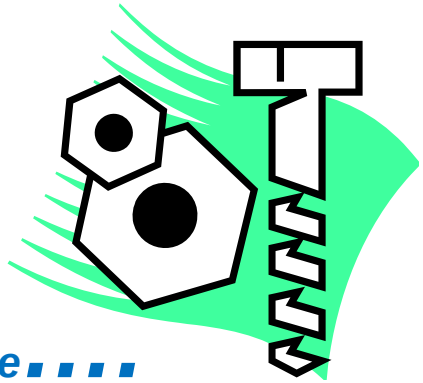
RUNWAY SAFETY – AN ANNEX 14 PERSPECTIVE

Joseph K W CHEONG, P.E.

Dubai, UAE - 2 to 4 June 2014

..THIS MORNING THE BIG

…and now



. . . the small picture . . . .

TOPICS

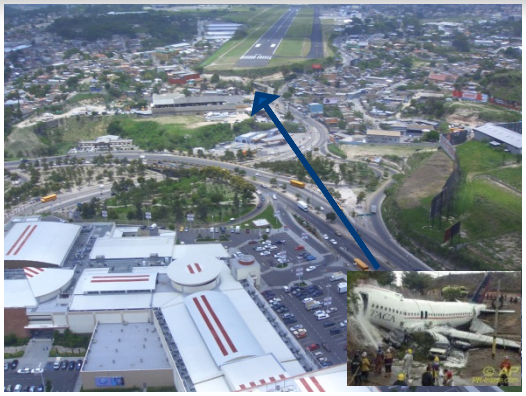
CURRENT : ANNEX 14 VOL 1 PROVISIONS RELATED TO RUNWAY SAFETY

RECENT: AMENDMENT 11 TO A14V1

IN PROGRESS: PANS-AERODROMES 1ST ED

FUTURE : AMENDMENT 12 TO A14V1
PANS-AERODROMES 2ND ED


….all flights commence
and terminate at an
aerodrome……



E-mail this to a friend Printable version

Runway reopens at Bristol Airport

The runway has reopened and flights have resumed at Bristol Airport after tests had to be carried out due to a safety row.

Ten airlines had cancelled or diverted flights after claims that aircraft had skidded on landing in wet conditions on a refurbished runway.

Safety grooves have been cut into the temporary runway surface

A total of 385 flights and 25,000 passengers have been affected since the dispute began on Friday.

December 2002
Dash 8 landing at Airport in North Carolina hit White-tailed Deer

Nobody wins when wildlife are tolerated at airports

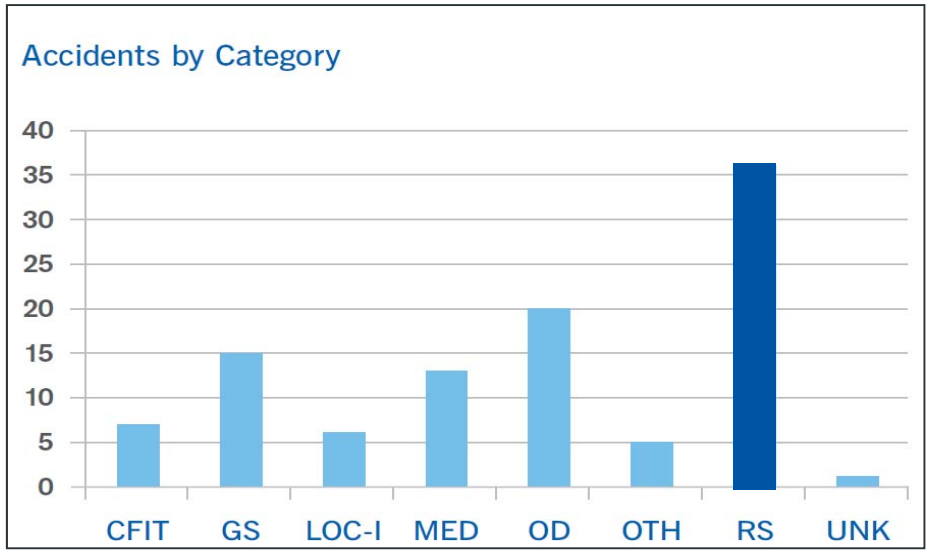
Impact collapsed nose gear

Professional programs to manage wildlife hazards at airports benefit both aviation and wildlife!

EVENT OCCURRENCES

- **ICAO Safety report 2014 :**

  “Runway safety related events include abnormal rwy contact, birdstrike, ground collision, ground handling, RE, RI, loss of control on ground, collision with obstacle(s), undershoot/overshoot, Aerodrome”



RUNWAY SAFETY ACCIDENTS REMAIN *HIGH*

"RUNWAY SAFETY IS THE *NUMERO UNO* SAFETY PROBLEM"

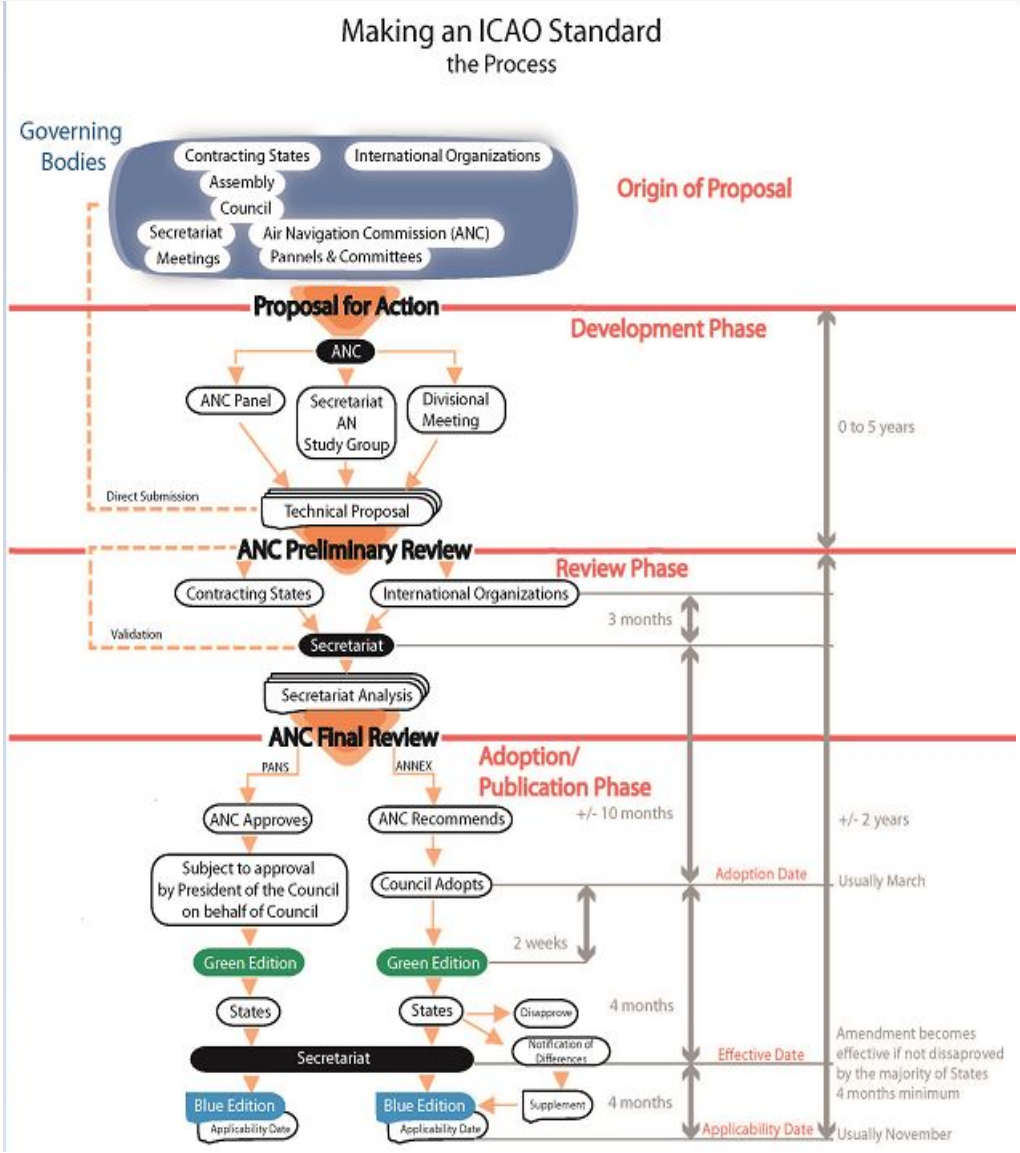
ICAO Safety Report 2014

"THE BIGGEST CHALLENGE TO AVIATION SAFETY IS NOT IN THE AIR BUT ON THE GROUND"

Paper presented by the United States of America at the 11th meeting of the Directors of Civil Aviation of Central Caribbean 2010

ANNEX 14 VOLUME I

CURRENT PROVISIONS



1200 SARPs:
- 600 Standards
- 500 RPs
- 100 Definitions

Annex 14 Vol I, Aerodrome Design & Operations (runway safety related)

§ 2	Aerodrome data
§ 2.13	Coordination between AIS & aerodrome authorities
§ 3	Physical characteristics
§ 5.2 - 5.4	Markings, Lights & Signs
§ 6	Visual aids for denoting obstacles
§ 7	Visual aids for denoting restricted use

Annex 14 Vol I, Aerodrome Design & Operations (cont'd)

§ 8	Electrical systems
§9.1 & 9.2	Emergency response & RFF
§ 9.3	Disabled aircraft recovery
§ 9.4	Wildlife strike hazard reduction
§ 9.7	Aerodrome Vehicle Operations
§ 9.9	Siting & construction of equipment & installation on operational areas
§ 10	Maintenance programs

Guidance material (runway safety related)

Doc 9137 Airport Services Manual

- Part 1 Rescue and Fire Fighting
- Part 2 Pavement Surface Conditions
- Part 3 Wildlife Control and Prevention
- Part 5 Removal of Disabled Aircraft
- Part 6 Control of Obstacles
- Part 7 Airport Emergency Planning
- Part 8 Airport Operational Services
- Part 9 – Airport Maintenance Practices

Guidance material (runway safety related)

Doc 9157 Aerodrome Design Manual

- **Part 1 Runway**
- **Part 2 Taxiways, Aprons and Holding Bays**
- **Part 3 Pavements**
- **Part 4 Visual Aids**
- **Part 5 Electrical Systems**
- **Part 6 Frangibility**

Guidance material (runway safety related)

Doc 8478 Manual on SMGCS
Doc 9774 Manual on Certification of Aerodromes
Doc 9332 Manual on the ICAO Bird Strike Information System (IBIS)
Doc 9977 Manual on Civil Jet Fuel Supply
Cir 305 Operations of NLA at Existing Aerodromes
Cir 329 Assessment, Measurement and Reporting of Runway Surface Conditions

ANNEX 14 VOLUME I

RECENT AMENDMENT

Amendment 11 to Annex 14 Vol I (only runway safety related)

§ 2.6	Increased tyre pressure category
§ 2.9 & §3	Friction characteristics (Friction Task Force Phase 1)
§ 3.5	RESA & arresting system
§ 5	Visual aids for navigation (simple TDZ lights; RGLs; No Entry bar etc)
§ 6	Visual aids denoting obstacles
§ 9	Modular concept AEP; level “C” foam; recalculation of water quantities; reserve quantities
§ 10	Maintenance, removal of contaminants (new section); friction reqmnts during overlays

PANS-AERODROMES

1st Edition

IN PROGRESS

(State Letter AN 4/1.1.53-13/81 December 2013)

PANS-Aerodromes 1st Edition

FOREWORD

- Scope and purpose
- Status
- Publication of differences
- Description of chapters

3 Chapters in PANS-Aerodromes 1st Edition:

- ***§2 Procedures for aerodrome certification***
- ***§3 Procedures for conducting safety assessment***
- ***§4 Procedures for operation of larger aeroplanes into smaller aerodromes (ie. aerodrome compatibility)***

§2 Procedures for Aerodrome certification

- **Initial certification**
- **Continued oversight**
- **Aerodrome safety coordination**
- **Management of change**
- **Certification linked to SMS maturity**

§3 Procedures for conduct of safety assessment for aerodromes

- **Basic consideration**
- **Safety assessment process**
- **Approval/acceptance of a safety assessment**
- **Promulgation of safety information**

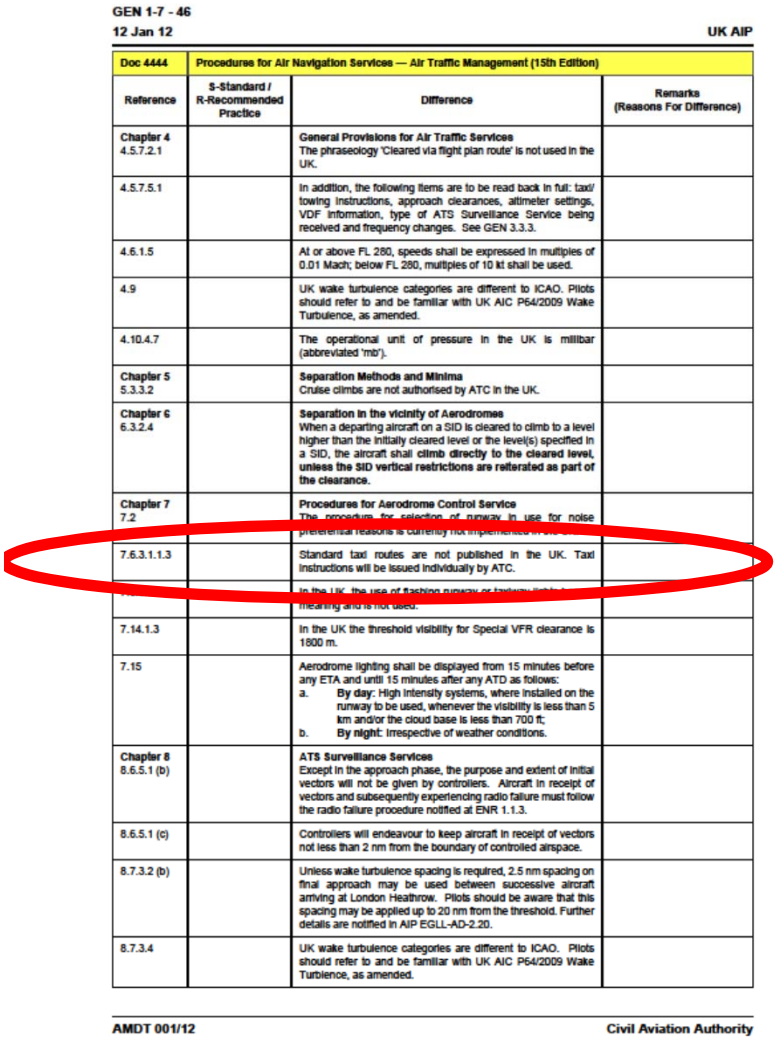
§4 Procedures for operation of larger aeroplanes into smaller aerodromes (ie. aerodrome compatibility)

- **AEROPLANE physical & operational characteristics**
- **AERODROME physical characteristics**

✓ **Introduction**

✓ **Challenges**

✓ **Potential solutions**



GEN 1-7 - 46
12 Jan 12 UK AIP

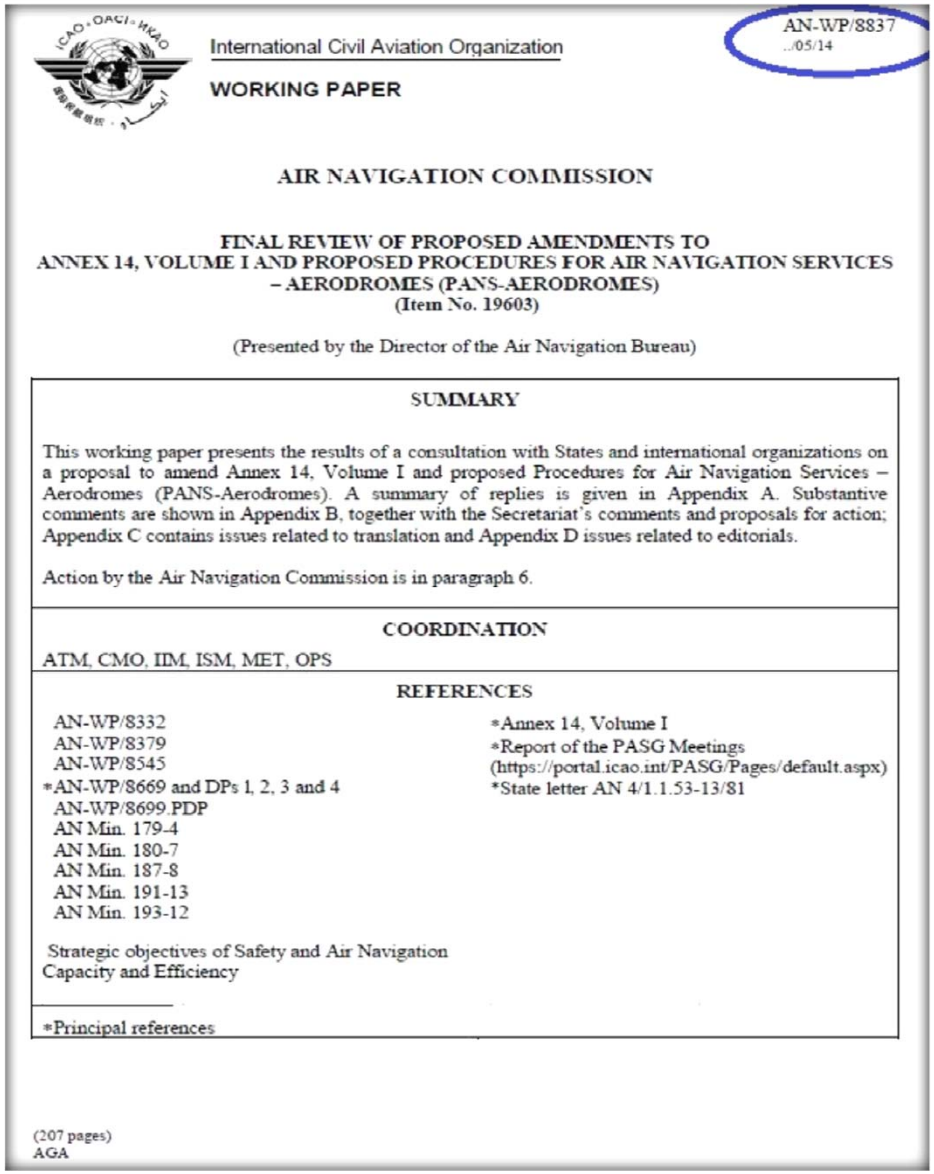
Doc 4444	Procedures for Air Navigation Services — Air Traffic Management (15th Edition)		
Reference	S-Standard / R-Recommended Practice	Difference	Remarks (Reasons For Difference)
Chapter 4 4.5.7.2.1		General Provisions for Air Traffic Services The phraseology 'Cleared via flight plan route' is not used in the UK.	
4.5.7.5.1		In addition, the following items are to be read back in full: taxi/ towing instructions, approach clearances, altimeter settings, VDF information, type of ATS Surveillance Service being received and frequency changes. See GEN 3.3.3.	
4.6.1.5		At or above FL 280, speeds shall be expressed in multiples of 0.01 Mach; below FL 280, multiples of 10 kt shall be used.	
4.9		UK wake turbulence categories are different to ICAO. Pilots should refer to and be familiar with UK AIC P64/2009 Wake Turbulence, as amended.	
4.10.4.7		The operational unit of pressure in the UK is millibar (abbreviated 'mb').	
Chapter 5 5.3.3.2		Separation Methods and Minima Cruise climbs are not authorised by ATC in the UK.	
Chapter 6 6.3.2.4		Separation in the vicinity of Aerodromes When a departing aircraft on a SID is cleared to climb to a level higher than the initially cleared level or the level(s) specified in a SID, the aircraft shall **climb directly to the cleared level, unless the SID vertical restrictions are reiterated as part of the clearance.**	
Chapter 7 7.2		Procedures for Aerodrome Control Service The procedure for selection of runway in use for noise preferential reasons is currently not implemented in the UK.	
7.6.3.1.1.3		Standard taxi routes are not published in the UK. Taxi instructions will be issued individually by ATC.	
		In the UK, the use of flashing runway or taxiway lights has a meaning and is not used.	
7.14.1.3		In the UK the threshold visibility for Special VFR clearance is 1800 m.	
7.15		Aerodrome lighting shall be displayed from 15 minutes before any ETA and until 15 minutes after any ATD as follows: a. **By day:** High intensity systems, where installed on the runway to be used, whenever the visibility is less than 5 km and/or the cloud base is less than 700 ft; b. **By night:** irrespective of weather conditions.	
Chapter 8 8.6.5.1 (b)		ATS Surveillance Services Except in the approach phase, the purpose and extent of initial vectors will not be given by controllers. Aircraft in receipt of vectors and subsequently experiencing radio failure must follow the radio failure procedure notified at ENR 1.1.3.	
8.6.5.1 (c)		Controllers will endeavour to keep aircraft in receipt of vectors not less than 2 nm from the boundary of controlled airspace.	
8.7.3.2 (b)		Unless wake turbulence spacing is required, 2.5 nm spacing on final approach may be used between successive aircraft arriving at London Heathrow. Pilots should be aware that this spacing may be applied up to 20 nm from the threshold. Further details are notified in AIP EGLL-AD-2.20.	
8.7.3.4		UK wake turbulence categories are different to ICAO. Pilots should refer to and be familiar with UK AIC P64/2009 Wake Turbulence, as amended.	

AMDT 001/12 Civil Aviation Authority

GEN 1-7 - 46
12 Jan 12 UK AIP

Doc 4444	Procedures for Air Navigation Services — Air Traffic Management (15th Edition)		
Ref	Std/RP	Difference	Remarks (Reasons for difference)
7.6.3.1.1.3		Std taxi routes are not published in the UK. Taxi instructions will be issued individually by ATC	

LISTING OF SIGNIFICANT DIFFERENCES WITH PANS PROVISIONS IN AIP PER ANNEX 15, §4, 4.1.2 c)



International Civil Aviation Organization

AN-WP/8837
../05/14

WORKING PAPER

AIR NAVIGATION COMMISSION

FINAL REVIEW OF PROPOSED AMENDMENTS TO ANNEX 14, VOLUME I AND PROPOSED PROCEDURES FOR AIR NAVIGATION SERVICES – AERODROMES (PANS-AERODROMES)
(Item No. 19603)

(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 and proposed Procedures for Air Navigation Services – Aerodromes (PANS-Aerodromes). 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; Appendix C contains issues related to translation and Appendix D issues related to editorials.

Action by the Air Navigation Commission is in paragraph 6.

COORDINATION

ATM, CMO, IIM, ISM, MET, OPS

REFERENCES

AN-WP/8332
AN-WP/8379
AN-WP/8545
*AN-WP/8669 and DPs 1, 2, 3 and 4
AN-WP/8699.PDP
AN Min. 179-4
AN Min. 180-7
AN Min. 187-8
AN Min. 191-13
AN Min. 193-12

Strategic objectives of Safety and Air Navigation Capacity and Efficiency

*Annex 14, Volume I
*Report of the PASG Meetings (https://portal.icao.int/PASG/Pages/default.aspx)
*State letter AN 4/1.1.53-13/81

*Principal references

(207 pages)
AGA

217-page ANWP-8837 Final Review of PANS-Aerodromes to be taken up by ANC on 19 June 2014

ANNEX 14 VOLUME I

WHAT'S COMING?

Third meeting of Aerodromes Panel (AP/3) (Montreal, 7 -11 April 2014))

55 members and advisors

Agenda

- aerodrome design
- visual aids
- aerodrome operations and services
- emergency response and fire fighting
- heliport design

(only runway-safety related)

Aerodrome Design

- new definition for arresting system
- publication of RESA and arresting system in AIP
- twy design guidance for prevention of RI

Visual Aids

- autonomous runway incursion warning system (ARIWS)
- location criteria for PAPI OPS
- twy naming convention

Emergency response and rescue/firefighting

- **Complete update of Doc 9137 Airport Services Manual Part 1 Rescue and Fire Fighting, 4th Edition (2014)**

Aerodrome Operations and Services

- **Definition, prevention and control of Foreign Object Debris (FOD)**
- **Improved guidance on runway unevenness**
- **Assessment and reporting of runway surface condition using an ICAO Global Reporting Format**

Runway Condition Assessment Matrix (RCAM)			
Assessment Criteria		Downgrade Assessment Criteria	
Runway Condition Code	Runway Surface Description	Aeroplane Deceleration Or Directional Control Observation	Pilot Braking Action Advisory Report
6	• DRY	---	---
5	• FROST • WET (Includes Damp and 3 mm or less depth of Water) *3 mm or less depth of:* • SLUSH • DRY SNOW • WET SNOW	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4	*-15ºC and Colder outside air temperature:* • COMPACTED SNOW	Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM
3	• WET ("may be Slippery when wet" runway) • DRY SNOW or WET SNOW (Any depth) ON TOP OF COMPACTED SNOW *Greater than 3 mm depth of:* • DRY SNOW • WET SNOW *Warmer than -15ºC outside air temperature[1]:* • COMPACTED SNOW	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	*Greater than 3 mm depth of water or slush:* • STANDING WATER • SLUSH	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1	• ICE [2]	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0	• WET ICE [2] • WATER ON TOP OF COMPACTED SNOW [2] • DRY SNOW or WET SNOW ON TOP OF ICE [2]	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

GLOBAL REPORTING FORMAT FOR REPORTING RUNWAY SURFACE CONDITION FOR ACFT OPERATIONS ON CONTAMINATED RUNWAYS :

Annex 3
Annex 6
Annex 8
Annex 11/PANS-ATM
Annex 14 Vol I/PANS-Aero
Annex 15/PANS-AIMS

Timelines

- ANC Preliminary review of AP/3 proposals during FALL session 2014
- State letter for consultation issued late 2014/ early 2015
- Final review of comments from States and int'l organizations during SPRING/FALL session 2015
- Council adopts proposed amendment to Annex 14 Volume I during WINTER session 2016 for applicability in November 2016

PANS-AERODROMES 2nd Edition

WHAT'S COMING?

PANS Aerodromes - Chapter 5

Work plan and coordination

Notes: ACI will play a lead role in the development of the subchapters and will be supported by the members identified in column I - "Drafting members"
ACI will deliver the first draft of the document to the PASG Rapporteur who will then circulate it for coordination with the entities listed in column J - "AP/ Coordination"

Chap.	Art.N°	Title / Sub-title	Source Documents	Current activity (Panel / WG / TF / etc.)	Priority	Timeline	Drafting members	AP / Coordination
5.1		**Airside Inspections**	Doc 9137 ASM Pt. 8, Chapter 3	PASG	1	Nov/2015	UKCAA / DGCA France	AOSWG / VAWG
	5.1.1	Inspection of manoeuvring area	Doc 9137 ASM Pt. 9, AOSWG papers					
	5.1.2	Inspection of aprons	ACI ASH, Chapter 3.1					
	5.1.3	Inspection of visual aids	Annex 14, Chapter 2.9					
	5.1.4	Inspection of electrical systems	Doc 9476 SMGCS Manual					
			Doc 9830 ASMGCS Manual					
5.2		**Obstacle Control and Management**	Annex 14, Chapter 4	PASG (with inputs from the IFPP/AP TF)	1	Nov/2015	Brazil DECEA	IFPP/AP TF / VAWG
	5.2.1	Criteria for Identification of obstacles	Doc 9137 ASM Pt. 6					
	5.2.2	Procedures for controlling obstacles	Doc 9137 ASM Pt. 8, Chapter 12					
	5.2.3	Coordination with stakeholders						
	5.2.4	Promulgation of obstacle information						
5.3		**Wildlife Hazard Management**	ACI ASH, Chapter 3.7	PASG	1	Nov/2015	EASA / DGAC France	AP / IBIS Advisory group
	5.3.1	Wildlife hazard assessment	Doc 9137 ASM Pt. 8, Chapter 9					
	5.3.2	Wildlife hazard mitigation measures	Annex 14, Chapter 9.4					
	5.3.3	Wildlife management procedures	Updated guidance on ASM Part 9					
	5.3.4	Wildlife hazard information collection and reporting	ASM Part 3					
	5.3.5	Coordination with stakeholders						
5.4		**FOD control**	Doc 9137 ASM Pt. 2, Chapter 10	PASG with inputs from AOSWG	2			
	5.4.2	FOD prevention programme	ACI ASH, Chapter 1.14, 2.8					
	5.4.3	FOD detection and removal	Annex 14, Chapter 10.2.1					

Chap.	Art.N°	Title / Sub-title	Source Documents	Current activity (Panel / WG / TF / etc.)	Priority	Timeline	Drafting members	AP / Coordination
5.5		**Adverse weather operations**	ACI ASH, Chapter 1.17	FTF / AOSWG (inputs from PASG)	2			
	5.5.1	Runway surface friction characteristics assessment and reporting	Annex 14, Chapter	FTF / AOSWG (inputs from PASG)				
	5.5.2	Runway surface contamination assessment and reporting	Doc 9137 ASM Pt. 2	FTF / AOSWG (inputs from PASG)				
	5.5.3	Removal of natural contaminants	Doc 9365 AWOps Manual	PASG				
	5.5.4	Pavement De-icing and anti-icing	Doc 9476 SMGCS Manual	PASG				
	5.5.5	Low visibility conditions	Doc 9830 ASMGCS Manual	PASG				
	5.5.6	Other adverse weather operations	(IATA/ALPA/ARC) / (FTF)	PASG				
5.6		**Work in progress at aerodromes**	ACI ASH, Chapter 1.16	PASG with inputs from AOSWG	1	Nov/2015	UKCAA / German CAA	AOSWG / VAWG (IFPP/AP
	5.6.1	Planning and coordination	Annex 14, Chapter 6 , 7, 9, 10					
	5.6.2	Identification of impacts on aerodrome operations	Doc 9137 ASM Pt. 8 & 9					
	5.6.3	Promulgation of information about work in progress at aerodromes						
	5.6.4	Coordination with other stakeholders						
	5.6.5	Safety procedures for work in progress at aerodromes						
5.8		**Aerodrome Emergency Preparedness and contingency planning**	Doc 9137 ASM Pt. 8, Chapter 17	AP (RFFWG)	2			
	5.8.1	Purpose and Responsibilities	Doc 9137 ASM Pt. 1 & Pt. 7					
	5.8.2	Coordination of Agencies	Annex 14, Chapter 9.1					
	5.8.3	Airport emergency plan documentation						
	5.8.4	Emergency procedures						
	5.8.5	Emergency training and competency						
	5.8.6	Emergency exercises and testing						
	5.8.7	Contingency planning						

Chap.	Art.N°	Title / Sub-title	Source Documents	Current activity (Panel / WG / TF / etc.)	Priority	Timeline	Drafting members	AP / Coordination
5.9		**Rescue and Fire Fighting**	Doc 9137 ASM Pt. 8, Chapter 17	AP (RFFWG)	2			
	5.9.1	Determination of RFF category	Doc 9137 ASM Pt. 1 & Pt. 7					
	5.9.2	Services and personnel	Annex 14, Chapter 9.1					
	5.9.3	Operational requirements						
	5.9.4	RFF procedures						
	5.9.5	RFF Training						
5.10		**Disabled aircraft removal**	Doc 9137 ASM Pt. 9, Chapter 7	PASG	3			
	5.10.1	Disabled aircraft removal planning	Doc 9137 ASM Pt. 8, Chapter 14					
	5.10.2	Coordination with stakeholders	Doc 9137 ASM Pt. 5					
	5.10.3	Removal of disabled aircraft procedures	Annex 14, Chapter 9.3					
	5.10.4	Training and competency						
	5.10.5	Exercises and testing						
5.11		**Apron Management Service**	Annex 14, Chapter 9.5	PASG	3			
	5.11.1	Scope of Apron Management Service	Doc 9476 SMGCS Manual					
	5.11.2	Agencies involved in apron management service	Doc 9830 ASMGCS Manual					
	5.11.3	Procedures for apron management	Doc 9137 ASM Pt. 8					
	5.11.4	Training and competency						
5.12		**Apron Safety**	Doc 9137 ASM Pt. 9	PASG	1	Nov/2015	UKCAA	AOSWG
	5.12.1	Apron safety procedures	ACI ASH, Section 2					
	5.12.2	Apron cleaning and sweeping	Doc 9137 ASM Pt. 8, Chapter 10					
	5.12.3	Coordination with third parties	Annex 14, Chapter 9.6					
	5.12.4	Monitoring of third parties	DOC 9977 (fuel)					
	5.12.5	Fuelling operations						
	5.12.6	Passenger safety on the apron						
	5.12.7	Marshalling						
	5.12.8	Push-back Procedures						

Chap.	Art.N°	Title / Sub-title	Source Documents	Current activity (Panel / WG / TF / etc.)	Priority	Timeline	Drafting members	AP / Coordination
5.13		**Aerodrome Safety Training**	ACI ASH, Chapter 1.9	PASG	2			
	5.13.1	Safety induction training	Doc 9774					
	5.13.2	Specific safety training requirements						
5.14		**Runway safety**	Doc 9870 MPRI	PASG	1	Nov/2015	EASA / IFALPA	ADWG / AOSWG / VAWG
	5.14.1	Runway safety oversight and management	Doc 9476 SMGCS Manual					
	5.14.2	Runway incursion prevention	Doc 9830 ASMGCS Manual					
	5.14.3	Runway excursion prevention	Draft Manuel on RWY Safety Teams					
	5.14.4	Suspension of RWY operations						
5.15		**Aerodrome accident/incident safety occurrence reporting**	Doc 9137 ASM Pt. 8, Section 13	PASG (with inputs from Safety Management Panel)	2			
	5.15.1	Criteria for safety occurrence reporting	PANS-Aerodromes, Chapter 2					
	5.15.2	Agencies involved in the reporting	Inputs from Safety Management Panel					
	5.15.3	Investigation, follow-up, publication of report, retention of report	Annexe 19 / Doc 9859					
5.16		**Aerodrome vehicles and drivers**	Annex 14, Article 9.7	PASG	2			
	5.16.1	Driving on the aprons	ACI ASH, Chapter 3.15, 3.16					
	5.16.2	Driving on the manoeuvring area	Doc 9432					
	5.16.3	Vehicles requirements	Doc 9137 ASM, Chapter 19					
	5.16.4	Driver training, competency and permit programmes						
	5.16.5	Follow-me vehicles						
	5.16.6	Vehicle traffic markings and signage requirements						
5.17		**Aerodrome movement area maintenance**	Doc 9137 ASM Pt2, Friction measuring	PASG with inputs fromAOSWG (Pavement subgroup)	2			
	5.17.1	Aerodrome maintenance programme	Annex 14, Chapter 10					
	5.17.2	Maintenance of paved surfaces	Doc 9137 ASM Pt9					
	5.17.3	Maintenance of unpaved surfaces						
	5.17.4	Maintenance of visual aids						
	5.17.5	Maintenance of other aerodrome systems						

BEYOND AP/3....

AERODROME DESIGN AND OPERATIONS PANEL (ADOP)

Restructure of Annex14 Volume I vis-a-vis PANS-Aerodromes

ICAO

THANK YOU

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