



ICAO PSG Update- Status of High Tire Pressure Revision to Annex 14

FAA Working Group Meeting



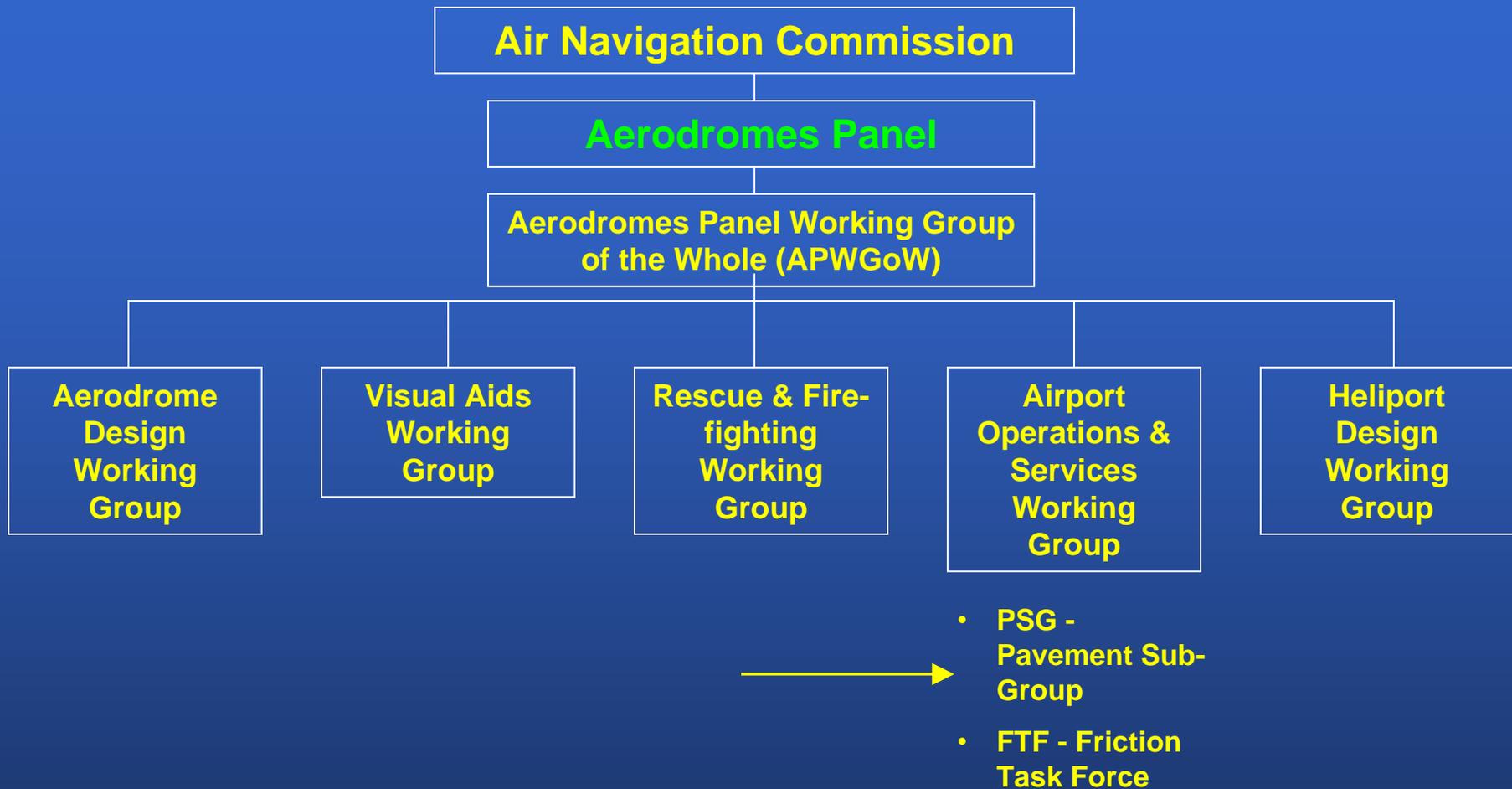
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April 15-17, 2013, Atlantic City, New Jersey

Work Structure of the ICAO Aerodromes Panel



AOSWG – Pavement Sub-Group (PSG) 2012 - 2015 Work Program

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- **Item 1: ACN Coding**
- **Item 2: PCN Methodology**
- **Item 3: Overload Guidance**
- **Item 4: Pavement Maintenance and Inspections**
- **Item 5: Pavement Surface Unevenness (Roughness)**
- **Item 6: Shoulders Objective & Performance-Unpaved areas**
- **Item 7: Impact of New and Emerging Design Principles on Pavement Rating System (old: Revised ACN Methodology)**
- **Item 8: Magnetic Anomaly**
- **Item 9: Drainage**

Future updates to member state pavement design practices in Doc 9157- Part 3 Pavements will also be incorporated.

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Item 1- ACN Coding(Greg Cline- FAA)

- **The PSG agreed that COMFAA 3.0 is to be adopted as the replacement ACN program in ICAO Document 9157, Part 3-Pavements, Appendix 2. Only the ACN functionality of COMFAA will be retained for ICAO usage.**
- **Aircraft library will be periodically updated as recommended by the aircraft manufacturers.**
- **The FAA will maintain and update COMFAA and provide the provision, through the source code files, that updating the FAA version will also ensure that the ICAO version is automatically updated.**

Item 2- PCN Methodology(Mike Roginski- ICCAIA)

- **Revisions to the current PCN guidance in Part 3- Pavements have been accepted by the PSG. Clearer definition of terms “unrestricted and unlimited” in the PCN nomenclature. Link provided to FAA COMFAA PCN software for member states having no formal PCN method.**
- **Aircraft tables in Part 3 updated to include more current aircraft and to update the gear nomenclature to the FAA standard specified in Order 5300.7 (i.e. DT now 2D)**

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Item 3- Overload Guidance (Cyril Fabre - ICCAIA)

- **The current ICAO overload guidance in Chapter 2 of ADM Part 3 allows the aircraft ACN to exceed the PCN by 10% for flexible pavements and 5% for rigid pavements. The PSG would like to establish a more technically based approach.**
- **FAA planned overload tests in 2013, reviewed by the PSG, will help establish a technical basis for how to handle overload.**
- **PSG overload survey has been sent through the ACI and ICAO regional offices to determine current member state overload practices- results to be reviewed in April meeting.**

■ Item 4- Pavement Maintenance (Lia Ricalde- ICAO)

- **Current proposal is to develop a check list of actions that are necessary for a proper pavement management system.**
- **ICAO document Annex 14-Aerodromes, most likely will make pavement management systems mandatory, and any proposal by the PSG will need to take inspection procedures and pavement condition assessments into account.**

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Item 5 – Surface Unevenness (Michael Roginski – ICCAIA)

- **The Boeing Bump Criteria, currently documented in the green pages of Annex 14, Volume 1, has been slightly modified, primarily clarifying the table of data defining the bump curves and associated regions of roughness (i.e. acceptable, excessive and unacceptable)**
- **The AOSWG has accepted the revisions and the ICAO Secretariat will now finalize the results through the annex 14 amendment process.**
- **Item 6, 10 – Unpaved Areas-Shoulders, RESA, Stopways (Michael Roginski – ICCAIA)**
- **Criteria needs to be developed for airports having unpaved areas which support occasional passes of aircraft, more typical outside the USA.**
- **CBR requirement for unpaved areas dependent on aircraft type- critical parameters such as wheel load and tire pressures will differentiate the aircraft groupings.**
- **Existing data from USAF C-17 document and Boeing gravel runway work done for early versions of the 727 and 737 operating in Canada.**

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Item 7: Impact of New and Emerging Design Principles on Pavement Rating System (old: Revised ACN Methodology) – Cyril Fabre – ICAAIA

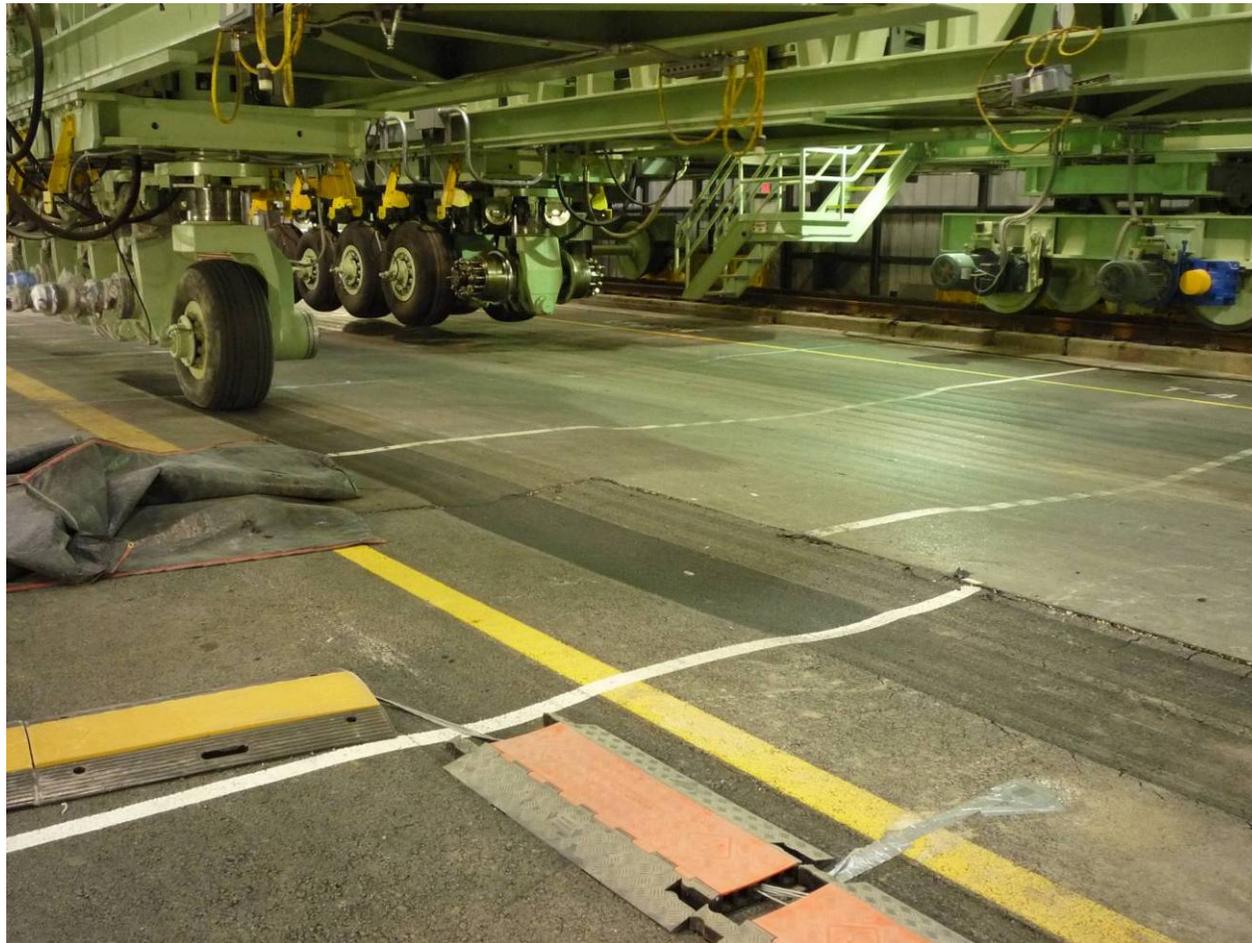
■ **Multi-layered elastic methods have been proposed to potentially replace the current CBR based ACN/PCN system. The outcome is that this new method is more in-line with current pavement design practice.**

■ **Potential concern over choosing a single software program for the PCN determination. Also, current ICAO guidance dictates that the state is free to use their own method for PCN determination.**

■ **The PSG has evaluated preliminary calculations based on French software Alize, and the FAA will continue this effort in 2013 using Faarfield as a comparison.**

Status of Revision to High Tire Pressure Categories

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Conclusions of Boeing/FAA and Airbus Tests

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- Rut depth variation increases simultaneously with temperature independent of tire pressure.
- Increase in tire pressure had an insignificant effect on the amount of rutting, with the observed difference between 254 psi and 218 psi being in the range of 0-4%.
- Test results indicate that rutting can be significantly reduced by using improved asphalt binders, i.e. PG 76-22 performed much better than PG 64-22.
- Both tests results clearly indicate that the tire pressure effect resulting from an increase from 1.5 MPa (218 psi) to 1.75 MPa (254 psi) will not affect adversely surface or base asphalt concrete layers, nor the structural capacity and life duration of typical airfield pavement structures.

Comments Received in 2012 from ICAO Member States

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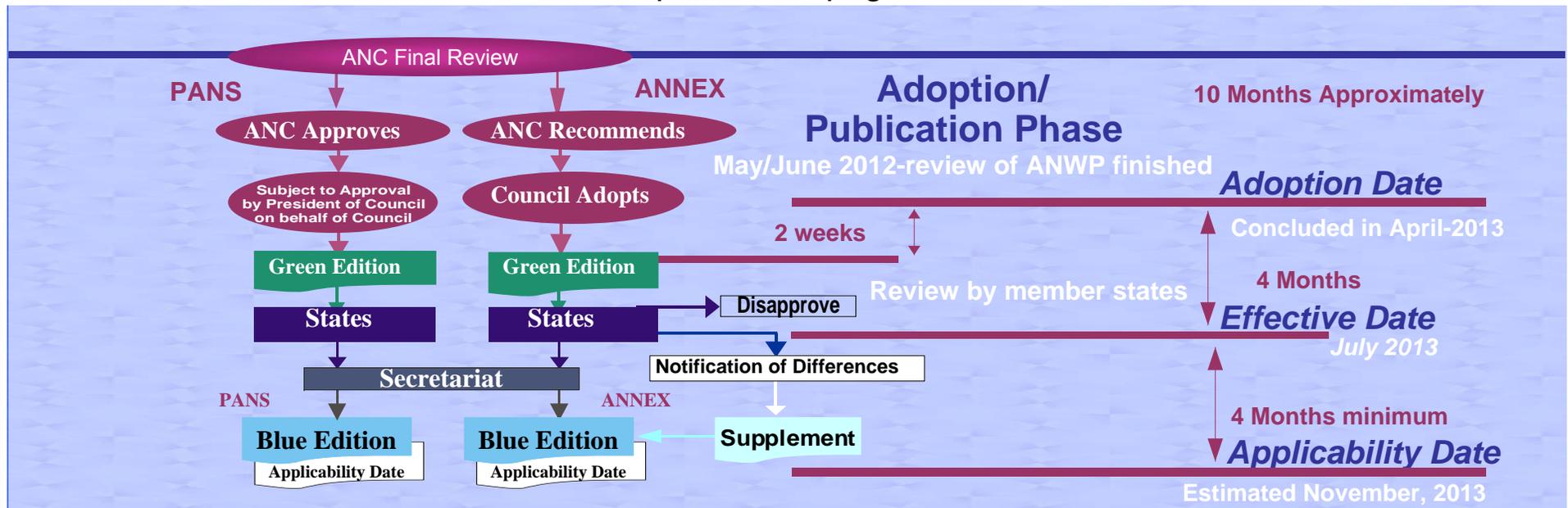
- Responses received from 62 contracting states and 5 international organizations.
- ICAO must respond to each and every comment. Note: ICAO provisions are minimum provisions, meaning that member states are free to adopt provisions more stringent in the interest of safety, regularity and efficiency. If ICAO were to mirror US requirements then ~ 90% of the world would not be able to comply.
- Most comments received were in favor of the revision to higher tire pressure categories.

Some exceptions- mostly minor:

- Tests did not consider pavement types other than asphalt
- Note making reference to potential damage to pavement due to higher tire pressures infers that if accepted as a standard then states will be mandated to implement a maintenance program to ensure safety.
- PCN example for all up mass rating in annex 14 based on older 747-400. Possibly replacing with 747-8 or A380 is more practical.

Proposal Adoption Phase-Current Status

- The ANC has reviewed the working paper prepared by the ICAO Secretariat-May/June of 2012 and endorsed it. The ANC is comprised of experts nominated by 19 countries, acting as technical advisors to the ICAO Council.
- Adoption by the ICAO Council follows. Council consists of members nominated by 36 states, simple majority needed to go forward. April 5 of 2013- Council has issued formal letter adopting the amendment.
- Member states are given 4 months to register disapproval after adoption date. If approved by simple majority of states the proposal becomes 'effective.' If disapproved it's 'back to the drawing board'
- Once approved (i.e. 'effective') then 4 additional months given before applicability date- estimated to be November, 2013. Replacement pages to annex 14 issued.



Annex 14, Vol 1 Chapter 2, section 2.6

Revision to tire pressure categories

- Both the ACI airport survey and the full-scale tests demonstrate that the proposed change of tire pressure limitations can be ratified without putting aircraft or airfield pavement at risk.
- They allow the ICAO tire pressure limit codes to be formally and permanently changed to be more consistent with both the performance of real world pavement and new generation aircraft.

Tire Pressure Category	Current ICAO Limits MPa (PSI), loaded	Proposed New ICAO Limits MPa (PSI), loaded
W	High	Unlimited
X	Medium: 1.50 (218)	High: 1.75 (254)
Y	Low: 1.0 (145)	Medium: 1.25 (181)
Z	Very Low: .50 (73)	Low: .50 (73)