the general definition and the extent of the ~~objects~~ **obstacles**. If two or more edges are of the same height, the edge nearest the landing area shall be marked.

~~6.3.15~~ **6.2.3.14 Recommendation** - *When the obstacle limitation surface concerned is sloping and the highest point above the obstacle limitation surface is not the highest point of the ~~object~~ **obstacle**, additional obstacle lights should be placed on the highest point of the ~~object~~ **obstacle**.*

6.2.3.15 Where lights are applied to display the general definition of an extensive ~~object~~ **obstacle** or a group of closely spaced objects **obstacles**, and

- a) low-intensity lights are used, they shall be spaced at longitudinal intervals not exceeding 45m.
- b) medium-intensity lights are used, they shall be spaced at longitudinal intervals not exceeding 900m.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat notes that the proposal of the comment is not in regard to the content of the paragraph that was proposed for amendment. The Secretariat further considers this to be long-standing language that needs to be studied as part of substantial content changes to Chapter 6 during the current work cycle of the AP.

ACTION PROPOSED

No change.

REFERENCE: Page A-30, paragraph 6.2.3.15

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Chile

(Note.— See appropriate partial language version of this AN-WP for original text.)

COMMENT: We would like to have a clear definition of *extensive*.

SECRETARIAT'S COMMENTS

The comment from **Chile** is noted. The Secretariat notes that the intent of the comment can more appropriately be considered a request for a definition of an *extensive object*, as the definition of *extensive* would be a matter of referring to the Concise Oxford English Dictionary. The Secretariat notes that this is existing language used, for example, in existing paragraph 6.3.14. There is also an existing note following existing paragraph 6.3.7 (relocated with the paragraph to new 6.2.3.22) that reads: “*Note.- A group of ~~trees or~~ buildings is regarded as an extensive object.*” The Secretariat considers therefore that an *extensive object* is an established enough concept within Annex 14 that this proposed amendment should proceed, with a referral to the AP of the study of whether or not this concept needs to be expanded upon.

ACTION PROPOSED

Refer the study of whether or not the concept of an extensive object needs to be expanded upon to the AP.

REFERENCE: Page A-30, paragraph 6.2.3.15 (b)

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Dominican Republic

(Note.— See appropriate partial language version of this AN-WP for original text.)

We would like to draw your attention to Chapter 6, 6.2.3.15 (b) of Annex 14, where the requirement is being proposed for lights to display the general definition of an extensive object or a group of closely spaced objects. Paragraph (a) stipulates that low-intensity lights are to be placed at longitudinal intervals not exceeding 45m, whereas paragraph (b) proposed using medium-intensity lights spaced at longitudinal intervals not exceeding 900m. The difference in the longitudinal spacing proposed in each of these paragraphs, between 45m and 900m, seems excessive to us. We wish to point this out and suggest that the figures be checked, in case it is an editorial mistake that might significantly affect the meaning of the text.

The Civil Aviation Institute of the Dominican Republic has notified its approval of the amendment, but on second reading we noticed this apparent discrepancy, and thought good to flag it in case it is a mistake.

SECRETARIAT'S COMMENTS

The comment from the **Dominican Republic** is noted. The Secretariat notes that the provisions in question come from existing paragraph 6.3.14 without any changes proposed. This is shown in the Rationale box at the end of the Chapter 6 proposed amendments in the State letter on page A-43, second entry up from the bottom of the page.

ACTION PROPOSED

No change.

REFERENCE: Page A-30, paragraph 6.2.3.15 b) and Section 6.2.4 Wind Turbines

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Germany

Disagreement with comments

The interval of 900 m is not supported, especially for wind farms. It contradicts VFR under which a lateral distance of 150 m to obstacles is required. Thus, VFR lateral distances to obstacles have to be considered when determining intervals between obstacle lights.

In general, the current wind farm marking and lighting requirements - especially 6.2.4 a) and b) - do not take into account the extensive size of projects, e.g. in German waters.

United Kingdom

6.3.14 There is an error in the text. Lights should be 90 m apart not 900 m as in the proposal and current version.

There is one request for confirmation that **Fig 6-3** is not being deleted or whether the title is just being changed.

SECRETARIAT'S COMMENTS

The comments from **Germany** and the **United Kingdom** are noted. The Secretariat notes that the 900 m is an existing provision not proposed for change that comes from existing paragraph 6.3.14. This is shown in the Rationale box at the end of the Chapter 6 proposed amendments in the State letter on page A-43, second entry up from the bottom of the page. The Secretariat notes further that the 900 m value goes back to the First Edition of Annex 14 dated 1951. Until the 7th Edition (inclusive) dated 1976, the 900 m value was accompanied with the additional information “(3000 ft)”. This detail and longevity of the existence of this value makes it unlikely that it is a typographical error.

The Secretariat does not consider that the purpose or the goal of obstacle lighting is the identification of the operational limits of VFR and therefore no link to VFR limits is required. Human factors issues are considered in regard to the science of lighting to assure recognition of an obstacle, extensive obstacle, or group of obstacles by a flight crew, not to visually display VFR limits. In regard to the comment on paragraph 6.2.4, the Secretariat notes that the work of the AP on wind turbines is a current work programme item that continues to be addressed within the relevant working group.

In regard to the deletion of Figure 6-3, the Secretariat notes that the AP (and its relevant working group) concluded that the existing Figure 6-3 required enough adaptation that it should not remain in Annex 14. The adaptation of this figure is being considered as part of the current work programme item of the AP to draft substantial content changes to Chapter 6.

ACTION PROPOSED

No change.

REFERENCE: Page A-31, paragraph 6.2.3.19

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we specifically propose:

~~Objects~~ obstacles with a height less than 45m above the level of the surrounding ground

6.3.2 6.2.3.19 Recommendation – Low-intensity obstacle lights, Type A or B, should be used where the **object** ~~obstacle~~ is a less extensive one and its height above the surrounding ground is less than 45 m.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The Secretariat considers this to be long-standing language that needs to be studied during the current work item of the AP of substantial content changes to Chapter 6.

ACTION PROPOSED

No change.

REFERENCE: Page A-31, paragraph 6.2.3.19 to 6.2.3.33

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Australia**

The proposed heading "**Objects which height exceeds 150 m above ground level or the level of the surrounding ground**" should use the same form of wording as the two previous headings. Is there intended to be a difference of meaning between "ground level" and "level of surrounding ground"? If there is, it should be explained.

Switzerland

All these articles deal with the lighting of obstacles. In this respect, ICAO should add the wording "lighting of..." at the beginning of the respective titles on pages A-31 and A-32.

SECRETARIAT'S COMMENTS

The comments from **Australia** and **Switzerland** are noted and supported as providing additional consistency and precision.

ACTION PROPOSED

Amend the section headings immediately prior to new proposed paragraphs 6.2.3.19, 6.2.3.23 and 6.2.3.28 to read as follows, respectively:

Lighting of objects with a height less than 45 m above ground level

Lighting of objects with a height 45 m to a height less than 150m above ground level

Lighting of objects with a height 150 m or more above ground level

REFERENCE: Page A-31, paragraph 6.2.3.22

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**France**

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we specifically propose:

~~6.3.7~~ **6.2.3.22 Recommendation** – *Medium-intensity obstacle lights, Type A, B or C, should be used where the ~~object~~ obstacle is an extensive one ~~or its height above the level of the surrounding ground is greater than 45 m.~~ . Medium-intensity obstacle lights, Types A and C, should be used alone, whereas medium intensity obstacle lights, Type B, should be used either alone or in combination with low-intensity obstacle lights, Type B.*

*Note – A group of ~~trees or~~ buildings is **may be** regarded as an extensive object.*

SECRETARIAT’S COMMENTS

The comment from **France** is noted. The Secretariat considers the comment in regard to “object” versus “obstacle”. The Secretariat further considers this to be long-standing language that needs to be studied as part of substantial content changes to Chapter 6 during the current work cycle of the AP.

The Secretariat does not support the change from “is” to “may be” pending the AP study (also proposed earlier) of whether or not the concept of *extensive objects* needs to be expanded upon.

ACTION PROPOSED

Refer the study of whether or not the concept of an extensive object needs to be expanded upon to the AP.

REFERENCE: Page A-31, Note following paragraph 6.2.3.22

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

United Arab Emirates

What is the rationale behind removing "trees" from the notes?

SECRETARIAT’S COMMENTS

The comment from the **United Arab Emirates** is noted. The rationale behind the removal of “trees” from the Note is that trees are not proposed for marking or lighting, but are typically topped (the top part creating a hazard is cut off) or removed completely, and they therefore do not need to be addressed in these provisions.

ACTION PROPOSED

No change.

REFERENCE: Page A-31, Sentence following the Note following paragraph 6.2.3.22

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we specifically propose:

~~Objects~~ **Obstacles** with a height not more than 150 m but not less than 45m above the level of the surrounding ground.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. While this is a new heading being proposed to support the restructuring of Chapter 6, the Secretariat considers the word “object” used here as providing consistency with long-standing language that needs to be studied as part of substantial content changes to Chapter 6 during the current work cycle of the AP.

ACTION PROPOSED

No change.

REFERENCE: Page A-32, Sentence following paragraph 6.2.3.27

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Along the same lines as the comment relating to 6.2, we specifically propose:

~~Objects~~ **Obstacles** which height exceeds 150 m above ground level or the level of the surrounding ground

SECRETARIAT'S COMMENTS

The comment from **France** is noted. While this is a new heading being proposed to support the restructuring of Chapter 6, the Secretariat considers the word “object” used here as providing consistency with long-standing language that needs to be studied as part of substantial content changes to Chapter 6 during the current work cycle of the AP.

ACTION PROPOSED

No change.

REFERENCE: Page A-32, Sentence following paragraph 6.2.3.27 and 6.2.3.29

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Republic of Moldova

(Note.— See appropriate partial language version of this AN-WP for original text.)

The new paragraph 6.2.3.29 repeats paragraph 6.2.3.27 verbatim. If the latter needs to be read, a reference thereto can be inserted.

SECRETARIAT'S COMMENTS

The comment from the **Republic of Moldova** is noted. The Secretariat notes that both paragraphs have the same original existing paragraph 6.3.19 as their origin. This can be seen in the Rationale box at the end of the proposed amendments for Chapter 6 in the State letter on page A-44, fourth item from the top of the page. The reason for its duplication is that it applies to the two different sections dealing with different heights created under the re-structuring.

ACTION PROPOSED

No change.

REFERENCE: Page A-32 paragraph 6.2.3.30

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Germany

In principle, Germany supports the approach of the recommendation in 6.2.3.30.

The wording should be re-arranged. Environmental concerns as well as potential influences on the pilots should be based on the common understanding of the different stakeholders.

Singapore

Singapore would like to highlight that the text “where an object is indicated by MI lights” appears to have been inadvertently omitted in paragraph 6.2.3.30.

SECRETARIAT’S COMMENTS

The comment from **Germany** is noted. The Secretariat first notes that no specific proposals as to how the wording should be re-arranged was provided. The Secretariat notes that the current wording is clear and supports the proposal going forward as written.

The comment from **Singapore** is noted. The Secretariat notes that the original (existing) paragraph 6.3.7 does not contain the words identified in the comment above as being inadvertently omitted.

ACTION PROPOSED

No change.

REFERENCE: Page A-33 paragraph 6.2.4.1, Page A-34, paragraphs 6.2.5.1, 6.2.5.2, Page A-35, paragraph 6.2.5.11, Page A-36, paragraph 6.2.5.12

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Cyprus
Ireland
Italy

With regard to paragraph 6.2.4.1, there is a clear safety benefit arising from its introduction, without imposing a disproportionate burden. In addition, the introduction of paragraph 6.2.5.1 has an associated safety benefit, while the amendments to paragraphs 6.2.5.2, 6.2.5.11 and 6.2.5.12 reflect the result of the restructuring/rewording of the relevant provisions without an associated impact.

SECRETARIAT’S COMMENTS

The comments from **Cyprus, Ireland** and **Italy** are noted and supported.

ACTION PROPOSED

No change.

REFERENCE: Page A-33, paragraph 6.2.4.1A

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Republic of Moldova

(Note.— See appropriate partial language version of this AN-WP for original text.)

Delete the letter “A” from paragraph number 6.2.4.1A.

SECRETARIAT'S COMMENTS

The comment from the **Republic of Moldova** is noted. The Secretariat notes that the “A” referred to is not associated with the paragraph numbering but is the first word of the standard itself – “A wind turbine shall be marked...”

ACTION PROPOSED

No change.

REFERENCE: Page A-34, paragraph 6.2.5.1

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Switzerland

The suggested Recommendation is not implementable to supporting towers.

We suggest to exclude supporting towers from this paragraphs.

SECRETARIAT'S COMMENTS

The comment from **Switzerland** is noted but not supported. The Secretariat notes that towers that support overhead wires and cables create obstacles that are ubiquitous globally and they need to be addressed.

ACTION PROPOSED

No change.

REFERENCE: Page A-34, paragraph 6.2.5.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The aim is not to mark all of the supporting towers, but rather only those considered to be obstacles. We propose:

~~6.1.10 6.2.5.2 Recommendation - Overhead wires, cables, etc., crossing a river, valley or highway should be marked and their supporting towers marked and lighted if an aeronautical study indicates that the wires or cables could constitute a hazard to aircraft.~~ The supporting towers of overhead wires, cables, etc. that require marking should be marked in accordance with 6.2.3.1 to 6.2.3.4, except that the marking of the supporting towers may be omitted when they are lighted by high-intensity obstacle lights by day.

SECRETARIAT'S COMMENTS

The comment from **France** is noted and supported as providing increased precision in the provision.

ACTION PROPOSED

Amend proposed paragraph 6.2.5.2 to read as follows:

6.1.10 6.2.5.2 **Recommendation** - ~~Overhead wires, cables, etc., crossing a river, valley or highway should be marked and their supporting towers marked and lighted if an aeronautical study indicates that the wires or cables could constitute a hazard to aircraft.~~ The supporting towers of overhead wires, cables, etc. that require marking should be marked in accordance with 6.2.3.1 to 6.2.3.4, except that the marking of the supporting towers may be omitted when they are lighted by high-intensity obstacle lights by day.

REFERENCE: Page A-35, Note to paragraph 6.2.5.10

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Germany**

Germany proposes to re-word and legally review the new wording of the *Note* to 6.2.5.10.

Germany proposes to also address environmental issues.

SECRETARIAT'S COMMENTS

The comment from **Germany** is noted. The Secretariat notes that the Note to 6.2.5.10 is an existing Note to existing 6.3.1. The tracking of the relocation of this Note can be seen in the Rationale box that follows the proposed amendments to Chapter 6 in the State letter on page A-42, last item on the bottom of the page.

ACTION PROPOSED

No change.

REFERENCE: Page A-37, Figure 6-2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Australia**

Agreement with comments

Comment:

The Figure shows 6.2.3.13 as being the paragraph about lights near the top of a chimney, when in fact it should be 6.2.3.11.

SECRETARIAT'S COMMENTS

The comment from **Australia** is noted and supported.

ACTION PROPOSED

Amend the reference in Figure 6-2 from “6.2.3.13” to “6.2.3.11”.

REFERENCE: Page A-38, Table 6-3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Australia

Agreement with comments

Comment:

- The concept of "Benchmark intensity" should be explained.
- Low-intensity Type C (mobile obstacles). In the "Day" column, N/A is shown. In fact, emergency and similar vehicles display their flashing lights by day and night, so the inclusion of "Not Applicable" in this intensity table is misleading and inappropriate.

SECRETARIAT'S COMMENTS

The comments from **Australia** are noted. The Secretariat notes that the intensity levels shown in the proposed Table 6-3 as “Benchmark intensity” are listed as “Peak intensity” in the existing Table 6-3. The Secretariat considers that there is no clear safety reason to introduce a new technical term that is primarily meaningful only to lighting specialists and proposes that Table 6-3 retain the current terminology of “Peak intensity”.

The Secretariat notes that proposed paragraph 6.1.1.1 (existing paragraph 6.1.6) states inter alia “Vehicles and other mobile objects...shall be marked and, if the vehicles and aerodrome are used at night or in conditions of low visibility, lighted...” As lighting is only required at night or in conditions of low visibility the entry of “N/A” in the “Day” column is correct.

ACTION PROPOSED

Amend the relevant part of Table 6-3 to read as follows:

“~~Benchmark~~ Peak intensity (cd) at given Background Luminance (b)”

REFERENCE: Page A-38 Table 6-3, Page A-39 Table 6-X, Page A-40 Table 6-Y

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Cyprus
Ireland
Italy

The propose change to Table 6-3 is understood not to be safety related.

SECRETARIAT’S COMMENTS

The comment from **Cyprus, Ireland** and **Italy** are noted and supported. The Secretariat agrees that the proposed changes do not affect safety and considers that the proposed changes to Table 6-3 should go forward.

ACTION PROPOSED

No change.

REFERENCE: Page A-38, Figure 6-3

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Switzerland

This Figure is suggested to be deleted.
We consider this Figure as helpful. The Figure has to be adapted according to the text.

SECRETARIAT’S COMMENTS

The comment from **Switzerland** is noted. The Secretariat agrees that existing Figure 6-3 needed to be adapted. The AP (and its relevant working group) concluded that the existing Figure 6-3 required enough adaptation that it should not remain in Annex 14. The adaptation of this Figure is being considered as part of the current work programme item of the AP to draft substantial content changes to Chapter 6.

ACTION PROPOSED

No change.

REFERENCE: Page A-46, paragraph 9.1.13

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Chile

(Note.— See appropriate partial language version of this AN-WP for original text.)

COMMENT: In paragraphs (a) and (b), the phrase 'modular tests [with] a full-scale emergency exercise [at intervals] not exceeding three years' is not clear. The proposal indicates that there are ten modules over the three-year time period, but does not specify which ones.

Cyprus

Ireland

Italy

Paragraph 9.1.13 introduces an alternative to the 2 years interval required between 2 full scale field emergency exercises. The rationale behind this proposal to conduct a series of modular tests and a full scale field exercise over a 3 years period is the difficulty of some States to organise a full scale field exercise, because some emergency agencies that should be involved in the exercise, were unable and/or unwilling to participate. The purpose of the full scale field exercise, except for testing individual procedures and equipment, is mainly to test the effectiveness of the coordination and communications between the agencies involved in an emergency. By conducting full scale field exercises every 2 years, the involved agencies have the opportunity to test their coordination procedures and communication more frequently and to correct any identified deficiencies sooner. Therefore the option of having full scale emergency exercises every 3 years seems not to provide the same possibilities for testing full scale coordination between the agencies involved.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The possibility to have modular tests is beneficial, and note 1 clarifies the differences among the various exercises and tests.

It is cumbersome and expensive to carry out full-scale exercises, and combining modular tests with partial emergency exercises enables any possible deficiencies to be more readily identified. Indeed, it does not appear to be very advantageous to have maximum intervals of three years rather than two years without the modular tests. We propose to have maximum intervals of five years rather than three years.

9.1.13 The plan shall be tested by conducting:

a) a full-scale aerodrome emergency exercise at intervals not exceeding two years; and b) partial emergency exercises in the intervening year to ensure that any deficiencies found during the full-scale aerodrome emergency exercise have been corrected; ~~and or~~

b) a series of modular tests commencing in the first year and concluding in a full scale emergency exercise at intervals not exceeding ~~three~~ five years;

~~and~~ reviewed thereafter, or after an actual emergency, so as to correct any deficiency found during such exercises or actual emergency.

Note 1.— The purpose of a full-scale exercise is to ensure the adequacy of the plan to cope with different types of emergencies. The purpose of a partial exercise is to ensure the adequacy of the response to individual participating agencies and components of the plan, such as the communications system. The purpose of modular tests is to enable concentrated effort on specific components of established emergency plans.

Note 2.— Guidance material on airport emergency planning is available in the Airport Services Manual, Part 7.

Russian Federation

(Note.— See appropriate partial language version of this AN-WP for original text.)

Amend paragraph 9.1.13 whereby the proposed modular (autonomous) approach consisting of full-scale exercises every two years be replaced by modular (autonomous) exercises with full-scale exercises once every three years since the exercises conducted by individual teams of the Emergency Response Unit cannot replace the exercises of the entire Emergency Response Unit in which all the teams interact.

United States

Replace:

"two years" in 9.1.13.a with "three years"

Experience in the US has shown that aerodrome operators have difficulty, in terms of budget, personnel, and schedule availability, in performing a full-scale exercises every 2 years. It is anticipated that aerodrome operators world-wide would also experience this difficulty. Full-scale exercises occurring every three years, with smaller-scale, focused actions occurring inbetween, allow aerodrome staff to remain proficient in responding to emergencies while maximizing limited resources.

Insert a description of the 10 emergency modules

The 10 referenced emergency modules are not described

IFALPA

IFALPA understands the problems that some States are experiencing with conducting a full scale aerodrome emergency field exercise every two years and applauds the introduction of the modular tests as an alternative. However, IFALPA would prefer that States are encouraged to carry out the full scale exercise and would suggest that instead of giving them a simple either/or to add “or, when not possible”.

SECRETARIAT’S COMMENTS

Responding to the comments from **Chile, Cyprus, Ireland and Italy**, it is noted that in recent years civil contingency legislation has brought with it much greater demand on government departments, local authorities and each of the emergency responders to heighten their state of preparedness and to exercise numerous emergency plans. Aerodromes fall into this category and aerodrome operators often find themselves competing with other agencies for the same resources, making it more and more difficult to conduct a meaningful full-scale exercise at each aerodrome at two yearly intervals. This was experienced in at least three States represented in the Rescue and Fire Fighting Working Group (RFFWG) of the Aerodromes Panel.

The new proposal is comprised of a series of modules which, if completed over a period of time, would at least be equal to and, in most cases, supersede the current arrangement. The system of modularized tests would result in conducting numerous smaller and more detailed elements with a shorter time scale between each module. Commencing with the first module – “raising the alarm”, followed by other

modules e.g. “rendezvous point”, “operational command”, “medical services”, “tactical command”, “strategic command”, “airport reception centres/non-emergency services response”, “post disaster management”, “business recovery”, and finally leading to module 10 which calls for a live full-scale exercise. The period between modules would be organized locally and agreed with the national regulator; however, all modules would be completed within a period of three years. The modules would take into account practical tabletop and simulation exercises. Detailed guidance material for each module, including the aims, objectives, agencies involved and other pertinent issues to be considered, have already been developed. Upon adoption of the proposed amendment, this guidance will be incorporated in the next update of Doc 9137, *Airport Services Manual*, Part 7 — *Airport Emergency Planning*.

The proposal from **France** to increase the interval between full-scale emergency exercise using the modular concept from three to five years is noted but not supported as the effectiveness of a full-scale emergency exercise carried out once every five years, as compared to the current two years, could be lost.

The comment from the **Russian Federation** is unclear but seems to suggest replacing the existing biennial emergency exercise with a triennial exercise. The Secretariat disagrees with the suggestion as the proposed amendment in 9.1.13 provides an option rather than replacing the existing methodology.

The comment from the **United States** pertaining to the frequency of emergency exercise is noted but not supported. The proposal to amend the interval in 9.2.13a) from two years to three years is not part of the amendment proposed in the State letter. The proposal will be referred to the RFFWG for further study.

IFALPA prefers that States be encouraged to carry out full-scale exercises and, in this regard, suggests the replacement of the word “or”. The comment is noted but not supported since the modular concept also requires the conduct of a mandatory full-scale emergency exercise at the end of the modules.

ACTION PROPOSED

No change.

REFERENCE: Page A-47, paragraph 9.1.13 (b)

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Dominican Republic

(Note.— See appropriate partial language version of this AN-WP for original text.)

It should be possible to describe the modular tests, and list the ten most highly recommended ones in order of importance.

SECRETARIAT’S COMMENTS

The comment from **Dominican Republic** is noted. See the Secretariat’s earlier response above. The list of modules, as described, has no particular order of importance except for module 10 concerning full-scale emergency exercise which should be the last exercise in the modules. The sequence of testing should be determined by the aerodrome operator, in consultation with the regulator, to reflect their emergency planning priorities.

ACTION PROPOSED

No change.

REFERENCE: Page A-47, paragraph 9.1.15A

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

The proposed amendment introduced by paragraph 9.1.15A addresses the issue of conducting an assessment of the approach and departure areas within 1,000m of the runway threshold, in order to determine the options available for intervention. Considering the fact that many aerodromes are surrounded by difficult environments, it is very important for the aerodrome operator to have the appropriate specialist equipment, knowledge and/or training to deal with accidents at these areas. The assessment will support the aerodrome operator to identify the needs to deal with these accidents and will enhance its response and efficiency and therefore safety.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

This recommendation is not clear.

Firstly, the approach and departure areas are not defined. We assume that they are areas located below the inner approach surfaces and the take-off climb surfaces defined in Chapter 4 of Annex 14. While we agree that the term “approach area” is used in Chapter 5.3.5 with respect to visual approach indicators, it is not defined, and the term “departure area” does not appear in the Annex.

Furthermore, it is not clear to what assessment reference is being made.

Thus this recommendation should be clarified or, if clarification proves impossible, deleted.

The same applies to recommendation 9.2.30, which likewise uses the term “approach areas”.

Germany

Disagreement with comments

Against the background of the limited responsibility of the aerodrome operator outside the aerodrome fence, it is not appropriate to set a figure of 1,000 m.

Germany cannot guarantee the fulfillment of this recommendation.

SECRETARIAT'S COMMENTS

Comments from **Cyprus, Ireland and Italy** support the proposed amendment.

The comments from **France** are noted but not supported. Although not defined, the term “approach area” is used extensively in Annex 14, Volume I. In the context of 9.1.15A, the term “approach and departure areas” is written in plain language and is to be taken in a generic sense. However, there should not be any confusion since the qualification is on the words “within 1,000 m of the runway threshold”. See further response below from the Secretariat in relation to the comment on the reference to assessment. Concerning 9.2.30, the comment is noted, however, 9.2.30 as discussed in their comment was not part of the original amendment proposal in the State letter and, therefore, should not be considered at this stage.

Germany commented on the limited responsibility of the aerodrome operator outside the aerodrome fence. While this may be true for aerodromes located in congested areas where real estate is a premium, one of the requirements for an effective emergency plan is the need to coordinate and integrate with the different agencies and the community emergency response teams that could be of assistance in responding to an emergency. In this context, aviation safety transcends jurisdictional and agency differences. An assessment of the areas 1000 m of the runway threshold should be carried out to determine the options and facilities available for rescue, including suitable resources that should be provided. These resources and facilities need not be located on, or provided by, the aerodrome if they can be made available within reasonable times by off-aerodrome agencies as detailed in the aerodrome emergency plan. Other issues in the assessment include such considerations as the mitigation of impediments to responding emergency vehicles inside and outside of the fence. These include but are not limited to areas that may, from time to time, become impassable due to weather, issues associated with weight of vehicles and road conditions, frangible exit/access gates etc. Detailed guidance material concerning the assessment has already been developed and will be incorporated into the next update of Doc 9137 Parts 1 (RFF) and 9 (AEP).

ACTION PROPOSED

No change.

REFERENCE: Page A-48, paragraph 9.2.9

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium

More guidance material is needed concerning the composition of level C foam because the so called PFOS are forbidden in a number of States and since end June 2011 in the European Community.

Cyprus
Ireland
Italy

Paragraph (9.2.9) introduces performance Level C foam (9.2.9), which is a concentrate of Level B foam that requires less water for foam production, a lesser discharge rate and is more efficient in its extinguishing ability than Level B foam. Another benefit of using Level C foam is that fire vehicles can be reduced in size or by using the same fire vehicles, the fire fighting capability is increased. In that respect, the aerodrome operator will benefit in efficiency and financial terms, without degrading any safety standards.

Switzerland

The using of Level C foam has to be proved by the industry that it is no impact for the environment.

United States

In reference to "Type C" foams, modify the Airport Services Manual (Doc 9137), Part 1, by using the US Military Specification: MIL-F-24385

The US is concerned about the applicability of Type C foam requirements given that use of Type C foam is prohibited in a number of countries because of its environmental toxicity. Due to these concerns, the US proscribes the use of an equivalent (and more environmentally-friendly) agent, Military Specification: MIL-F-24385.

ACI

States which have not done their own fire tests may not be comfortable to authorize the new foam. All test results so far need to be shared, along with information on costs and suppliers of Level C foam.

SECRETARIAT'S COMMENTS

Referring to comments from **Belgium, Switzerland and the United States**, the Secretariat wishes to draw attention to existing specifications for performance levels A and B foams in Table 8-1, Doc 9137 Part 1. The specifications are performance based, specifying, among others, the pH value, viscosity, extinguishing times at preferred air and foam temperatures and wind velocity. These specifications do not specify the make-up of the foams nor any of its components. It is therefore up to the industry to use materials that are not banned in order to comply with the performance-based requirements. Equally, Table 8-1 will be expanded to include the new performance level C foam which is, in essence, a concentrate of performance level B foam which requires less water for foam production, a lesser discharge rate and is more efficient in its extinguishing ability than performance level B foam. The specifications already developed for level C foam include the need to comply with environmental requirements of the International Standard Organization (ISO) for fire-fighting foams.

As a performance-based Standard, any product that meets the standard must separately comply with local/national/regional environmental controls. As regards to PFOS stated by Belgium, it is noted that perfluorooctane sulfonates (PFOS) has been proven to be a persistent organic pollutant (POP) because its chemical group ($C_8F_{17}SO_2$) is highly persistent, bio-accumulative and toxic. The Secretariat is aware that in the European Union, PFOS is banned as from 27 June 2011 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0032:0034:EN:PDF>). Newer generations of performance levels A and B foams do not contain PFOS as required by law in the EU and similarly elsewhere. The various samples of level C foams that were tested at the Centre National de Prévention et de Protection (CNPP) in France and used during a large scale field test at Tyndall Air Force Base in Florida, United States did not contain PFOS in the foam concentrate.

The comments from **Cyprus, Ireland and Italy** support the proposed amendment and are noted.

The comment from **ACI** is noted and the relevant information will be included as guidance material.

ACTION PROPOSED

No change.

REFERENCE: Page A-48, paragraph 9.2.11

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

In relation to the agent substitution (9.2.11) the proposal is divided in two parts:

1. Replacement of water by complementary agent is only allowed for rescue and fire fighting category 1 and 2 aerodromes, which is more restrictive than the previous standard and therefore enhances safety; and
2. The quantity of complementary agent required to replace water for production of foam meeting performance level B is less, when compared with the previous provision, which is based on the information available is very difficult to assess in terms of safety benefit.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

It would be useful to make a clearer distinction between “complementary agent” and “substitution agent”.

It has to be made very clear that this substitution is possible only for level (not category) 1 and 2 aerodromes.

Moreover, the ratio of 1 kg of powder to 1 L of water must be used for type A foam only. Otherwise, Table 9-2 becomes useless for calculating substitution agents. Thus the quantity of the substitution complementary agent is calculated using the largest volume indicated in the appropriate category.

We propose:

9.2.11 The amounts of water for foam production and the complementary agents to be provided on the rescue and fire fighting vehicles shall be in accordance with the aerodrome ~~category~~ **level** determined under 9.2.3, 9.2.4, 9.2.5, 9.2.6 and Table 9-2, except that ~~these amounts may be modified as follows:~~

a) for aerodrome ~~categories~~ **levels** 1 and 2, up to 100 per cent of the water may be ~~replaced~~ **substituted** by complementary agent; ~~or~~

b) ~~for aerodrome categories 3 to 10 when a foam meeting performance level A is used, up to 30 per cent of the water may be replaced by complementary agent.~~

For the purpose of ~~this~~ agent substitution, 1 kg of complementary agent shall be ~~taken as equivalent to used for 1.0L of water for foam production of a foam meeting performance level A (Table 9-2).~~ the following equivalents shall be used:

1 kg
complementary
agent = 1.0 L water for production of a foam
meeting performance level A

1 kg
complementary
agent = 0.66 L water for production of a
foam meeting performance level B

Note 1.— The amounts of water specified for foam production are predicated on an application rate of 8.2 L/min/m² for a foam meeting performance level A, and 5.5 L/min/m² for a foam meeting performance level B and 3.75L/min/m² for a foam meeting performance Level C.

Note 2.— When any other complementary agent is used, the substitution ratios need to be checked.

SECRETARIAT’S COMMENTS

Comments from **Cyprus, Ireland and Italy** are noted.

Regarding comments from **France**, the Secretariat disagrees with the proposal to replace the term “aerodrome category” with “aerodrome level” since the former is already in use globally for many years without negative implications. The Secretariat, however, agrees with the other comments from **France** and 9.2.11 is accordingly modified.

ACTION PROPOSED

Amend 9.2.11 to read as follows:

9.2.11 The amounts of water for foam production and the complementary agents to be provided on the rescue and fire fighting vehicles shall be in accordance with the aerodrome category determined under 9.2.3, 9.2.4, 9.2.5, 9.2.6 and Table 9-2, except that ~~these amounts may be modified as follows:~~

a) for aerodrome categories 1 and 2, up to 100 per cent of the water may be ~~replaced by~~ substituted with complementary agent; ~~or~~

b) ~~for aerodrome categories 3 to 10 when a foam meeting performance level A is used, up to 30 per cent of the water may be replaced by complementary agent.~~

For the purpose of agent substitution, 1 kg of complementary agent shall be taken as equivalent to 1.0L of water for production of a foam meeting performance level A. ~~the following equivalents shall be used:~~

1 kg complementary agent = 1.0 L water for production of a foam meeting performance level A

1 kg complementary agent = 0.66 L water for production of a foam meeting performance level B

Note 1.— The amounts of water specified for foam production are predicated on an application rate of 8.2 L/min/m² for a foam meeting performance level A, and 5.5 L/min/m² for a foam meeting performance level B and 3.75L/min/m² for a foam meeting performance Level C.

Note 2.— When any other complementary agent is used, the substitution ratios need to be checked.

REFERENCE: Page A-49, paragraph 9.2.12

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

The proposed change to the note of paragraph 9.2.12, which provides additional guidance for the determination of the water and discharge rates, is considered not having any kind of impact.

France (Note after paragraph 9.2.12)

(Note.— See appropriate partial language version of this AN-WP for original text.)

The note in 9.2.12 should be reviewed.

In fact, the calculation of the quantities of water takes into consideration not only the overall length of the aeroplane in a given category, but also the width of the fuselage. These considerations apply to the aeroplane for which the rescue and fire fighting service is intended, not the aeroplane having the maximum length in the given category.

We propose:

Note.— ~~Additional guidance on the determination of quantities of water and discharge rates based on the largest overall length of aeroplane in a given category and on the width of the fuselage of the aeroplane for which the rescue and fire fighting service is intended~~ is available in Chapter 2 of the Airport Services Manual (Doc 9137), Part 1.

United States

Add:

Note.-- If it is determined that an increase in agent quantities is necessary, a resultant increase is the number of fire fighting vehicles or personnel is not also required.

The US is concerned about the impacts and justification underlying the January 2015 deadline to increase RFF agent quantities if aircraft exceed the average aircraft in a particular index. Potential increases in agent quantities do not necessarily require an increase in the number of fire fighting vehicles or personnel.

SECRETARIAT'S COMMENTS

Comments from **Cyprus, Ireland and Italy** are noted.

The comment from **France** is noted. It is correct that the calculation of water quantities takes into consideration not only the overall length of the aeroplane but also the fuselage width. This is already established as a Standard in 9.2.5 and 9.2.6 which categorize the aerodrome for rescue and fire fighting and, in turn, determines the quantities of extinguishing agents. The intent of the proposed amendment to the *Note* is to provide tables, as guidance, in Doc 9137 Part 1, including the formulae, showing the quantities of water and discharge rates calculated using the maximum theoretical values of aeroplane overall length and fuselage width in a given category. (See also France's comments next page.) Based on these tables, aerodrome operators and RFF service providers have an option to either adopt these maximum quantities or to recalculate based on the actual size of aeroplane envisaged at the aerodrome but

in any event must not be less than those indicated in Table 9-2, as required in 9.2.11. In this context, the Secretariat agrees with the proposal from France to amend the *Note* but with modifications, as shown below.

The proposal from **United States** to include a new *Note* is noted but not fully understood. The intent of the proposed note seems to be clarified in the last sentence of the second paragraph. The Secretariat does not support the inclusion since the determination of the minimum number of fire vehicles and personnel required is already specified in other SARPs. However, the proposed note and rationale provided by the United States will be referred to the RFFWG for inclusion as guidance material in Doc 9137, Part 1.

ACTION PROPOSED

Amend Note to 9.2.12 to read as follows:

Note.— ~~Additional~~ Guidance on the determination of quantities of water and discharge rates based on the largest theoretical aeroplane in a given category is available in Chapter 2 of the Airport Services Manual (Doc 9137), Part 1.

REFERENCE: Page A-49, paragraph 9.2.12A

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

Paragraph 9.2.12A requires aerodromes receiving aeroplanes larger than the median in each category to recalculate the quantities of water needed for foam production and the discharge rates for foam solution, thereby increasing the efficiency of the rescue and fire fighting services and enhancing safety.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

This specification is not clear and does not allow for the possibility of a remission factor.

It would have been simpler and clearer to have a table equivalent to Table 9-2 containing these quantities recalculated as a function of the theoretical aeroplanes having the maximum dimensions per category. This table would serve merely as a recommendation, given that such aeroplanes do not necessarily fly to the concerned aerodrome and that specification 9.2.12 already exists, which recommends that the quantities be recalculated if the aeroplanes accepted at the aerodrome are larger than the average size. Such a table had been presented to the Aerodrome Panel.

The comment concerning 9.2.12 likewise applies to 9.2.12.A.

Germany
Disagreement with comments

Germany objects to the date of applicability and fully supports AP/2 (1 January 2022).

A period of three years is too short to prepare for the change of RFF vehicles. Within 3 years, only a limited number of RFF vehicles can be changed. It is neither appropriate nor reasonable to implement a change of all RFF vehicles within such a short period of time. The provision of financial aid to support the acquisition of new equipment requires that the equipment is used for a minimum of 10 years.

ACI

The reference to “shall be increased accordingly” should be clarified.

ICCAIA

ICCAIA fully supports safety in all aspects of aviation but we feel that change of the 9.2.12 recommendation into a mandatory requirement as per 9.2.12A with a time frame of 1 Jan 2015 (requiring that airport RFF capabilities must be adapted to the highest length aircraft operating in any category on the airport and not to use the average of the category) will create a financial burden on many airports.

If one considers the history of RFF events, improved agent delivery systems and foams that are gradually being incorporated into RFF fleets worldwide, we have to wonder about the actual benefits that would be achieved by requiring increased RFF capacity on such a short notice.

Due to this reality, we suggest that the change to 9.2.12A should be established on a voluntary and gradual basis up to 2022, such that airports will be given at least ten years to improve their RFF capabilities, as opposed to an immediate application (by 1 January 2015 as suggested in the SL) that would create a financial burden that many airports will simply not be able to achieve.

We also feel that the rationale statement that precedes § 9.2.21A (on page A-50 of the State Letter) should have the phrase “, which has the capacity to carry greater amounts of fuel” should be removed as it is confusing when considered in light of the issue that is discussed in ~9.2.

SECRETARIAT’S COMMENTS

The Secretariat recalls that currently Table 9-2, Annex 14, Volume I, is computed based on the average overall length of aeroplanes in a given category. The use of Table 9-2 is mandated in 9.2.11, a Standard. Para 9.2.12, a recommendation, requires a recalculation of the quantities of water and discharge rates at aerodromes where operations by aeroplanes larger than the median size are planned. The Aerodromes Panel (AP), at its second meeting, endorsed a proposal to better clarify, by replacing, the term “should be increased accordingly” in 9.2.12 with the addition of “should not be less than that shown in Table 9-3” which is based on the largest dimensions of aeroplanes in a given category. Furthermore, AP/2 accepted a proposal to replace Table 9-2 in 9.2.11 with Table 9-3 as of 1 January 2022 based on justifications provided by its Rescue and Fire Fighting Working Group. These proposals are contained in AN-WP/8545.

The Commission, however, accepted the recommendation of its AN-WG/PDP that Table 9-3 not be a mandatory provision in 9.2.11. This was due to concerns that providing quantities of extinguishing agent based on the largest dimensions of aeroplanes irrespective of the type of aeroplanes actually using the

aerodrome, would seem to be excessively demanding. AN-WG/PDP further requested the Secretariat to draft proposed text that would upgrade existing 9.2.12 to a Standard with a protection date of 1 January 2015, including instructions on the usage of Table 9-2 and Table 9-3. Arising from this, the proposal to replace Table 9-2 in 9.2.11 with Table 9-3 is not supported, with the latter moved to Doc 9137 Part 1 as guidance material. A new Standard 9.2.12A has been developed, as per instruction of the Commission, which is an upgrade of the existing recommendation 9.2.12. Consequently, aerodromes receiving aeroplanes, irrespective of size, are required to provide quantities of water in accordance with Table 9-2 as per 9.2.11. However, they are required to recalculate the quantities of water and discharge rates if operations by aeroplanes larger than the median are planned, as per current recommendation 9.2.12 and as a Standard by 2015, as per the proposed 9.2.12A.

Comments from **Cyprus, Ireland and Italy** support the proposed amendment and are noted.

Regarding the comment from **France**, the remission factor in 9.2.3 remains unaltered. On the second comment from France concerning the availability of a table equivalent to Table 9-2 containing quantities recalculated as a function of the theoretical aeroplanes having the maximum dimensions per category, see the Secretariat's response above and on page B-126.

Concerning the comments from **Germany and ICCAIA**, the Secretariat recalled the origin of the proposed amendment in 9.2.12A which was first introduced as a *Note* to Table 9-2 in 2001, subsequently upgraded to a recommendation in 2009, and is now proposed by the Commission to be a Standard in 2015. States and aerodrome operators have fifteen years to prepare for the change. Furthermore, the proposal applies only to aerodromes that receive aeroplanes larger than the median size in a given category; for aerodromes receiving aeroplanes smaller than or equal to the median size, no change is anticipated. In addition, together with the potential economies achieved through using the more efficient performance level C foam, there may not be a need for acquisition of new vehicles or equipment, as implied in the comment from **Cyprus, Ireland and Italy** on page B-122.

See the Secretariat's response in paragraphs above concerning the comment from **ACI**.

ACTION PROPOSED

No change.

REFERENCE: Page A-49, paragraph 9.2.16

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

With regard to the conversion ratio of different performance level foams in paragraph 9.2.16, although necessary, no specific formula is given for the calculation and therefore additional guidance may be required.

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

This specification remains unclear. In fact, its purpose should be to determine the necessary quantities of extinguishing agent rather than to calculate a conversion ratio.

9.2.16 Recommendation.— ~~When both a foam meeting performance level A and a foam meeting performance level B are to be used, the total amount of water to be provided for foam production should first be based on the quantity which would be required if only a foam meeting performance level A were used, and then reduced by 3 L for each 2 L of water provided for the foam meeting performance level B. When different performance level foams having different performance levels are provided at an aerodrome the conversion ratio necessary quantities of extinguishing agent should be calculated for each foam type, and the distribution of these quantities should be documented for each vehicle. This procedure shall apply for each rescue and fire fighting vehicle and applied to the overall rescue and fire fighting requirement at the aerodrome.~~

SECRETARIAT'S COMMENTS

Comments from **Cyprus, Ireland and Italy** are noted. The amendment proposed to 9.2.16 sought to make the provision a performance-based one rather than prescriptive. Further, with the introduction of the new level C foam, the existing texts in 9.2.16 would need to be further expanded, thus making the provision rather prescriptive if maintained in the existing form. To support the proposed objective-based amendment, the existing guidance material in Chapter 2, Doc 9137 Part 1, will be further expanded to explain the intent and providing the necessary computations.

The comment from **France** is noted. The Secretariat agrees to some of the texts proposed by **France** as they add to the clarity of the provision.

ACTION PROPOSED

Amend 9.2.16 to read as follows:

9.2.16 Recommendation.— *When a combination of different performance level foams are provided at an aerodrome, the total amount of water to be provided for foam production should be calculated for each foam type and the distribution of these quantities should be documented for each vehicle and applied to the overall rescue and fire fighting requirement.*

REFERENCE: Page A-50, Table 9-2, Minimum usable amounts of extinguishing agents

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Iceland

The ICAA suggest that table 9.2 be amended so that the minimum quantity of water be based on the largest aircraft in each category.

SECRETARIAT'S COMMENTS

The comment from **Iceland** is noted. See Secretariat's response on pages B-126 and B-128.

ACTION PROPOSED

No change.

REFERENCE: Page A-51, paragraphs 9.2.21, 9.2.21A - D

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

With regard to paragraphs 9.2.21 and 9.2.21A, they introduce a change in the calculation of the reserve supplies to be provided, as the existing paragraph 9.2.21 provided for 200 per cent reserve agent based on the total capacity of rescue and fire fighting vehicles, and consequently aerodrome operators that provided more vehicles than those required according to paragraph 9.2.37 were penalized. This recommendation provides for a 200 per cent reserve agent according to Table 9-2. Moreover, the changes introduced with paragraphs 9.2.21B and 9.2.21C identify the quantities of reserve supplies of complementary agent required: a) to bring the aerodrome back to an operational status following a full discharge and b) in cases where the complementary agent is the only available agent for fire fighting purposes for category 1 and 2 aerodromes. In addition, paragraph 9.2.21D addresses the case of anticipated major delays to the delivery of the reserve supplies, and therefore a risk assessment is required in order to identify if an increase to the reserve supplies is required.

SECRETARIAT'S COMMENTS

Comments from **Cyprus, Ireland and Italy** support the proposed amendments and are noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-51, paragraph 9.2.23

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

IATA

Under response time it is recommended that greater emphasis is put upon speed and appropriateness of the initial response; therefore to add a third recommendation, along those lines would strengthen the message of the document.

SECRETARIAT'S COMMENTS

The comment from **IATA** is noted. However, 9.2.23 as discussed in their comment was not part of the original amendment proposal in the State letter and, therefore, should not be considered at this stage.

ACTION PROPOSED

No change.

REFERENCE: paragraphs 9.2.38 and 9.2.39

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Uruguay

(Note.— See appropriate partial language version of this AN-WP for original text.)

9.2.38 All rescue and fire fighting personnel shall be duly trained to carry out their obligations efficiently and shall take part in real fire fighting exercises that correspond to the types of aircraft and the type of rescue and fire fighting equipment used at the aerodrome, including fires caused by pressurized fuel.

9.2.39 The training program for the rescue and fire fighting personnel shall cover instruction related to human intervention, including the coordination of teams.

SECRETARIAT'S COMMENTS

Comments from **Uruguay** are noted. However, paragraphs 9.2.38 and 9.2.39 as discussed in their comments were not part of the original amendment proposal as in the State letter and, therefore, should not be considered at this stage.

ACTION PROPOSED

No change.

REFERENCE: Page A-52, paragraph 9.2.40

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

United States

Add:

Note:-- The aerodrome operator is responsible for determining the number of personnel required to staff their RDD department

Also, modify the Airport Services Manual (Doc 9137), Part 1, by stating that the aerodrome operator has the authority to decide the staffing requirements of the RFF department.

The US is generally supportive of a task analyses to establish/verify RFF staffing requirements. However, the FAA has completed two research studies through the Airport Cooperative Research Program (ACRP) that have determined that an increase in the staff levels/manning and number of ARFF vehicles does not correlate to an increase the survival rate of aircraft occupants in the event of an aircraft incident.

US aerodrome operators are allowed to determine the number of personnel required to staff their RFF department, and there have not been any reported cases of aerodromes being unable to properly respond to aircraft accidents due to insufficient numbers of personnel.

Uruguay

(Note.— See appropriate partial language version of this AN-WP for original text.)

9.2.40 Recommendation.— During flight operations there must be sufficient competent trained personnel designated so that they can be mobilized immediately with the rescue and fire fighting vehicles, and handle the equipment at its maximum capacity. This personnel must be trained and equipped so that they can intervene within a minimum response time and ensure the continuous application of the extinguishing agents at an appropriate rate. The possibility of whether the personnel should use manual hoses and ladders and any other rescue or fire fighting equipment normally associated with rescue and fire fighting operations should also be examined.

The recommendation should be changed to a standard and should clearly include the fact that the rescue and fire fighting personnel on duty must be duly qualified and have received the team training used by the air operators at the aerodrome and the Rescue and Fire Safety Services (RFSS) team training available at the aerodrome, as well as incorporating a new paragraph on training.

9.2.40. — During flight operations there should be sufficient competent, duly qualified and trained personnel in the rescue and fire fighting team available at the aerodrome so that they can be mobilized immediately with the rescue and fire fighting vehicles, and can handle the equipment at its maximum capacity. This personnel must be trained and equipped so that they can intervene within a minimum response time and ensure the continuous application of the extinguishing agents at an appropriate rate. The possibility of whether the personnel should use manual hoses and ladders and any other rescue or fire fighting equipment normally associated with rescue and fire fighting operations should also be examined.

ACI

The term "competent" is ill-defined in relation to this requirement. We recommend using a clearer definition of the training or capabilities that personnel ought to have.

IFALPA

IFALPA would point out that trained personnel may not be competent and that competent personnel may not be trained. Therefore, IFALPA proposes that the deleted "*trained*" is reinstated so that the sentence would read "*sufficient trained and competent personnel* ".

SECRETARIAT'S COMMENTS

The proposal to include a new Note from the **United States** is noted but not supported. The concept in the United States comments to allow aerodrome operators to determine the number of personnel required is noted; however, it's global application has yet to be researched. The provision in 9.2.40, including the proposed amendment, are performance-based and can be interpreted to suite either the regulator or the operator, depending on local circumstances. Furthermore, in some States such as Australia, the rescue

and fire fighting service is not provided by the aerodrome operator. Other comments from the United States are noted and will be referred to the RFFWG when developing future SARPs.

The comment from **Uruguay** seems to suggest upgrading the recommendation to a Standard. The implementation of the proposed recommendation will be monitored for possible upgrading to a Standard in the future.

Comments from **ACI and IFALPA** revolve around the term “competent” and issues associated with training. *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868) defines competency as “a combination of skills, knowledge and attitudes required to perform a task to the prescribed standard”. It follows that in order to be competent, the necessary training should also be provided. In this context, the Secretariat agrees with the comment from **IFALPA** to reinstate the word “trained” in the first sentence.

ACTION PROPOSED

Amend 9.2.40 to read as follows:

9.2.40 **Recommendation.**— *During flight operations, sufficient trained and competent personnel should be ~~detailed designated and to~~ be readily available to ride the rescue and fire fighting vehicles and to operate the equipment at maximum capacity. These ~~trained~~ personnel should be deployed in a way that ensures that minimum response times can be achieved and that continuous agent application at the appropriate rate(s) can be fully maintained. Consideration should also be given for personnel to use hand lines, ladders and other rescue and fire fighting equipment normally associated with aircraft rescue and fire fighting operations.*

REFERENCE: Page A-52, paragraph 9.2.41

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The term “*niveau de l’effectif*” [English equivalent: “staffing level”] is not clear.

Does it refer to the level of qualification required for recruitment, the skill level, or to the total number of persons required for the rescue and fire fighting service at a given point in time?

We assume that the intention is to indicate the number of fire fighters normally available at a given moment.

This point urgently requires clarification.

Singapore

Singapore supports the proposed amendment to paragraph 9.2.41 using a task resource analysis to determine the minimum number of RFF personnel required. Such an analysis will serve to provide clarity to both aerodrome operator and regulator on the minimum level of RFF staffing required in a particular shift.

Uruguay

(Note.— See appropriate partial language version of this AN-WP for original text.)

9.2.41 Recommendation.- A local training program should be set up and implemented at the aerodrome in order to ensure that the applicable skills for the various operating functions of the RFSS Department are maintained and validated regularly, which involves examining the equipment that the air operators have available and carrying out exercises that put the knowledge acquired and the skills and abilities developed by the aerodrome fire fighting team into practice. See Airport Services Manual (Doc 9137), Part 1.

- (b) Recommendation.— When determining the minimum number of personnel needed for rescue and fire fighting operations, the type of aircraft that use the aerodrome must be taken into account and an analysis must be carried out of the resources needed for the task and the level of staffing declared or mentioned in the Aerodrome Manual.
- (1) There are no clear guidelines in the Airport Services Manual Part 1 of Doc 9137 with respect to the minimum number of personnel needed. It is important for an amendment to be studied by experts which, depending on the Category, establishes a minimum number of personnel required since there is no clear reference to the level of staffing required when certain types of aircraft have been eliminated.

SECRETARIAT'S COMMENTS

In order to conduct a task resource analysis (TRA), a qualitative analysis is first carried out to itemize the knowledge and practical skills involved in carrying out the task or function effectively and to the correct standard of competence. Having gathered the appropriate data and agreed on the outcomes, a quantitative analysis is then undertaken to establish the justifications for, inter alia, the minimum number of competent personnel required to deliver effective rescue and fire fighting in order to deal with an aircraft incident/accident. The TRA would also enable a rescue and fire fighting service to develop a training specification and a learning programme can subsequently be designed around the roles and tasks. In this context, the assumption by **France** is correct as regards the level of staffing ie. determination of the minimum number of rescue and fire fighting personnel as specified in 9.2.41. Detailed guidance on the conduct of a TRA has already been developed and will be included in the next revision of Doc 9137 Part 1.

The comment from **Singapore** supports the proposed amendment and is noted.

The comment from **Uruguay** is unclear, however, the Secretariat reaffirms that the identification of the types of aircraft commonly in use at the airport, as suggested by Uruguay, is an indispensable component of a TRA since this has a direct bearing on the resources required in meeting the aims and objectives of a rescue and fire fighting service at an aerodrome and the required tasks that personnel are expected to carry out.

ACTION PROPOSED

No change.

REFERENCE: Page A-52, paragraphs 9.2.40 and 9.2.41

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

Paragraph 9.2.40 addresses the need to establish the competence of fire-fighters which is related to their performance in safety relevant tasks, while the amendment of paragraph 9.2.41 is enhancing safety since - unlike the existing provision - the task resource analysis takes into account not only the aircraft types using the aerodrome, but also the environment, the equipment, etc., in order to determine the minimum number of rescue and fire fighting personnel.

SECRETARIAT'S COMMENTS

Comments from **Cyprus, Ireland and Italy** support the proposed amendment and are noted.

ACTION PROPOSED

No change.

REFERENCE: paragraphs 9.6.1 and 9.6.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Uruguay

(Note.— See appropriate partial language version of this AN-WP for original text.)

9.6.1 When servicing the aircraft on the ground there will be enough fire extinguishing equipment available, at least for initial intervention in the event that the fuel catches fire, and sufficient trained personnel available for this; and there must be a procedure in place for calling on immediate attendance by the rescue and fire fighting services to deal with a significant fuel spill or a fire.

9.6.2 When refuelling takes place when the passengers are on board or when the passengers are boarding or disembarking from the aircraft, the ground equipment will be located in such a way as to allow:

- a) The use of a sufficient number of exits so that the aircraft is quickly evacuated; and
- b) The availability of an escape route from each of the exits that are to be used in the event of an emergency.

- 1) A standard should be included with the recommended practices for refueling with passengers that includes the presence of the RFSS. This should include all of the additional precautions that must be taken when the passengers remain on board or are boarding/disembarking during refueling REF: AIRPORT SERVICES MANUAL Doc 9137 P1 Annex 6 Aircraft Operations
- (2) 9.6.2 When refueling takes place with the passengers on board, or when the passengers are boarding or disembarking from the aircraft,
 - (i) a) The ground equipment will be located in such a way as to allow the use of a sufficient number of exits so that the aircraft is quickly evacuated; and
 - (ii) b) The availability of an escape route from each of the exits that are to be used in the event of an emergency.
 - (iii) c) Will allow for the rapid intervention of the RFSS if necessary
 - (iv) d) The availability of Aerodrome RFSS personnel with sufficient extinguishing equipment and appropriate communications equipment.

SECRETARIAT'S COMMENTS

Comments from **Uruguay** are noted. However, paragraphs 9.6.1 and 9.6.2 as discussed in their comments were not part of the original amendment proposal as in the State letter and, therefore, should not be considered at this stage.

ACTION PROPOSED

No change.

REFERENCE: Page A-53 paragraphs 9.9.1, 9.9.2, 9.9.4, 9.9.5, 9.9.6, Page A-54 paragraph 9.9.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium

Guidance should be given about what means "for aircraft safety". Examples could be given.

Cyprus **Ireland** **Italy**

As in the proposed amendments to paragraph 3.4.7 of Chapter 3, in the above standards and recommendations the words "aircraft safety" are introduced in the above provisions regarding the siting of equipment and installation on operational areas. This is required in order to allow the installation of arresting systems which are frangible and intended to enhance safety in the event of an aircraft overrun, making therefore the change to have a clear safety benefit. However, since the intent of the proposed change to this paragraph is *"to allow the installation of arresting systems which are frangible and intended to enhance safety in the event of an aircraft overrun"*, it may be appropriate to make this evident

in the proposed amendment, by clearly mentioning the intent. In this case, the areas of installation of such objects on the strips, seem also to be more limited in scope

Germany

Chapter 9.9 predominantly deals with “frangible equipment”. For an arresting system to be integrated into the strip, the system has to be frangible.

Germany proposes to include the arresting system into the list of frangible equipment.

SECRETARIAT’S COMMENTS

The comments from **Belgium, Cyprus Ireland** and **Italy** and **Germany** are noted. See Secretariat’s comment and action proposed under Reference: Page A-12, paragraph 3.4.7 and the Rationale Box. (see page B-41)

ACTION PROPOSED

No change.

REFERENCE: Page A-53, paragraph 9.9.3

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Australia

While not part of this amendment, sub-paragraph 9.9.3 refers to a date which has now passed (1 January 2010), and as it no longer serves any purpose, it could be removed.

Note: Perhaps the printed Rationale should be included as a note in the Annex to give some indication as to what is intended, namely arrestor systems. The phrase "or for aircraft safety" could mean just about anything, not only arrestor systems.

SECRETARIAT’S COMMENTS

The Secretariat agrees with the first comment from **Australia** regarding paragraph 9.9.3. The Secretariat further notes that this comment should apply to 9.9.7 as well. As regards the second comment, see Secretariat’s comment and action proposed under Reference: Page A-12, paragraph 3.4.7 and the Rationale Box. (see page B-41)

ACTION PROPOSED

Delete paragraphs 9.9.3 and 9.9.7 and *renumber* other relevant paragraphs accordingly.

REFERENCE: Page A-54 paragraph 10.1.1

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

The proposal, which upgrades a Recommendation to a Standard, clearly emphasises the importance of a robust maintenance regime and aligns the existing provision with other maintenance related provisions, leading to enhanced safety.

Liberia

Liberia CAA recommends that “buildings” be included among the facilities in 10.1.1.

Switzerland

As this is a general reinforcement of the requirement, ICAO should differentiate this standard and only apply it for aerodromes to be certified and keep the recommendation formula for those which do not need to be certified.

The listing "pavements, visual aids, fencing and drainage systems" should not be added as otherwise it indicates the maintenance programme will limited to those subjects or added in a Note.

Uruguay

(Note.— See appropriate partial language version of this AN-WP for original text.)

It is recommended that electrical systems be included in aerodrome maintenance, especially those that provide back-up power.

SECRETARIAT'S COMMENTS

Comments from **Cyprus, Ireland and Italy** support the proposed amendment.

The Secretariat disagrees with the first comment from **Switzerland** relating to the application to certified /non-certified aerodromes. The provision of adequate maintenance is an important component, often neglected, for operational safety and is therefore applicable to aerodromes open to public use, certified or non-certified.

Liberia and Uruguay recommend that buildings and electrical systems be included in 10.1.1, while **Switzerland** proposes the deletion of items listed as facilities. Notwithstanding the use of the word “such as” in 10.1.1, the Secretariat agrees with the second comment from **Switzerland** to delete the list of items, thus making the Standard a broad performance-based requirement. However, in order not to lose sight of the facilities that are vital for the safety of air navigation, the Secretariat proposes the reinstatement of existing *Note 2* as well as the addition of an item on electrical systems as recommended by **Liberia**.

ACTION PROPOSED

Amend 10.1.1 including the Notes to read as follows:

10.1.1 **Recommendation.**— A maintenance programme, including preventive maintenance where appropriate, ~~should~~ **shall** be established at an aerodrome to maintain facilities in a condition which does not impair the safety, regularity or efficiency of air navigation.

Note 1.— Preventive maintenance is programmed maintenance work done in order to prevent a failure or degradation of facilities.

Note 2.— “Facilities” are intended to include such items as pavements, visual aids, fencing, drainage and electrical systems and buildings.

REFERENCE: Page A-55, 10.2 Pavements, 10.2.1

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Norway (*Note 4*)

Note 4: ICAO refers to an “updated” ASM (Doc 9137) Part 2. AIBN assumes that this will be revised according to new knowledge.

United Arab Emirates (*Note 5*)

Consider to change "...pressures in ..." to "...pressure as referred to in..." to improve readability. Perhaps the wording of "high tire pressure" needs to be updated to reflect the new terms in 2.6.6.

IFALPA

As mentioned under Chapter 2.6 the tire pressure categories have been revised and IFALPA believes that the Note needs to include unlimited as well as high tire pressures.

SECRETARIAT’S COMMENTS

Norway’s comment on the existing Note 4 is noted, but the latter is not the subject of the proposed amendment in 10.2.1. Notwithstanding, *Doc 9137 Airport Services Manual Part 2* is in the process of being updated by the FTF.

On the comments from **United Arab Emirates and IFALPA**, the Secretariat agrees to modify *Note 5* in line with the proposed changes to the *Note* to 2.6.6 c). See Secretariat’s response on page B-8 and B-9 in response to comment from IFALPA.

ACTION PROPOSED

Amend Note 5 to 10.2.1 to read as follows:

Note 5. – Where the pavement is used by large aircraft or aircraft with tire pressures in the upper categories referred to in 2.6.6(c), particular attention should be given to the integrity of light fittings in the pavement and pavement joints.

REFERENCE: Page A-55, paragraph 10.2.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium

Too much freedom is left open to the States in these provisions. More guidance should be provided to the States.

Canada

Disagreement with comments: Section 10.2.3 concerns the minimum friction level for maintenance purposes specified by a State. This is normally determined based on measurements with a continuous friction measuring device using self-wetting features. However, a minimum friction level is not specified for winter conditions such as ice and compacted snow and thus the note is not applicable to the text in 10.2.3. In addition, the note refers to information on the “clearing of runways”. The note would be more appropriately located in Section 10.3 “Removal of Contaminants”.

SECRETARIAT'S COMMENTS

See Secretariat's response on page B-13 and B-14 concerning comment from **Belgium**.

The Secretariat agrees with the comment from **Canada** concerning the relevance of the first sentence in the *Note* to the overall intent of 10.2.3. The sentence can be deleted since a similar note concerning availability of guidance on assessment of snow and ice-covered paved surfaces can be found in 2.9.9.7. The comment in the last sentence is also supported.

ACTION PROPOSED

Amend the Note to 10.2.3 to read as follows:

Note.— ~~Guidance on determining and expressing the surface friction characteristics during snow or ice conditions is given in Attachment A, Section 6. The Airport Services Manual (Doc 9137), Part 2, contains further information on this subject and on improving surface friction characteristics and on clearing of runways.~~

REFERENCE: Page A-55, paragraph 10.2.3, Page A-56, paragraphs 10.2.4, 10.2.5

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Belgium (comment on 10.2.5 only)

Too much freedom is left open to the States in these provisions. More guidance should be provided to the States

Cyprus
Ireland
Italy

With regard to the maintenance of pavements, paragraph 10.2.3 does not introduce new requirements, as it is partly based on the rewording of paragraph 10.2.8. On the other hand, paragraph 10.2.4 and 10.2.5 emphasise the maintenance action to be taken before the specified minimum friction level is breached, which enhances safety, while additional guidance is provided with the notes that have been added.

SECRETARIAT'S COMMENTS

See Secretariat response on page B-13 and B-14 concerning comment from **Belgium**.

Comments from **Cyprus, Ireland and Italy** support the proposed amendments and are noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-56, paragraph 10.2.4

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

We propose:

10.2.34 ~~Measurements of the runway surface friction characteristics of a runway surface for maintenance purpose shall be made periodically~~ **periodically measured** with a continuous friction measuring device using self-wetting features and documented. The frequency of these measurements shall be sufficient to determine the trend of the surface friction characteristics of the runway.

Note 1.— Guidance on evaluating the friction characteristics of a runway is provided in Attachment A, Section 7. Additional guidance is included in the Airport Services Manual (Doc 9137), Part 2.

Note 2.— The objective of 10.2.3 to 10.2.6 is to ensure that the surface friction characteristics for the entire runway remain at or above a minimum friction level specified by the State.

Note 3.— Guidance for the determination of the required frequency is provided in Attachment A, Section 7 and in the Airport Services Manual (Doc 9137), Part 2, Appendix 5.

Switzerland *(Note 2 to paragraph 10.2.4)*

A Note referring to paragraphs 10.2.3- 10.2.6 should be added after paragraph 10.2.6.

ACI

We agree with the revised Standard in 10.2.4, stating that “The frequency of these measurements shall be sufficient to determine the trend of the surface friction characteristics of the runway”.

ACI addition to Note 2:

It is recognized that such measurements are not possible with precision at each end of a runway, due to unavoidable acceleration & deceleration distance when measuring surface friction characteristics.

IFALPA

IFALPA supports the final words in the first sentence, “... and documented.” as this requires that aerodrome users, to include, airline operators are made aware that a runway surface may not meet minimum friction levels. IFALPA would then support the continued use of the terminology of “Slippery When Wet” and this is consistent with the recommendations of the FAA Aviation Rule Committee, Take-Off and Landing Performance Assessment Requirements (TALPA ARC).

IFALPA is aware that the ICAO Friction Task Force (FTF) has recommended that the “Slippery When Wet” NOTAM to be removed. However, IFALPA believe it is important that whenever a runway is determined to fall below its minimum friction level “somebody” beyond the airport should know about it. Bearing in mind that aircraft performance is predicated on certain assumptions made by the OEM regarding the available pavement friction.

This is also consistent with the Guidance Material for Annex 14, Part 1 on page A-64 that specifies that whenever a runway is determined to fall below minimum friction levels during a maintenance test then such information is promulgated in a NOTAM.

SECRETARIAT’S COMMENTS

The Secretariat agrees with the proposal from **France** to reword the text as it better describes the intent. The proposal to reinstate the word “periodically” is seen to be consistent with the guidance in the proposed *Note 3*.

The comment from **Switzerland** is noted but not understood.

See Secretariat response on page B-40 (Singapore) concerning the comment from **ACI**.

On the comments from **IFALPA** concerning the retention of the term “slippery when wet” and its relation to aircraft operations, the Secretariat has been made aware that the method for determining minimum friction level as described in *Airport Services Manual*, (Doc 9137), Part 2, Appendix 1, has not been correlated with aircraft certification and operational performance aspects and is currently under review by the FTF. See Secretariat’s response on page B-20.

With regard to the comment from **IFALPA**, the term “slippery when wet” is intended to be used and given an operational meaning in the TALPA/ARC matrix. However, at the FTF/8 meeting (30 January – 1 February 2012, Neuilly, France), it was made known that the regulatory aspect of TALPA/ARC has been put on hold due to the priorities of the United States Congress and consequently the decision is unclear. Further developments in this regard, if any, will be monitored by the FTF in the task of developing a global reporting format, where TALPA/ARC is an important source alongside other reporting formats.

ACTION PROPOSED

Amend 10.2.34 to read as follows:

10.2.34 ~~Measurements of the Runway surface friction characteristics of a runway surface for maintenance purpose shall be made periodically measured with a continuous friction measuring device using self-wetting features and documented. The frequency of these measurements shall be sufficient to determine the trend of the surface friction characteristics of the runway.~~

Note 1.— Guidance on evaluating the friction characteristics of a runway is provided in Attachment A, Section 7. Additional guidance is included in the Airport Services Manual (Doc 9137), Part 2.

Note 2.— The objective of 10.2.3 to 10.2.6 is to ensure that the surface friction characteristics for the entire runway remain at or above a minimum friction level specified by the State.

Note 3.— Guidance for the determination of the required frequency is provided in Attachment A, Section 7 and in the Airport Services Manual (Doc 9137), Part 2, Appendix 5.

REFERENCE: Page A-57, paragraph 10.3.1, and Page A-58, paragraph 10.3.4

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

The above paragraphs, on the one hand, require contaminants to be removed from runways in an expeditious manner leading to an obvious safety benefit, while on the other hand, give the aerodrome operator flexibility to remove a prescribed list of priorities, thereby allowing reaction to local conditions; a safety benefit may arise by prioritising clearance of access routes used by emergency vehicles.

SECRETARIAT'S COMMENTS

Comments from **Cyprus, Ireland and Italy** on 10.3.1 and 10.3.4 support the proposed amendments and are noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-57, paragraph 10.3.1

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The removal of contaminants is not restricted to paved runways. However, it is useless to remove contaminants from a runway that is not operational. This was apparent, by the way, in 10.3.2 to 10.3.4. We propose:

~~10.2.8 10.3.1 The surface of a paved runway shall be maintained in a condition so as to provide good friction characteristics and low rolling resistance.~~ Snow, slush, ice, standing water, mud, dust, sand, oil, rubber deposits and other contaminants shall be removed from the surface of an operational paved runway as rapidly and completely as possible to minimize accumulation.

Note.— Guidance on determining and expressing the friction characteristics when conditions of snow or ice cannot be avoided is given in Attachment A, Section 6. The Airport Services Manual (Doc 9137), Part 2, contains further information on this subject, on improving friction characteristics and on clearing of runways. The above requirement does not imply that winter operations on compacted snow and ice are prohibited. Guidance on snow removal and ice control is given in the Aerodrome Design Manual (Doc 9157), Part 2, Chapter 7.

Norway

10.3.1 Note:

“The above requirement does not imply that winter operations on compacted snow and ice are prohibited. Guidance on snow removal and ice control is given in the Aerodrome Design Manual (Doc 9157), Part 2, Chapter 7.”

This should perhaps be deleted or rewritten. AIBN has pointed to the fact that “winter operations” on contaminated runways should exceptionally be carried out. This has also been ICAO and EASA policy.

ACI

We suggest to clarify if this applies to all runways regardless of operational status, or if it is intended to be applicable only for the active runways. In the event of an incident or accident this could be subject to scrutiny. We propose to add to the wording as follows:

~~10.3.1 The surface of a paved runway shall be maintained in a condition so as to provide good friction characteristics and low rolling resistance.~~ Snow, slush, ice, standing water, mud, dust, sand, oil, rubber deposits and other contaminants shall be removed from the surface of an active paved runway as rapidly and completely as possible to minimize accumulation.

IATA

Although there is reference to other sources of contaminants (10.3.1) the remainder of the section focuses singularly on winter operations. The unintended inference may be that because guidance is available in other documents on winter operations therefore allowing operations to continue with partially cleared aprons, taxiways and runways; where no supporting documented data is available with other hazards (e.g. volcanic ash) there may be an assumption made that operations are therefore unacceptable and this could close airfield operations down.

SECRETARIAT'S COMMENTS

There are merits on the comments from **France and ACI**. The Secretariat agrees to modify the term “paved runway” with “operational runway” since, in the interest of safety, contaminants should also be removed from runways that are unpaved.

Norway raises the question of whether the *Note* to Standard 10.3.1 should be deleted or rewritten. At the outset, it should be kept in mind that a *Note* to a Standard gives factual information or references bearing on the Standard in question, but not constituting part of the Standard. The objective of 10.3.1 is to ensure that all contaminants shall be removed from the surface of a runway as rapidly and completely as possible to minimize accumulation and thereby establish an acceptable level of safety. The *Note* then clarifies that this does not imply that operations on compacted snow or ice are prohibited. There are many parts of the world where operations are carried out over a lengthy period on runways covered by compacted snow and ice. The Secretariat refers to the May 2011 report from the Accident Investigation Board, Norway (AIBN) pointing to the need for, amongst others, an overall risk assessment of winter operations as part of the State Safety Programme. It also recommends that the national civil aviation authority “considers introducing national limitations on winter operations in order to ensure an equivalent level of safety” Very clearly, the responsibility therefore rests on the State to permit such an operation based on its safety program. However, it cannot be overemphasized that the goal of 10.3.1 is the removal from the movement area of all contaminants and debris that adversely affect aeroplane performance.

As far as the comment from **IATA** is concerned, the FTF is looking into the impact of other contaminants such as volcanic ash on runway safety and airfield closure where coordination is currently being carried out with the International Volcanic Ash Task Force (IVATF).

The Secretariat wishes to point out an editorial correction in the *Note* pertaining to manuals.

ACTION PROPOSED

Amend 10.3.1 to read as follows:

~~10.2.8~~ **10.3.1** ~~The surface of a paved runway shall be maintained in a condition so as to provide good friction characteristics and low rolling resistance. Snow, slush, ice, standing water, mud, dust, sand, oil, rubber deposits and other contaminants shall be removed from the surface of an operational runway as rapidly and completely as possible to minimize accumulation.~~

Note. — ~~Guidance on determining and expressing the friction characteristics when conditions of snow or ice cannot be avoided is given in Attachment A, Section 6. The Airport Services Manual (Doc 9137), Part 2, contains further information on this subject, on improving friction characteristics and on clearing of runways. The above requirement does not imply that winter operations on compacted snow and ice are prohibited. Guidance on snow removal and ice control, and removal of other contaminants is given in the Aerodrome Services Manual (Doc 9137), Parts 2 and 9.~~

REFERENCE: Page A-58, paragraph 10.3.4

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Germany**Disagreement with comments**

Germany proposes to specify or delete the term “interested parties”, because it is unclear which parties can be interested.

Germany proposes the following wording:

10.3.4 Recommendation.— Whenever the clearance of snow, slush, ice, etc., ... consultation with the aerodrome users ~~and other interested parties~~ but should ultimately be decided by the aerodrome operator...

ACI

Acknowledging that this is only a recommendation, we object to the wording “and other interested parties” – this is too broad. We suggest that the entire paragraph can be deleted without any consequence.

~~10.3.4 Recommendation.— Whenever the clearance of snow, slush, ice, etc., from the various parts of the movement area cannot be carried out simultaneously, the order of priority after the runway(s) in use should be set in as follows but may be altered following, as necessary, consultation with the aerodrome users and other interested parties:~~

SECRETARIAT'S COMMENTS

On the comments from **Germany and ACI** concerning the use of the term “interested parties”, the term was used to reflect changes in provision of services such as air traffic services that have evolved in various regions. In a working paper to the *AN Conf/5-WP/63, CAeM-IV/Doc 10 dated 28/8/67 Agenda Item 5, Paper No. 9*:

“Note 1: When preparing their plans, the aerodrome authority must also consult the aerodrome users (and Air Traffic Services where these are not part of the authority) paying particular attention to arranging for reasonably ready access to the runways by the snow clearing and precipitant measuring teams.”

Additionally, in some countries such as **Australia**, such services as rescue and fire fighting, as mentioned in the *Rationale*, may not necessarily be provided by the aerodrome operator and neither are they considered airport users.

In light of the above, the Secretariat proposes the inclusion of a new Note to better describe the term “interested parties”.

ACTION PROPOSED

Add new Note to 10.3.4 to read as follows:

Note.— Interested parties may include such services as air traffic service and rescue and fire fighting.

REFERENCE: Page A-59, paragraph 10.4.5

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

Proposed changes would enhance safety by introducing specifications related to pavement overlays vis-à-vis their friction.

Proposed change provide useful information related to the use of LED technology and the promulgation of relevant safety-related information.

SECRETARIAT'S COMMENTS

Comments from **Cyprus, Ireland and Italy** support the proposed amended and are noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-59, new Sections 10.4.5 and 10.5

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Uruguay

(Note.— See appropriate partial language version of this AN-WP for original text.)

Uruguay proposed the inclusion of new section 10.4.5 and 10.5 on the technical maintenance.

10.4 5 Visual aids

Note 3. — Enhanced vision systems (EVS) technology relies on the infra-red heat generation capacity of the incandescent lighting. The Annex 15 protocols provide the appropriate means of notifying the EVS users at the aerodromes when the lighting systems are converted to LED.

It should be recommended that before lighting systems are converted to LED, the definitions section should include a definition of this technology.

3) It is recommended that the Aerodrome Design Manual DOC 9157 Part 4 Visual Aids should contain information about alternative lighting sources, such as light emitting diodes (LED), what requirements they have to meet and should establish the equipment specifications in each case so that the lighting systems can be converted to LED. In addition, to help the States, it should be established that the

new equipment and the design and operation provisions must be checked so that they are acceptable for the change of lighting technology.

4) The intensity of a device with an alternative lighting source designed to operate in 3 or 5 direct current regulator stages should vary according to the characteristics of an incandescent lamp and should be described in the Aerodrome Design Manual DOC 9157 Part 4 Visual Aids so that it can be taken into consideration in the design and Installation and form part of the airport's visual aids, considering that the light output from the lamp should increase with the stages when the current is increased and should decrease with the stages when the current is reduced.

MIXING LIGHT SOURCE TECHNOLOGIES.

The increasing use of light emitting diodes (LED) must be studied, especially in the operations area to determine whether it is possible to use a mixture of incandescent lamps and LED lamps in view of the chromaticity (aviation white) that can present a perceived difference in color and/ or brightness with regard to an equivalent incandescent lamp. These differences can potentially distort a pilot's view. The Aerodrome Design Manual must therefore contain clear specifications about this.

10.5 Electrical systems maintenance

It is proposed and recommended that the technical characteristics of the primary and back-up power sources be defined so that the electronic equipment operates satisfactorily and to identify which systems are accepted. The following texts are presented by way of an example.

- (ii) 10.5.1 Maintenance operations will include maintenance planning, preventive maintenance inspection, visual inspection, repairs, installation, calibration, and unscheduled maintenance procedures.
- (iii) 10.5.2 Maintenance procedures and the required documentation may differ between airports. The purpose of this document is to provide the minimum maintenance procedures required for the safe and efficient movement of the aircraft during take-off, landing, and taxiing operations.
- (iv) 10.5.3 To ensure the continuity of the aerodrome's visual aid and electronic aid guide, regardless of the actual maintenance schedules agreed, the following elements are essential for any controlled maintenance program.
 - (A) Maintenance procedures
 - (B) A document describing the service inspections that make up the maintenance program.
 - (C) A results log for each maintenance activity, scheduled and unscheduled.
 - (D) A document on Repairs and the resolution of problems with the equipment and the results of these actions, as well as details of the symptoms related to the incorrect operation.
- (v) 10.5.4 At aerodromes the good condition and operational reliability of the aerodrome's primary and back-up electrical systems will be ensured as this is an essential requirement for the safe operation of the visual aids, air navigation facilities (VOR, DME, NDB), electronic landing aids, surveillance system RADAR, air traffic control communications equipment, meteorological equipment, and the lighting of the platforms and buildings.
- (vi) *Note: See ICAO Doc 9137 Part 9 Airport Services Manual, Airport Maintenance Methods.*

- (vii) 10.5.5 The maintenance system used for back-up power will put the generator into loaded operation upon start-up and every month. During the exercise the generator load must be at least 35% of the value indicated on its plate.
 - (A) The airport lights and visual aids must be switched on before starting the test. The generator load must be at least 35% of the generator's nominal load.
 - (B) The generator must operate at the load determined in the previous point or at maximum load until the coolant temperature is stabilized. This evaporates any humidity that may have condensed in the crankcase and prevents accumulated humidity.
 - (C) The maintenance system will test all back-up generators with a nominal load of 100% for 4 hours at least once a year to eliminate the accumulation of carbon in the cylinders and as a means of detecting any possible problems with the unit. If the aerodrome does not have the maximum load it must use a suitable test bench to perform this test.
- (viii) 10.5.6 At the aerodrome special attention will be paid to the maintenance activities to be carried out for the Uninterruptible Power Supplies in accordance with the schedule and for each facility in the daily maintenance agreement with regard to all of the inspections required by the specific unit which must be disconnected in order to carry out scheduled maintenance activities due to the critical nature of the equipment, with support from these systems.
- (ix) 10.5.7 The Aerodrome Operator must file the copies of the weekly, quarterly, and annual inspections and the reports containing the days of the inspection work. An inspection register will be kept on site indicating the date and time of the inspection, the purpose, personnel, actions carried out, and the system performance.

SECRETARIAT'S COMMENTS

The comments from **Uruguay** are noted. The Secretariat notes and appreciates the additional material proposed. The Secretariat further notes that some additional material in regard to alternate light source technologies was proposed by AP/2 for inclusion in Attachment A of Annex 14, Volume I but was removed during the ANC preliminary review and directed to guidance material. In regard to specific comments, the Secretariat notes that the aviation industry is not driving the conversion to LEDs, on the contrary, it is one of the many industries being driven to change by the advent of this new technology. Therefore, it is not for the aviation industry to define LEDs or the different aspects of the technology itself but only to address the technical issues of the integration of this otherwise existing technology into aviation industry systems. In regard to comments addressing the need to update the *Aerodrome Design Manual* (Doc 9157), Part 4 *Visual Aids* the Secretariat notes that this update is an item on the current work programme of the AP, a specific subgroup for this work has been created by the VAWG, and development of material proceeds.

ACTION PROPOSED

No change.

REFERENCE: Page A-60, Attachment A. Guidance Material Supplementary to Annex 14, Volume I, paragraph 6.0

United StatesAdd:

"water-covered" and "wet"

To ensure consistency with TALPA ARC contaminants

SECRETARIAT'S COMMENTS

The comment from the **United States** is noted but not supported for inclusion in this paragraph. Guidance material on determination of friction characteristics of wet (and water covered) paved runway is available in the paragraph 7, Attachment A, Annex 14, Vol.I.

ACTION PROPOSED

No change.

REFERENCE: Page A-61, Attachment A. Guidance Material Supplementary to Annex 14, Volume I, paragraph 6.3

United StatesAdd:

...estimated surface categorized as good, medium to good, medium, medium to poor, and poor, **and nil**, and promulgated in...

The term "nil" is used by U.S. aerodromes and the FAA for describing a condition that represents almost zero. In this case, the term "nil" would appropriately characterize a condition that is worse than poor, and alert pilots to the presence of an extreme condition.

SECRETARIAT'S COMMENTS

The comment from **United States** is noted but not supported. The term NIL is currently not used in ICAO reporting runway surface friction. However, the Secretariat recalls that the inclusion of "Nil" as a braking action to be reported by pilots is one of the tasks of the FTF approved by ANC as part of the future work programme of the Aerodromes Panel (see DP/3 related to AN-WP/8545).

ACTION PROPOSED

No change.

REFERENCE: Page A-61, Attachment A. Guidance Material Supplementary to Annex 14, Volume I, paragraph 6.4

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Norway

New 6.4:

“is a comparative value and is intended to mean that aeroplanes should not experience directional control or braking difficulties, especially when landing. The figures in the —Measured Coefficient μ // column are given as an indication. At each aerodrome a specific table can be developed according to the measuring device used on the aerodrome and according to the standard and correlation criteria set or agreed by the State. The μ values given are specific to each friction measuring device as well as to the surface being measured and the speed employed.”

AIBN has in the report initiated standardization and simplification and therefore questions whether this text will contribute to this. AIBN has the opinion that the suggested text should be removed.

Switzerland

The new table provided on page A-61 of the amendment means also a modification of Table 4-1 of the ICAO Aerodrome Design Manual Part 2.

United States

Remove:

0.40 and above Good 5
0.39 to 0.36 Medium to good 4
0.35 to 0.30 Medium 3
0.29 to 0.26 Medium to poor 2
0.25 and below Poor 1

Add:

0.40 and above Good, Good to medium 5, 4
0.39 to 0.30 Good, Good to medium, Medium, Medium to poor 5,4,3,2
0.29 to 0.21 Medium, Medium to poor, Poor 3,2,1,0
0.20 and below Poor, Nil 1,0

The FAA has found through their TALPA ARC matrix validation effort that U.S. aerodrome operators would often rely too heavily on the defined μ values proposed in this ICAO recommendation. Also, the measured μ coefficient can and will vary greatly outside the defined parameters compared to the estimated surface friction. During the FAA's second year validation effort, the FAA changed the μ ranges to overlap several estimated surface friction and codes. The results showed improvements in using the process of runway condition assessments, estimated surface friction, and determining codes.

Modify:“...The μ values given **will be** specific to each friction measuring device as well as to the surface being measured and the speed employed.”

Since the new text suggests that each aerodrome should develop their own specific table, the verb should be future tense, and "are" should be changed to "will be."

ACI

As regards the table in this sub-section, we believe this should be clearly headed “For compacted snow and ice only” because now that the title of the section has been widened, there is a potential for error to use the table in all conditions.

SECRETARIAT’S COMMENTS

The Secretariat agrees with the comment from **Norway** that there is a need for standardization. To achieve this, there is a need to address some crucial challenges related to shortcomings identified and related to performance of friction measuring devices such as repeatability, reproducibility, time stability and, at the same time, how to deal with these shortcomings without disseminating misleading information.

There has been a long history of measuring and using friction values dating back to the 1950s where States developed their own approaches on how to deal with the problem and approved devices to be used within their State and jurisdiction. Since then, there have been numerous research projects involving many States and organizations, mainly in North America and Europe, trying to standardize and simplify. The obstacles and shortcomings have been multi-dimensional and are, to date, not resolved as documented by EASA through their Runway Friction Characteristics and Aircraft Braking (RuFAB) project. In addition, key players within the aviation community are reluctant to part from existing procedures. This is evident in the comment from IATA (page B-25), while other important players such as IFALPA (page B-28) are in favor of ensuring that misleading information is not disseminated. Clearly, there are opposing forces at play and trying to achieve a consensus is no easy task and at times impossible in this complex and difficult multi-faceted subject.

On balance, it is seen that the text proposed in 6.4 as guidance in Attachment A, Annex 14, Volume I, are the results achieved by consensus by the multi-disciplinary FTF and reflects the current status. The Secretariat is of the opinion that the proposed wording adequately describes the responsibility of the State and brings clarity and understanding to the confusion that exists within the aviation industry on this topic. Crucial and important work remains during phase 2 of the work programme of the FTF that had been approved by the ANC which includes, inter alia, the development of an acceptable global reporting format.

The comment from **Switzerland** is noted and will be taken into account during the updating of the manual.

The first comment from **United States** proposing changes to the values in the table in 6.4, arising from validation efforts associated with the TALPS/ARC project, is noted. However, the proposed changes have not undergone scrutiny by the FTF and is therefore not supported at this stage. During phase 2 of its work programme, the FTF will analyse all results from the various initiatives, including the TALPS/ARC project, for convergence and finalization. The Secretariat agrees with the second comment and the text will be modified accordingly.

Concerning the comment by **ACI**, the Secretariat notes that the origin of the guidance dates back to 1966 when the table was first established. Since then, new friction measuring devices have been developed and accepted for use on surfaces other than compacted snow and ice. The Secretariat is of the opinion that it would be appropriate to keep the table in Attachment A, and to refer to the FTF for any possible changes including the need for a heading.

ACTION PROPOSED

Amend last sentence of paragraph 6.4 to read as follows:

“...The μ values given will be specific to each friction measuring device as well as to the surface being measured and the speed employed.”

REFERENCE: Page A-62, middle of paragraph 6.6

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Canada

Transport Canada has conducted years of R&D and testing, and spent millions of dollars developing the Canadian Runway Friction Index (CRFI) for winter contaminated runways surfaces. A Canadian civil aerodromes, CRFI determinations using decelerometer devices on snow and ice have proven correlation with aeroplane braking coefficient (μ). Canada will continue to report CFRI when applicable for “estimated surface friction”, rather than use the terms “good, medium to good, medium, medium to poor, and poor”. The complete explanation of CRFI is contained in the AIM and CFS.

Agreement with comments: Suggest adding “a minimum of” as follows “... each third of the runway should have a minimum of three tests carried out on it.”

SECRETARIAT'S COMMENTS

The Secretariat agrees with the proposal from **Canada**. The texts are proposed to be modified accordingly.

ACTION PROPOSED

Amend the second last sentence of paragraph 6.6 to read as follows:

“In cases where a spot measuring friction measuring device is used as part of the ~~usable length~~ total assessment of ~~the runway. If it is decided that a single test line on one side of the runway centre line gives adequate coverage of the runway, then it follows that~~ estimated surface friction each third of the runway should have a minimum of three tests carried out on it. ~~Test results and calculated mean friction values are entered in a special form~~ where achievable.”

REFERENCE: Page A-64, paragraph 7

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Norway

Chapter 7 Determination of surface friction.

Norway has reported difference regarding this method due to uncertainty with regard to friction measurement. ICAO refers to an “updated” ASM (Doc 9137) Part 2. AIBN assumes that this will be revised according to new knowledge.

SECRETARIAT’S COMMENTS

The comment from **Norway** is noted. The guidance in Doc 9137, Part 2 is currently being updated by the FTF.

ACTION PROPOSED

No change.

REFERENCE: Page A-64, paragraph 7.3

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

United States

More information on friction test intervals should be provided.

The existing text could be clarified by providing additional information on test intervals. Several States have guidance on their recommended intervals which could be used as a reference.

SECRETARIAT’S COMMENTS

The comment from **United States** is noted. Note 3 to the proposed Standard 10.2.3 provides guidance for the determination of the required frequency which can be found in the manual Doc 9137 Part 2, Appendix 5. The practices of States containing similar guidance could be included in the next update of the manual.

ACTION PROPOSED

No change.

REFERENCE: Page A-65, Table A-1 ~~Friction levels for new and existing runway surfaces~~

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Canada

Disagreement with comments: Table A-1 should be included in Attachment A as it provides valuable guidance on acceptable friction levels for various types of continuous friction measuring devices. However, emphasis should be made that the values in the table are for maintenance purposes only, and not intended for any application related to the determination of aircraft operational braking performance.

ACI

If Table A1 (titled “Friction levels for new and existing runway surfaces”) is deleted, it will deprive States of guidance material in Annex 14. Whilst those represented in the Friction Task Force and Aerodromes Panel were generally in agreement with the deletion, ACI is concerned that smaller States in particular may still need this advice, as they may have difficulty in establishing a suitable minimum friction level. The table is also shown in the Airport Services Manual part 2 – Pavement Surface Conditions, and should be retained when that Manual is revised.

The deletion seems to be proposed because there was no agreement on a single system that all States can support, or on a method of creating an internationally accepted scale from the readings of different continuous friction measurement devices. ACI still feels that this is a worthwhile objective, and that ICAO should remain receptive to further research to this end.

SECRETARIAT’S COMMENTS

Canada and ACI disagree with the proposed deletion of Table A-1.

Recalling previous discussions on this subject, the view within the FTF was that the existing guidance gave rise to a possible confusion between functional friction measurement, i.e. the friction measurements made for construction and maintenance purposes, and operational friction measurement i.e. the eventual friction measurements performed to assess the estimated surface friction on contaminated runways for operational use. It was noted that the misuse of figures given in Table A-1 had contributed to at least two accidents in one State. The FTF was cognizant that, subsequent to the development of Table A-1, tests performed by some States had revealed that the maintenance planning level (MPL) and minimum friction level (MFL) values indicated for the various test equipments might be obsolete and the correlation between them was consequently questioned. However, consensus within the FTF on updated values cannot be achieved as each friction measuring device indicated in Table A-1 was in fact representative of a type of device, meaning that another test device of the same type could give different measurements, even if it was of a same make. The FTF envisaged removing Table A-1 from the green pages but in the end, it was considered more suitable to keep it almost unchanged but with multiple caveats related to its use. This position was adopted during the second meeting of the Aerodromes Panel.

The Secretariat recalled that the suitability of retaining Table A-1 was discussed extensively by the ANC during the initial review. A decision to delete the table was finally taken by the ANC (187-1) based on the recommendation of Champion Team 5. The table, which was essentially guidance material, continues to be available in Doc 9137 Part 2. During the next revision to the manual, the emphasis and concern expressed by Canada would be considered for incorporation into the guidance material.

The comment from ACI is noted.

ACTION PROPOSED

No change.

REFERENCE: Page A-66, Attachment A, Section 8. Drainage characteristics of the movement area and adjacent areas

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The language in this chapter is still not clear. It should be reviewed.

The language in this section places great emphasis on pavement grooving.

Whereas grooving is a corrective measure that can be used if a runway demonstrates low friction characteristics or water retention problems, it should not be considered obligatory when designing a new runway; this, however, is contrary to the implication of the text.

In fact, if adapted and standardized materials are used when constructing a pavement, grooving is not necessary. Materials with a strong macrotexture like those used in France and Europe enable good friction levels to be achieved, and they provide efficient pavement drainage. These materials are subject to European standardization.

Pavement grooving has several disadvantages:

- a grooved pavement requires more frequent and sustained maintenance;
- the grooves weaken the pavement structure;
- the grooves deteriorate as a result of traffic, which weakens the structure of aviation pavement and, most importantly, renders the grooving ineffective.

This chapter lacks examples of groove implementation (width, depth, pitch).

SECRETARIAT'S COMMENTS

Referring to the comment from **France**, it is to be noted that the status of the proposed material is guidance. The thrust of the guidance in Section 8 deals with drainage characteristics of pavement surfaces during design, construction and maintenance. Although there are limitations with grooving, as pointed out by France, it is generally accepted that grooving is one of the means to improve runway surface texture. Further information concerning width, depth and pitch on groove implementation is available in Doc 9157 Part 3, Chapter 5. The disadvantages of grooving as highlighted will be considered for inclusion in the next revision of the manual.

ACTION PROPOSED

Request the Pavement Sub Group to update guidance on pros and cons of grooving in the next revision of Doc 9157 ADM Part 3.

REFERENCE: Page A-67, 8.2 Design of pavement, paragraph 8.2.1

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

A pavement is designed to provide water drainage by building in longitudinal and transverse slopes and by means of the texture of the materials.

Drainage should not enter *a priori* into the pavement design phase. Drainage does not shorten the path of the water in terms of length, but it may allow for a faster flow rate.

The term “sub surface drainage system” should be clarified. Does this mean a drainage system corresponding to that of porous asphalt or to a buried drainage system?

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The term “sub surface drainage system” is commonly used in civil engineering and refers to a system of drainage that is installed below the pavement structure. Porous asphalt or the use of porous friction wearing course is generally not classified as sub surface drainage. Information on porous friction course is available in Doc 9157 Part 2.

ACTION PROPOSED

No change.

REFERENCE: Page A-67, 8.2, paragraph 8.2.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The addition of grooves may have the effect described at the outset, but after several passages, the grooves start to deteriorate and create water retention areas. Furthermore, the improvement is not always significant, depending on the selected pavement design (textures and slopes).

We propose:

8.2.2 Dynamic drainage is achieved through built-in texture in the pavement surface. The rolling tire builds up water pressure and squeezes the water out the escape channels provided by the texture. The dynamic drainage of the tire-to-ground contact area is **may be** improved by adding transverse grooves provided that they are subject to rigorous maintenance.

SECRETARIAT'S COMMENTS

The comment from **France** is noted. The replacement of the operative word “is” by “may be” does not significantly alter the meaning in the guidance material. The proposal to include statements concerning maintenance in 8.2 which deals with design matters, is not considered appropriate. **France**'s intent is adequately addressed in section 8.4. See Secretariat's response on page B-166.

ACTION PROPOSED

No change.

REFERENCE: Page A-67, 8.3 Construction of pavement

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**France**

(Note.— See appropriate partial language version of this AN-WP for original text.)

Drainage should not enter *a priori* into the pavement design phase. It is implemented later.

SECRETARIAT'S COMMENTS

The comment from **France** is noted, however, the term *a priori* in this context is not properly understood.

ACTION PROPOSED

No change.

REFERENCE: Page A-67, paragraph 8.3.4

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**France**

(Note.— See appropriate partial language version of this AN-WP for original text.)

The term “skid resistance” should rather be “slip resistance”. The most common term, however, is “pavement grip”. We propose:

8.3.4 Microtexture is the texture of the individual stones and is hardly detectable by the eye. Microtexture is considered a primary component in ~~skid resistance~~ **pavement grip for the aircraft moving thereon** at slow speeds. On a wet surface at higher speeds a water film may prevent direct contact between the surface asperities and the tire due to insufficient drainage from the tire-to-ground contact area.

SECRETARIAT'S COMMENTS

The comment from **France** is noted but not supported. The term “skid resistant” is used and defined in Circular 329 *Assessment, Measurement and Reporting of Runway Surface Conditions*.

ACTION PROPOSED

No change.

REFERENCE: Page A-68, paragraph 8.3.5

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

As we understand it, the “polished stone values” correspond to the values expressed in terms of the PSV (Polished Stone Value). These values make it possible to select a material with a good microtexture.

We propose:

8.3.5 Microtexture is a built-in quality of the pavement surface. By specifying crushed material that will withstand polishing microtexture, drainage of thin waterfilms are ensured for a longer period of time. Resistance against polishing is expressed through the polished stone values in terms of the PSV (Polished Stone Value), which are is in principle a value obtained from a friction measurement in accordance with international standards. These standards define the PSV minima that will enable a material with a good microtexture to be selected.

SECRETARIAT'S COMMENTS

The changes proposed by **France** add clarity to the subject and are supported by the Secretariat.

ACTION PROPOSED

Amend paragraph 8.3.5 of Section 8, Attachment A, Annex 14, Volume I to read as follows:

8.3.5 Microtexture is a built-in quality of the pavement surface. By specifying crushed material that will withstand polishing, drainage of thin water films is ensured for a longer period of time. Resistance against polishing is expressed in terms of the Polished Stone Value (PSV), which is in principle a value obtained from a friction measurement in accordance with international standards. These standards define the PSV minima that will enable a material with a good microtexture to be selected.

REFERENCE: Page A-68, paragraph 8.3.6

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

We propose a different, less controversial example.

8.3.6 A major problem with microtexture is that it can change within short time periods quickly without being easily detected. A typical example of this is the accumulation of rubber a deposits of dust or mud in the touchdown area which will largely mask microtexture without necessarily reducing macrotexture.

SECRETARIAT'S COMMENTS

The Secretariat is of the opinion that the proposed example might be more controversial. The contaminant rubber adheres to the aggregates in the pavement and provide a new surface where the microtexture is masked. The examples of contaminants quoted by **France** are loose contaminants and act more as a lubricant than providing a new surface. Rubber deposits are a more universal contaminant and should not be deleted as an example. Mud is generally not considered as a common contaminant on runways as dust – such as from sandstorms. This contaminant, however acts more like a lubricant than providing a new surface with reduced microtexture.

ACTION PROPOSED

No change.

REFERENCE: Page A-68, paragraph 8.3.7

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**France**

(Note.— See appropriate partial language version of this AN-WP for original text.)

We propose to be slightly more precise:

8.3.7 Macrotexture is the texture among the individual stones. This scale of texture may be judged approximately by the eye. Macrotexture is primarily created by the ~~size of aggregate used~~ curve and the particle size classes of the material used or by surface treatment of the pavement. Macrotexture is the major factor influencing drainage capacity at high speeds. **Materials shall be selected so as to achieve a good macrotexture.**

Moreover, the surface treatment also determines the maintenance techniques. This point should also be included in part 8.4 Maintenance.

SECRETARIAT'S COMMENTS

Curve and particle size classes are not defined, nor a reference given. The terms are yet to be discussed and used in ICAO documents. The Secretariat is not in favour of adding the proposed terms; however, the last sentence proposed by **France** adds clarity and is accepted. Concerning surface treatment and maintenance techniques, these will be referred to the FTF for developing appropriate guidance material.

ACTION PROPOSED

Amend the last two sentences of 8.3.7 to read as follows:

Macrotexture is primarily created by the size of aggregate used or by surface treatment of the pavement and is the major factor influencing drainage capacity at high speeds. Materials shall be selected so as to achieve a good macrotexture.

REFERENCE: Page A-68, paragraph 8.3.8

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The aim is more to increase the drainage rate than to shorten the path. We propose:

8.3.8 The primary purpose of grooving a runway surface is to enhance surface drainage. Natural drainage can be slowed down by surface texture, but grooving can speed up the drainage by ~~providing a shorter~~ **increasing the drainage rate path.**

Moreover, shot blasting can also enhance surface drainage. This part should be included in 8.4 Maintenance along with shot blasting.

SECRETARIAT'S COMMENTS

Grooving adds texture and shortens the drainage path by straightening the paths, thus providing a shorter distance travelled and enhancing drainage. A coarser textured surface provides a slower drainage than a smooth textured one.

The Secretariat disagrees with removing the existing texts but agrees to include the texts proposed by **France** since it adds to clarity.

ACTION PROPOSED

Amend the last sentence of 8.3.8 to read as follows:

Natural drainage can be slowed down by surface texture, but grooving can speed up the drainage by **providing a shorter drainage path and increasing the drainage rate.**

REFERENCE: Page A-68, paragraph 8.3.9

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Switzerland

These articles are too specific and should not be included in the Annex 14, but, in the appropriate Aerodrome Design Manual.

SECRETARIAT'S COMMENTS

The comment from **Switzerland** is noted. The proposed guidance in Section 8 places a lot of emphasis on the role of texture in runway surface characteristics. This, in turn, affects the drainage performance of the movement area and adjacent areas which is an essential element to minimize water depth on the pavement surface. To support the proposed amendments to the relevant SARPs, the guidance in Section 8

provides immediate and up-to-date information in the Annex. Although detailed guidance can be provided during the planned update of Doc 9157, *Aerodrome Design Manual*, Part 3 — *Pavements*, the publication is expected to take some time.

ACTION PROPOSED

No change.

REFERENCE: Page A-68, paragraph 8.3.10

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The term “normal wet aircraft performance” leaves the reader uncertain. It should be explained. We assume that it most likely refers to a wet runway.

The term “friction course” should correspond to “surface course”.

We do not understand the link to the aircraft performance classes.

Certain porous asphalts are too susceptible to material loss to be used with confidence. This should be noted.

Grooving is a maintenance technique.

It is stated that, “The harmonized certification standards of some States refer to texture giving drainage and friction qualities midway between classification D and E (1.0 mm)”. This is not the case in France, where the drainage and friction qualities are based on requirements relating to pavement grip (minimum friction levels).

Moreover, the correlation between the MTD and the type of materials to be implemented as defined by international standards serves as an aid for selecting materials.

This chapter should be reviewed.

SECRETARIAT'S COMMENTS

The Secretariat agrees with the observation by **France** concerning the reference to wet runway and agrees to modify the text in the second sentence. Porous friction course is the term used by ICAO and is defined in Annex 6. The link between texture and aircraft performance on wet runways is described in Chapter 6 of Circular 329. Other comments from **France** are noted and will be referred to the FTF.

ACTION PROPOSED

Amend second sentence of 8.3.10 to read as follows:

“Related to this scale the normal wet runway aircraft performance is based upon texture giving drainage and friction qualities midway between classification B and C (0.25 mm).”

REFERENCE: Page A-69, paragraph 8.3.12

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

The references in the standard in question and the definition of “smooth surface” should be rendered more precise.

If we refer to the English version, we can assume that the validity range is from 0 to 0.4 mm rather than from 9 to 0.4 mm [Translator’s note: the French version reads “from 9 to 0.4 mm”]. We wonder what the use of such a device is if it operates within such a limited range. In fact, 0.4 mm is the lower limit for the textures of the materials used in France.

We propose to delete the entire paragraph 8.3.12.

~~8.3.12 There is a standard describing drainage capacity by the use of an outflow meter measuring the horizontal drainage. This method has a validity range from 0 to 0.4 mm MPD and can for that reason only be used on smooth surfaces. This test method does not necessarily correlate with other methods of measuring pavement surface characteristics.~~

SECRETARIAT’S COMMENTS

The Secretariat agrees with the comments from **France** that there might be limited use of the information provided and does not necessarily add to clarity.

ACTION PROPOSED

Delete 8.3.12 and correct subsequent numbering.

REFERENCE: Page A-69, paragraph 8.3.13

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Other techniques exist.

The emphasis placed on grooving in this chapter causes us to lose sight of the main objective, which is to have sufficient slopes and a good selection of materials for the construction before we consider any grooving.

In order to avoid this problem, and since grooving is primarily a maintenance technique, it would be more suitable to handle grooving in part 8.4.

8.3.13 4.4 The ESDU scale groups runway surfaces based on [macro](#)texture from A through E, where E represents the surface with best dynamic drainage capacity. The ESDU scale thus reflects the dynamic drainage characteristics of the pavement. Grooving any of these surfaces enhances the dynamic drainage capacity. The resulting drainage capacity of the surface is thus a function of the texture (A through E) and grooving. The contribution from grooving is a function of the size of the grooves and the spacing between the grooves. Aerodromes exposed to heavy or torrential rainfall must ensure that the pavement and adjacent areas have drainage capability to withstand these rainfalls or put limitations on the use of the pavements under such extreme situations. These airports should seek first to have slopes and adapted materials and then to consider grooved pavements in the E classification to ensure that safety is not impaired.

SECRETARIAT'S COMMENTS

The comments from **France** are noted. The Secretariat does not agree with the proposed relocation of 8.3.13 as these had been agreed upon by the multi-disciplinary FTF. The Secretariat, however, agrees with the changes proposed in the last sentence.

ACTION PROPOSED

Amend last sentence of 8.3.13 to read as follows:

These airports should seek to have the maximum allowable slopes and the use of aggregates providing good drainage characteristics. They should also consider grooved pavements in the E classification to ensure that safety is not impaired.

REFERENCE: Page A-69, 8.4 Maintenance of drainage characteristics of pavement

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

This part, which relates to maintenance, should discuss grooving, and paradoxically, it is the only part that does not touch upon this topic.

Additionally, it should be mentioned that the addition of grooving gives rise to considerable maintenance costs. Indeed, if not maintained, the grooves lose their shape, thus creating additional defects susceptible to the accumulation of water, and they have no additional effect on drainage.

For grooved cement pavements, care must also be taken when repairing slab joints. These joints transversely block the grooves and create areas susceptible to the accumulation of water.

We propose to add two paragraphs:

“8.4.2 Transverse pavement grooving may be used in order to enhance pavement drainage at specific points. The condition of the grooved pavements should be regularly inspected in order to ensure that no deterioration has occurred and that the grooves are in good condition.”

“8.4.3 The pavement may be shot blasted in order to enhance the pavement macrotexture.”

SECRETARIAT’S COMMENTS

Comments from **France** are noted. The Secretariat does not agree with the first sentence of the proposed 8.4.2 concerning “specific points”. Grooved runway can be used as a “performance class” when it comes to operation of aircrafts. Annex 6, Part 1 contains a definition of “grooved runway”. Some airlines allow credit for a runway when it is grooved; some States such as Canada considers a grooved runway equal to dry in terms of aircraft performance when the runway is reported as damp/wet. If only specific points of the runway are grooved, as proposed, it can be misleading if not properly communicated. On runways, the aim should be to have uniform conditions along the full length of the runway.

ACTION PROPOSED

Add two paragraphs as follows:

8.4.2 When groovings are used, the condition of the grooves should be regularly inspected to ensure that no deterioration has occurred and that the grooves are in good condition. Guidance on maintenance of pavements is available in Doc 9137, *Airport Services Manual*, Part 2 — *Pavement Surface Conditions* and Part 9 — *Airport Maintenance Practices* and Doc 9157 Part 2.

8.4.3 The pavement may be shot blasted in order to enhance the pavement macrotexture.

REFERENCE: Page A-70, paragraphs 9.3, 9.4, 9.5, 9.6

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Switzerland

In paragraph 9.3 the use of the word “some” in the sentence seems to indicate that only the performance characteristics of some arresting systems are reliable. It can therefore be concluded that the performances of arresting systems are not fully predictable and reliable. This sentence should be adjusted to remove the word “some”.

United Arab Emirates

Change to Attachment A, Section 9 needs to be clear that the performance characteristics (9.5 specifically) needs to refer to aircraft type noting the fact that many systems have data related to military aircraft types.

ACI

9.3 Research programmes, as well as evaluation of actual aircraft overruns into arresting systems, have demonstrated that the performance of ~~some~~ arresting systems ~~are~~ can be predictable and effective in arresting aircraft overruns.

9.4 Demonstrated performance of an arresting system can be achieved by a validated design method, which can predict the performance of the system. The design and performance should be associated to ~~that~~ based on the type of aircraft anticipated to use the associated runway that imposes the greatest demand upon the arresting system. The critical design aircraft for the arresting system should be published in the State AIP and in the Aerodrome Manual.

Question: The term “demonstrated performance” is used in 9.4 above – is there any other validated design method than the FAA’s?

9.6 The design of an arresting system must, ensure that it will not endanger an aircraft undershooting the runway, as compared with a normal Runway End Safety Area, and within the practicality of establishing this, since systematic tests may not be feasible.

SECRETARIAT’S COMMENTS

The Secretariat supports the comments from **Switzerland and the United Arab Emirates**. The Secretariat also supports the modifications made by **ACI** to paragraphs 9.3 and 9.4, as they are seen as an improvement.

ACTION PROPOSED

Amend paragraphs 9.3, 9.4 and 9.5 to read as follows:

9.3 Research programmes, as well as evaluation of actual aircraft overruns into arresting systems, have demonstrated that the performance of arresting systems can be predictable and effective in arresting aircraft overruns.

9.4 Demonstrated performance of an arresting system can be achieved by a validated design method, which can predict the performance of the system. The design and performance should be based on the type of aircraft anticipated to use the associated runway that imposes the greatest demand upon the arresting system. The critical design aircraft for the arresting system should be published in the State AIP and in the Aerodrome Manual.

9.5 The design of an arresting system must consider aircraft types and multiple aircraft parameters, including but not limited to, allowable aircraft gear loads, gear configuration, tire contact pressure, aircraft center of gravity and aircraft speed. Additionally, the design must allow safe ingress and egress of fully loaded rescue and fire fighting vehicles.

REFERENCE: Page A-71, Appendix 1 - Colours for Aeronautical Ground Lights, Markings, Signs and Panels

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Australia

Agreement with comments

In **1.General**, the Introductory Note paragraph ends with the following: "*The specifications are in accord with the 1983 specifications of the International Commission on Illumination (CIE).*"

If the new specification for White (LED) is added, this statement is no longer true. Suggestion to change to: "*The specifications, except for f) White (LED only), are in accord with the 1983 specifications of the International Commission on Illumination (CIE).*"

Similarly, the third paragraph may also need to exclude f) White (LED only), if it was not derived using the CIE protocol of "the standard observer".

SECRETARIAT'S COMMENTS

The comments from **Australia** are noted but not supported. The Secretariat notes that "The specifications are *in accord with* the 1983 specifications" of the CIE, not *copied directly from* the 1983 specifications of the CIE. The Secretariat notes that the existing chromatic definitions provided in Appendix 1 to Annex 14, Volume I are reported by the lighting experts of the VAWG to be developed by ICAO as more conservative specifications for aviation purposes than the generic colour definitions of CIE. As the identified boundaries are within the CIE boundaries of the generic definition of colours, these definitions are *in accord with* CIE specifications for those colours. As new ICAO definitions for LEDs are even more conservative than the existing incandescent ICAO specifications (which are already more conservative than the CIE generic specifications) they continue to be *in accord with* CIE specifications. The Secretariat further notes that the chromaticities continue to be expressed in terms of the standard observer and coordinate system adopted by CIE in 1931, as opposed to the standard observer definition of 1964.

ACTION PROPOSED

No change.

REFERENCE: Page A-72, Appendix 1, 2. Colours for aeronautical ground lights, 2.1.1 (f)

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

United Arab Emirates

We are seeking clarification that white (LED) are specifically permitted on the runway.

SECRETARIAT'S COMMENTS

The comment from the **United Arab Emirates** is noted. The Secretariat notes that specific permission to use specific technologies is not an inherent function of Annex 14. On the contrary, the identification of specific technologies is avoided whenever possible and provisions are written as generic as possible to promote development of technology in support of meeting the specifications of Annex 14. LED technology is currently being adopted throughout society as a whole driven by industries and environment concerns beyond the aviation industry alone. The goal of Annex 14 is to provide specifications for the safe integration of this technology in the aerodrome environment. To this end it is recognized that the source propagation technology of LED lamps, being significantly different than the source propagation technology of incandescent lamps, results in specific human factors issues of colour perception and it was recognized that more conservative boundaries needed to be defined, but balanced against issues that would be caused by being too conservative. The need to define colours specifically for LEDs other than white is currently being studied by the relevant working group of the AP, but the Secretariat does not support the need to provide specific permission for the use of LEDs (of any colour) on the runway beyond the provision of the chromaticities they must meet for reasons of safety.

ACTION PROPOSED

No change.

REFERENCE: Page A-73, Appendix 2 - Aeronautical Ground Light Characteristics

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Australia**

Disagreement with comments

The amendments to 5.3.19.6 do NOT introduce a new visual aid called "no-entry bar". It only describes a particular application of a "Stop bar". It is included within section "5.3.19 Stop bars".

There is no separate section called "No-entry bars". In fact paragraph 5.3.19.6 calls it a stop bar; quote "**Recommendation-** A stop bar should be provided,.... etc". The introduction of the visual aids system name "no-entry bar" to all these Figure headings is not appropriate.

SECRETARIAT'S COMMENTS

The comment from **Australia** is noted but not supported. The Secretariat notes that the re-instatement of a new section on No-entry bars has been proposed above. Should this proposal be accepted, this comment becomes a moot point. However, even if the above proposal to re-instate the section on No-entry bars is not approved, further reading of proposed paragraph 5.3.19.6 states that "A stop bar should be **provided**, where it is deemed necessary, **as a no-entry bar across a taxiway...**" While the Secretariat agrees that the inclusion of "no-entry bar" in the figures of Appendix 2 should not be strictly necessary (because, as pointed out in the comment, the currently proposed introduction of the no-entry bar concept does not actually establish a separate system designated "no-entry bar") it is still considered as providing clarity and reducing confusion and questions as to whether or not a stop bar used as a no-entry bar is required to

have the same characteristics as a stop bar used as a stop bar, even though there is nothing in the provision to indicate otherwise.

ACTION PROPOSED

No change.

REFERENCE: Page B-2, Appendix 1 - Contents of AIP

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Russian Federation

(Note.— See appropriate partial language version of this AN-WP for original text.)

The original version of paragraph AD 1.1, Part 3 in Appendix 1, Annex 15 and Appendix 2 in Annex 15 be retained.

Sweden

Disagreement with comments

The European situation in regard of existing and coming regulations affecting aerodromes and air traffic management make it necessary to keep a correlation between Annex 14 and Annex 15 provisions to enable adequate reporting.

SECRETARIAT'S COMMENTS

Russian Federation disagrees with the proposed amendment but no justification has been provided. Comment from **Sweden** is noted.

ACTION PROPOSED

No change.

REFERENCE: Page B-4, Appendix 2, SNOWTAM Format, Item F

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Austria

We would prefer to replace for Nr. 1 CHEMICALS instead of DAMP and to leave the other numbers unchanged. This would avoid some confusion from the user side.

Cyprus

Ireland

Italy

The proposed change to Annex 15 concerning the content of the AIP vis-à-vis the runway friction characteristics and the content of the SNOWTAM is consistent with the relevant changes to Annex 14, and therefore aim at enhancing safety.

Finland

“Damp” has been removed from the list of deposit types in the SNOWTAM format and, consequently, the code numbers for the other types of deposits have changed. This is a significant change, which is likely to confuse runway inspectors and aircrews.

Germany

Changing deposit indicators that have existed for several decades is regarded as having a safety impact on operations. As an example, “4”, which currently indicates DRY SNOW, indicating a lower fairly good braking action – is by the proposed new meaning WET SNOW, indicating a lower braking action, which might cause dangerous situations during taxiing, take-off and landing.

It is suggested that with the removal of deposit type “DAMP”, the value “1” should be used for the new deposit type “CHEMICALS” and that the current numbering is continuously kept for the unchanged deposit types. For additional new deposit types in future, a different coding like alphabetic characters could be used.

Proposal by Germany with regard to the SNOWTAM format for Item F:

NIL – CLEAR AND DRY

- 1 – ~~DAMP~~ CHEMICALS
- 2 – WET or water patches
- 3 – RIME OR FROST COVERED (depth normally less than 1 mm)
- 4 – DRY SNOW
- 5 – WET SNOW
- 6 – SLUSH
- 7 – ICE
- 8 – COMPACTED OR ROLLED SNOW
- 9 – FROZEN RUTS OR RIDGES

Italy

The change of the code numbers in the SNOWTAM format as a result of the removal of the term “damp” from Annex 14 and Annex 6 is considered necessary. It is unlikely to create confusion among aeronautical personnel and users.

Norway

The new version does not take into account the parameters temperature, dewpoint, spread and RWY temperature. AIBN considers these parameters to be important safety indicators” that should be included and taken into account.

Item F:

We do not agree in the suggested change to the series of numbers, if “damp” is removed. *Rationale:* If the suggested change is implemented the figure 4 which today equals “dry snow”, will equal “wet snow”. The figure 6 which today equals “slush”, will equal “ice”. We worry that pilots may misinterpret the new the series of numbers and that this might lead to hazardous situations. In particular pilots who do not operate on contaminated runways on a regular basis, and thus do not regularly read SNOWTAMs. We fear it may take a while before such a change is sufficiently incorporated by all pilots

operating on contaminated runways. If “damp” is removed, the figure 1 should be removed from the table. There will then be no need to change the series of numbers.

We do not see the need to introduce CHEMICALS in item F.

Rationale: This will give the information that chemicals has been used, but will not give any information on the effect of this. E.g. use of chemicals will normally result in a wet runway, and wet is then reported. If the desired effect is not achieved, there may well be some ice left on the runway. The report will say “wet” (2) in combination with ”ice” (7). Information with regard to the use of chemicals is already given in item T today.

We therefore suggest that item F remains unchanged.

Russian Federation

(Note.— See appropriate partial language version of this AN-WP for original text.)

The original version of paragraph AD 1.1, Part 3 in Appendix 1, Annex 15 and Appendix 2 in Annex 15 be retained.

Sweden

Disagreement with comments

Appendix 2 SNOWTAM FORMAT, Deposits:

Retain DAMP in accordance with our proposal above (Annex 14 para 2.9.4)

Using codes in messages of different kinds, such as SNOWTAMs, will require people to memorize the meaning of the codes. If the codes are changed, people will most likely, from time to time, forget that the codes have changed. In this case many categories are involved, like airport personnel, pilots and other airline personnel, ATS personnel, AIS personnel, and MET personnel. There is a critical difference in characteristics between how to handle an aircraft on a wet runway (code 2 today) and a runway with rime or frost (code 2 in the proposal) or a runway with ice (code 7 today) and a runway with compacted or rolled snow (code 7 in the proposal). Consequently, we propose to minimize the changes. Sweden suggests that CHEMICAL is reported using the figure 0 since it is desirable to keep the codes to a single digit.

Switzerland

The terms should be harmonised with paragraph 2.9.2, Note 2 to 2.9.2 and 2.9.9.

United States

“Deposits Block” (F)

Remove: "RIME OR" in front of "FROST"

Remove: "COVERED" after "FROST"

Remove: "FROZEN RUTS OR RIDGES" and allow for reporting in Block "T" - Plain Language Remarks

Remove: "OR ROLLED" from "COMPACTED OR ROLLED SNOW"

Add: "WATER", "WATER OVER COMPACTED SNOW", "DRY SNOW OVER COMPACTED SNOW", "WET SNOW OVER COMPACTED SNOW", "WET ICE", "WET SNOW OVER ICE", and "DRY SNOW OVER ICE"

To agree with contaminants recognized by the TALPA ARC as affecting the ability of an aircraft to stop on a runway surface.

“Mean Depth Block” (G)

Remove: "MEAN DEPTH"

Replace with: "MAXIMUM DEPTH"

To ensure consistency with TALPA ARC recommendations to report the highest depth of a contaminant.

EUROCONTROL

Item F: EUROCONTROL disagree with this proposed change.

The removal of deposit term "DAMP" and the proposed re-allocation of the code figures of the remaining deposit types implies that automated systems which process SNOWTAM data need to be updated on the envisaged time of application (proposed 14 NOV 2013 at 00:00), in order to correctly interpret the new meaning of the numbering. For example, "9" would mean "Frozen ruts and ridges" on 13 NOV 2013 23:59 and would mean "CHEMICALS" for a SNOWTAM issued one minute later.

Changing deposit indicators that have existed for several decades is regarded as having a safety impact on operations. As an example, '4', which currently indicates DRY SNOW – with fairly good braking action-, is by the proposed new meaning WET SNOW, indicating a lower braking action, which might cause dangerous situations during taxiing, take-off and landing.

It is suggested that with the removal of deposit type "DAMP", the value "1" is no longer used and that the current numbering is continuously kept for the unchanged deposit types. For new deposit types, a different coding not limited to numbers, such as "C" for CHEMICAL or a continuance of letters (NIL23456789ABCD.. etc) could be used. An automated system that does not recognize "C" would raise an error, which would be less critical than misinterpret the deposit type.

EUROCONTROL proposes the following for Item F)

NIL- CLEAR AND DRY

1 – ~~DAMP~~ NOT APPLICABLE

2 – WET ~~or water patches~~

3 – RIME OR FROST COVERED (*depth normally less than 1 mm*)

4 – DRY SNOW

5 – WET SNOW

6 – SLUSH

7 – ICE

8 – COMPACTED OR ROLLED SNOW

9 – FROZEN RUTS OR RIDGES

C – CHEMICALS

Coordination with Annex 3. The same codes figures for reporting of runway deposit in the SNOWTAM is used in ICAO provisions for meteorological information, as part of supplementary information on the state of the runway in METAR and SPECI. *Ref. ICAO Annex 3 Appendix 3 4.9 Supplementary information.* Re-allocation of the codes figures or inclusion of new deposit types in the SNOWTAM without consideration to the corresponding ICAO provisions for the meteorological reporting format is not recommended.

ICCAIA

There are a number of differences with the content of PANS ATM, § 12.3.1 ATC Phraseology and Annex 14, § 2.9 such as ICE UNDERNEATH, STANDING WATER, DRY SNOW ON ICE and WET SNOW ON ICE. A harmonization would require exceeding the current maximum number of items in the SNOWTAM FORMAT; Zone F (max 10, due to the use of only 1 digit).

"CHEMICALS" has been added and should also be found in PANS ATM, § 12.3.1 AT C Phraseology.

In case of estimated braking action reported by the pilot it should be clarified which specific Zone is to be used for the reporting.

SECRETARIAT'S COMMENTS

Comments from **Austria, Finland, Germany, Norway, Sweden, EUROCONTROL and ICCAIA** refer to, among others, potential confusion among the aviation community arising from a change in the codification of the various types of deposits that had been used for a long time. The Secretariat recalled that the initial set of codes was established in the mid to late 1960's, revised in early 1980's and is in use to this date. The concerns expressed by the States and international organization, are, therefore, valid and involve such issues as training and human factors. To overcome potential confusion and to minimize changes, the Secretariat agrees with the proposal from **Austria and Germany** to replace DAMP with CHEMICALS and to maintain existing codes for all other types of deposits.

Comments from **Cyprus, Ireland and Italy** supporting the proposed amendments are noted.

The additional comment from Norway refers to the need to take into account parameters such as temperature, dewpoint, spread and runway temperature. It is to be noted that the amendments currently proposed to the SNOWTAM format are consequential to the amendments proposed in Annex 14, Volume I arising from the work of the FTF. The parameters described by Norway are best pursued under the domain of Annex 3 and be included in the future global reporting format under development by the FTF.

The **Russian Federation** disagrees with the proposed amendment but no justification has been provided.

The comment from **United States** proposing the removal of certain deposits in item F) and changes in item G) are noted but not supported since they do not form part of the proposed amendment.

Annex 15, Appendix 2 provides instructions for the completion of the SNOWTAM format. Among others, suitable combinations of the existing codes may be used to indicate varying conditions over runway segments. If more than one deposit is present on the same portion of the runway, they should be reported in sequence from the top to the bottom. See also Secretariat's response on pages B-24 and B-32.

In relation to the comment from **EUROCONTROL** pertaining to the need for coordination with Annex 3, please see Secretariat's comment on page B-9 (United States). (The reference to the paragraph of Annex 3 has been erroneously quoted by EUROCONTROL. The correct paragraph is Annex 3, Appendix 3, paragraph 4.8.1.5 (b).)

ACTION PROPOSED

Amend the codes to Item F of SNOWTAM format to read as follows:

(DEPOSITS OVER TOTAL RUNWAY LENGTH)

(Observed on each third of the runway, starting from threshold having the lower runway designation number)

NIL	—	CLEAR AND DRY
1	—	DAMP CHEMICALS
2	—	WET or water patches
3	—	RIME OR FROST COVERED <i>(depth normally less than 1 mm)</i>
4	—	DRY SNOW
5	—	WET SNOW
6	—	SLUSH
7	—	ICE
8	—	COMPACTED OR ROLLED SNOW
9	—	FROZEN RUTS OR RIDGES

REFERENCE: Page B-4, Appendix 2. SNOWTAM Format, Item H**Canada**

Disagreement with Comments: Block H: Indicates that measured values cannot be reported in Block H; rather only estimated data (qualitative) is used. A State could report measured values in Block T, but quantitative measurements are really not ‘plain-language remarks’ and so may be inappropriate in T. The final decision must be the result of consultation with aircraft operators and Transport Canada will make this determination in coordination with its ongoing CRFI (Canadian Runway Friction Index) trials.

Norway

Item H:

We agree in the suggestion to remove the possibility to report measured friction in hundredths, and to remove the figure 9 (unreliable).

EUROCONTROL

The proposed removal of measured or calculated surface coefficient in the SNOWTAM item H) includes the removal of the value "9" UNRELAIBLE also for the estimated surface friction value. The rational for removing this report value is not specified in the proposed amendment to Annex 14 in the State Letter.

ICAO doc 8126 Specimen AIP AD 1.2 (2.5.4) Rescue and Fire Fighting services and Snow plan describes in which situations a runway friction estimate is considered unrealistic and where the value "UNRELIABLE" can be reported.

It is suggested that the referred section in ICAO Doc 8126 is amended to reflect the rational of removing the value UNRELIABLE for an estimated friction value.

The option to report the friction coefficient as well as the value UNRELIABLE is included in ICAO provisions for meteorological information, as part of supplementary information on the state of the runway in METAR and SPECI. *Ref. ICAO Annex 3 Appendix 3 4.9 Supplementary information.*

Removing the measured or calculated surface coefficient values in the SNOWTAM without consideration of the corresponding ICAO provisions for meteorological information is not recommended.

Instructions for the completion of the SNOWTAM format

The proposed change to SNOWTAM Item H) instructs that reporting related to friction measurement procedures should be made in the item T). It is suggested that the syntax for this reporting is developed and added to the instructions in Annex 15 for Item T), including the abbreviations which indicate the type of friction measuring device used.

Relation to Annex 15 Appendix 1 Contents of AIP - Snow plan

The proposed removal of reporting a measured or calculated surface coefficient relates to Annex 15 Appendix 1 Contents of Aeronautical Information Publication, section AD1.2.1 (3) Rescue and Fire Fighting services and Snow plan. The snow plan shall include a brief description of general snow plan considerations for aerodromes/heliports including measuring methods and measurements taken. It is suggested that the referred paragraph in Annex 15 is amended to reflect the consequential alternatives by removing the measured friction reporting. It is also suggested to amend the corresponding section in ICAO Doc 8126 Specimen AIP AD 1.2 (2.5.4) Rescue and Fire Fighting services and Snow plan, which includes further details of the published information on related runway surface assessment procedures.

IFALPA

While this note appears to be for use by aerodromes it is important to point out that IFALPA does not support the idea of intermediate braking action terms. IFALPA does not believe these can be determined reliably by pilots. This is supported by a letter from IFALPA ADO Committee to the TALPA ARC stating the same, when that body also recommended the inclusion of the intermediate braking action terms.

Nevertheless, guidance recommends that pilots use the most restrictive braking action term if mixed terms are given. So in this case a pilot would be using Good, Medium, or Poor anyway.

SECRETARIAT'S COMMENTS

Regarding the comment from **Canada**, it is noted that CRFI is a NOTAM-based reporting format and has developed differently from the NOTAM based SNOWTAM format in Annex 15. The **United States** has, under development, a NOTAM-based reporting format as part of the TALPA-ARC. One of the major tasks of the FTF during phase 2 is to aim for a global reporting format across State borders to improve safety for international flights such that pilots do not need to relate to a multitude of different reporting formats. **Canada and United States** are both represented in the FTF and the results of their initiatives will be of immense value in the development of a global reporting format.

The promulgation of measured friction values is not encouraged for the reasons spelled out in the Rationale. However, the last paragraph proposed on page B-5 paragraph 9 Item H in the State letter does not preclude such a possibility for States desirous of doing so.

The comment from **Norway** supports the proposed deletion and is noted.

With regard to the first comment from **EUROCONTROL** requesting the rationale for the removal of the value "9" UNRELIABLE, the existing guidance in Doc 8126, *Aeronautical Information Services Manual*, Appendix SPECIMEN AIP, AD 1.2-3, paragraph 2.5.4 states that "UNRELIABLE will be reported when more than 10% of a runway surface is covered by wet ice, wet snow and/or slush. Measuring results and estimates are considered absolutely unrealistic in such situations." It follows from

this guidance that information that are considered absolutely unrealistic will be provided, giving the information and at the same time saying that the information cannot be relied upon ie. it is unreliable. This kind of information does not lead to an increase in the understanding or a decrease in uncertainty, and consequently leads to confusion or is ultimately misleading. This is part of the rationale for removing the “9” UNRELIABLE. The other part follows from not reporting the actual measured friction coefficient, and consequently there is no need to report “9”. When assessing the estimated surface friction the ground personnel should be trained to assess according to the good-medium-poor scale. If in doubt, one should report on the safe side or ultimately close the runway for maintenance action and to restore the runway surface conditions to a state which can be estimated at the dry, wet or contaminated good-medium-poor scale. The need to update Doc 8126, arising from this change, is noted and the value will be referred to the FTF.

Concerning the second comment from EUROCONTROL on the development of syntax for Annex 15, Item T), this provision has been developed for some States that may have a State-approved system such as Canada (CRFI). The syntax for this reporting should be provided by the approving State in the national AIP.

On the third comment from EUROCONTROL, the Secretariat agrees that the relevant guidance in Doc 8126 needs to be updated by the FTF. The proposal to amend Appendix 1 of Annex 15 is not supported since section AD 1.2.2 (erroneously quoted as AD 1.2.1), item 3) does not limit itself to only friction measurements.

The position taken by **IFALPA** is noted and will be conveyed to the FTF.

ACTION PROPOSED

Request FTF to study the comments from EUROCONTROL and IFALPA.

REFERENCE: Page B-5, INSTRUCTIONS

Sweden

Disagreement with comments

Item H

This paragraph should be conditional. We suggest the following text: Where friction measurements are performed, friction measurements on each third of the runway and friction measuring device. Retain the rest of the paragraph as proposed except reinstate the last sentence including the list of friction measuring devices. Rationale: In line to keep in line with our proposals to keep measuring of friction as an option for operational use. The deletion of the list of measuring devices is considered as a step towards dis-harmonisation.

SECRETARIAT’S COMMENTS

The comment from **Sweden** is noted but not supported due to the reasons stated in the Rationale.

ACTION PROPOSED

No change.

REFERENCE: Page C-2, *Procedures for Air Navigation Services - Air Traffic Management* (PANS-ATM, Doc 4444)

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Cyprus
Ireland
Italy

The proposed change to PANS-ATM on ATC phraseologies reflects the changes proposed to Annex 14 with regard to condition of the movement areas of the aerodrome and the assessment of runway surface friction characteristics, and therefore offer a safety benefit.

Russian Federation

(Note.— See appropriate partial language version of this AN-WP for original text.)

The original version of paragraph 12.3.1 in Chapter 12, PANS-ATM (Doc 4444) be retained.

SECRETARIAT'S COMMENTS

Comments from **Cyprus, Ireland and Italy** support the proposed amendments and are noted. Comment from **Russian Federation** is noted but not supported since no justification is provided.

ACTION PROPOSED

No change.

REFERENCE: Page C-2, Chapter 12, Phraseologies, 12.3.1.10

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

United States

Add the term "nil" to:

g) RUNWAY REPORT AT (observation time) RUNWAY (number) (type of precipitant) UP TO (depth of deposit) MILLIMETRES. BRAKING ACTION ESTIMATED SURFACE FRICTION GOOD (or MEDIUM TO GOOD, or MEDIUM, or MEDIUM TO POOR, or POOR **or NIL** or UNRELIABLE) [and/or BRAKING COEFFICIENT (equipment and number)];

h) BRAKING ACTION REPORTED BY (aircraft type) AT (time) GOOD (or MEDIUM to GOOD, or MEDIUM, or MEDIUM to POOR, or POOR **or NIL**);

The term “nil” is used in by U.S. aerodromes and the FAA for describing a condition that represents almost zero.

SECRETARIAT'S COMMENTS

The comment from **United States** regarding the inclusion of the word NIL is noted. The Secretariat recalls that the inclusion of “Nil” as a braking action to be reported by pilots is one of the tasks of the FTF approved by ANC as part of the future work programme of the Aerodromes Panel (see DP/3 related to AN-WP/8545).

ACTION PROPOSED

No change.

REFERENCE: Page C-2, PANS-ATM, Doc 4444, Chapter 12, Phraseologies, 12.3.1.10 g)

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Germany**

Attachment C

Chapter 12, 12.3 ATC Phraseologies, 12.3.1.10 Aerodrome Information, Part g)

g) RUNWAY REPROT AT (*observation time*) RUNWAY (*number*)(*type of precipitant*) UP TO (*depth of deposit*) MILIMETERS. BREAKING ACTION **ESTIMATED SURFACE FRICTION** GOOD (or **MEDIUM TO GOOD**, or MEDIUM, or, MEDIUM TO POOR, or, POOR, or UNRELIABLE) [*and/or* BREAKING COEFFICIENT (*equipment and number*)];

Proposal for your information

Delete the word ESTIMATED to be used with every single transmission and instead insert ESTIMATED in a definition of surface friction.

g) RUNWAY REPROT AT (*observation time*) RUNWAY (*number*)(*type of precipitant*) UP TO (*depth of deposit*) MILIMETERS. BREAKING ACTION ~~ESTIMATED~~ **SURFACE FRICTION** GOOD (or **MEDIUM TO GOOD**, or MEDIUM, or, MEDIUM TO POOR, or, POOR, or UNRELIABLE) [*and/or* BREAKING COEFFICIENT (*equipment and number*)];

Norway

We would like you to consider if the word “SURFACE” is necessary inESTIMATED SURFACE FRICTION GOOD....

Rationale: It makes the phraseology easier to say and we cannot see that there would be any possibility for misunderstanding if you leave it out.

SECRETARIAT'S COMMENTS

Germany proposes the deletion of the word ESTIMATED while **Norway** proposes the deletion of SURFACE in the phraseology. The term "ESTIMATED SURFACE FRICTION" is used in the SNOWTAM format and is accordingly used in the phraseology.

ACTION PROPOSED

No change.

REFERENCE: Page C-2, Phraseologies, 12.3.1.10 g) and i)

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Sweden

Disagreement with comments

phrase g) retain the strike-out of the text in the square bracket but replace BRAKING COEFFICIENT with FRICTION COEFFICIENT

phrase i) reinstate DAMP.

SECRETARIAT'S COMMENTS

The proposal from **Sweden** to replace BRAKING COEFFICIENT with FRICTION COEFFICIENT is noted but not supported due to the reasons provided in the Rationale. A similar proposal to retain DAMP is not supported.

ACTION PROPOSED

No change.

REFERENCE: Page C-2, Phraseologies, 12.3.1.10 h)

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

IFALPA

IFALPA does not support that braking action reports of GOOD-to-MEDIUM and MEDIUM-to-POOR can be done reliably by pilots.

SECRETARIAT'S COMMENTS

Comment from **IFALPA** is noted. See Secretariat's response on page B-177.

ACTION PROPOSED

Request FTF to study the position taken by IFALPA.

REFERENCE: Page C-3, Chapter 12, Phraseology

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**Norway**

New i)

“RUNWAY (or TAXIWAY) (number) WET [or DAMP, WATER PATCHES, FLOODED (depth) STANDING WATER, or SNOW REMOVED (length and width as applicable), or TREATED, or COVERED WITH PATCHES OF DRY SNOW (or WET SNOW, or COMPACTED SNOW, or SLUSH, or FROZEN SLUSH, or ICE, or WET ICE, or ICE UNDERNEATH, or ICE AND SNOW, or SNOWDRIFTS, or FROZEN RUTS AND RIDGES)];”

AIBN is of the opinion that “wet compacted snow” should be included as described in the AIBN report.

SECRETARIAT'S COMMENTS

Comment from **Norway** is noted and will be referred to the FTF as part of the development of a global reporting format.

ACTION PROPOSED

Request FTF to study the inclusion of “wet compacted snow” in ATC phraseology.

REFERENCE: Page C-2, Phraseology

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS**ICCAIA**

"SANDED", found in Annex 14, § 2.9.9, should be added. SANDED is understood as sand or gravel for Ice treatment.

The use of "("and ") after COVERED WITH PATCHES OF SNOW should be checked as the current wording gives the impression that all subsequent contaminants are communicated only in terms of PATCHES.

SECRETARIAT'S COMMENTS

Comments from **ICCAIA** are noted and will be referred to the FTF for investigation.

ACTION PROPOSED

Request FTF to study the inclusion of “SANDED” and the use of “and” in ATC phraseology.

REFERENCE: Pages D-1 to D-3 Runway End Safety Areas, Guidance on Mitigating Measures

STATES’ AND INTERNATIONAL ORGANIZATIONS’ COMMENTS

Switzerland

Comment to 5 (i)

Publishing the RESA and/or arresting systems provision in the AIP does not reduce the severity of the consequences should an event occur. It may be considered as a measure aimed at reducing the likelihood of an overrun/undershoot in the sense of an increased awareness to the pilots.

Comment to 8

When introducing references to specific CAA documents, ICAO should at least insert the date of the document and ensure that the reference is and will be up to date.

United States

Remove: "A" from "150/5220-22A"

Using the base numbers will ensure that the reference will always be relevant. Otherwise, users may become confused since the ACs are updated frequently, which causes the last letter to change.

ACI

ACI supports the implementation of specific runway risk analysis, using the factors outlined in Attachment D to the State Letter.

SECRETARIAT’S COMMENTS

The comments from **Switzerland, United States and ACI** are noted. As mentioned in State letter AN 4/1.1.52-11/41, Attachment D is guidance material intended for inclusion in the *Aerodrome Design Manual*, Part 1 after the relevant proposed SARPs become applicable. It was provided only to assist States in the review of the proposed SARPs and not for comment. However, the Secretariat will take the above comments into account in finalizing the guidance material.

ACTION PROPOSED

Take the above comments into account in finalizing the guidance material on runway end safety areas for inclusion in the ADM, Part 1.

Language and Translation Issues**1. REFERENCE:** Page A-6, paragraph 2.9.4**STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS****France**

(Note.— See appropriate partial language version of this AN-WP for original text.)

The English version does not impose a restriction to aeroplane performance purposes only, but the French translation includes the word “*seulement*”. We propose to delete the word “*seulement*” from the French text.

[Translator’s note: the proposal does not affect the English text.]

2. REFERENCE: Page A-6, paragraph 2.9.6**STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS****France**

(Note.— See appropriate partial language version of this AN-WP for original text.)

[Translator’s note: In the comment below, a distinction is made between “rigid runway” and “paved runway.” The French translation uses “*piste en dur*” (“rigid runway”) where the English text says “paved runway”.]

The notion of a “*piste en dur*” (English: rigid runway) includes “*pistes revêtues*” (English: paved runways) (i.e. covered with bituminous concrete or cement concrete) but is not exclusive thereto (consider the case of runways on hard natural soil, such as laterite). 2.9.6 cannot, however, refer only to “*pistes revêtues*” (English: paved runways). We propose replacing “*piste en dur*” (English: “rigid runway”) with “*piste revêtue*” (English: “paved runway”) in the French version of 2.9.6 and the corresponding Note.

NB: The term “*piste en dur*” is used in several of the specifications of Annex 14, and thus the suitability of this term should be reviewed. As regards the specifications relating to friction characteristics, the term “*piste revêtue*” is more suitable (cf. Annex 14, notes of 2.9.6 and 2.9.7, 3.1.23, 3.1.23A, 10.2.3, 10.3.1, Sections 6 and 7 of Supplement A).

In order to avoid confusion, it would be useful to define the term “*piste revêtue*” and perhaps also the term “*piste en dur*”. We understand the term “*piste revêtue*” (English: paved runway) to mean a runway covered with cement concrete or bituminous concrete (rather than grass or other material).

3. REFERENCE: Page A-8, paragraph 2.9.9**STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS****France**

(Note.— See appropriate partial language version of this AN-WP for original text.)

[Translator's note: This comment concerns French terminology. The English term "contaminant depth" was translated into French as "*profondeur de contaminant*" but the French term normally used in this context is "*hauteur de contaminant*".]

4. REFERENCE: Page A-25, paragraph 6.1.1.2

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

[Translator's note: The proposed change in the French does not affect the English text.]

We understand the lights here to be elevated lights (like those used in 5.3.1.7) rather than lights that extend above the obstacle limitation surfaces (since this is not specified for the signs as in the other paragraphs). [Thus a change in the French wording is proposed in order to reflect this distinction. It is proposed to change "*feux en saillie*" to "*feux hors sol*".]

5. REFERENCE: Page A-48, paragraph 9.2.9

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

Chile

(Note.— See appropriate partial language version of this AN-WP for original text.)

COMMENT: In the note to 9.2.9, level B is not indicated. It should read level A, B and C. *[Translator's note: The Spanish version of this amendment proposal has a discrepancy.]*

6. REFERENCE: Page A-52, paragraph 9.2.40

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

[Translator's note: The proposal does not affect the English text. The comment states that the usage of the term "*exploitation*" in the French version is incorrect because it implies aerodrome operations, whereas the intended meaning is flight operations. The proposal would bring the French text into line with the English.]

7. REFERENCE: Page A-54, paragraph 10.1.1

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

It is also possible to have maintenance operations that do not require a preventive maintenance program. We propose:

[Translator's note: The proposal concerns an editorial revision in French and does not affect the English text.]

8. REFERENCE: Page A-55, paragraph 10.2.3

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

For the same reasons as those cited for 2.9.6, we propose:

[Translator's note: the proposal again relates to the distinction in French between “*piste revêtue*” and “*piste dur*” and does not affect the English text.]

9. REFERENCE: Page A-68, paragraph 8.3.9

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

For the purposes of the French version, “*essai à la tache de sable*” or “*essai à la tache de graisse*” would be more suitable translations of “sand and grease patch”.

[Translator's note: the proposal does not affect the English text.]

10.REFERENCE: Page B-4, Appendix 2 - SNOWTAM Format

STATES' AND INTERNATIONAL ORGANIZATIONS' COMMENTS

France

(Note.— See appropriate partial language version of this AN-WP for original text.)

Translator's note: In the French version, both the table of qualitative data and the table of values have been deleted, which is not the case in the English version. This proposal does not affect the English version.]

The table of qualitative data should be retained (except for the “unreliable” portion). It remains paramount for the estimated friction to be indicated. It is, in fact, the table of values which should be deleted, as it is clearly explained in the corresponding comments in the State letter.

FRICITION MEASUREMENTS **ESTIMATED SURFACE** FRICTION ON EACH THIRD OF
 RUNWAY AND FRICTION MEASURING DEVICE

MEASURED OR CALCULATED COEFFICIENT	or ESTIMATED SURFACE FRICTION
0.40 and above	GOOD — 5
0.39 to 0.36	MEDIUM/GOOD — 4
0.35 to 0.30	MEDIUM — 3
0.29 to 0.26	MEDIUM/POOR — 2
0.25 and below	POOR — 1
9 — unreliable	UNRELIABLE — 9

— END —