ICAO Perspectives – AP AOSWG Pavement Subgroup Working Programme

Lia Ricalde
Aerodromes & Ground Aids Regional Officer
ICAO South American Regional Office
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XXIV WORLD ROAD CONGRESS - SEMINAR ON AIRFIELD PAVEMENTS

AERODROME PANEL (AP)
a) Terms of Reference

- To undertake specific studies in the field of aerodrome design and operations, as approved by the Air Navigation Commission and reflected in the work programme of the panel, with a view to advising the ANC on technically practical and operationally feasible ICAO provisions, as necessary, to meet the objectives specified in the work programme.
- In fulfilling this mandate, the panel will address safety-related issues relating to aerodrome planning and design, aerodrome certification, visual aids, **aerodrome operations and services** including rescue and fire fighting, as well as heliport design.

Aerodrome Panel Working Groups

- Aerodromes Design Working Group (ADWG)
- Aerodrome Operation and Services Working Groups (AOSWG)
  - Pavement Subgroup (PSG)
- Visual Aids Working Group (VAWG)
- Rescue & Fire Fighting Working Group (RFFWG)
- Heliport Design Working Group (HDWG)

AOSWG - PSG TOR

- The PSG is in charge of all the topics in relation with the airfield pavements (design, evaluation, classification …) with the exception of runway friction (Friction Task Force).
- Of primary importance is the acknowledgement that the Aerodrome Design Manual (ADM) Part 3 is out of date, reflects incorrect data and is in serious need of being updated.
- The fact that the ICAO Aerodrome Certification process relies on the ADM for baseline guidance is also a primary concern of the group.

AOSWG - PSG
2012 -2015 Work Programme

- 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
- Item 7: Impact of New and Emerging Design Principles on Pavement Rating System (old: Revised ACN Methodology)
- Item 8: Magnetic Anomaly
- Item 9: Drainage

PSG Work Programme

AOSWG/9 last meeting in July, 2010 validated the presented work programme for the Pavement Subgroup.

The PSG held a meeting at ICAO HQ 28-29 July 2011 to review the work program validated by AOSWG/9.

PSG members were assigned to each topic in order to distribute the workload and complete satisfactory progress of the work by 2015.

AOSWG – PSG – July 2011 Meeting 2012 -2015 Working Programme

Item 1: ACN Coding (Greg Cline – USA/FAA)

- PSG was tasked with replacing the current ICAO FORTRAN software code for ACN calculation found in Appendix 2, Doc 9157, *Aerodrome Design Manual*, Part 3 - Pavements (ADM Part 3).
- PSG is asking to move to Visual Basic code and to possibly include in the software the back-calculation of allowable take-off weights from the PCN values.
- FAA will provide a version of COMFAA for ACN computation at any weight. The software should include metric units for ICAO purposes.

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Item 2- PCN Methodology (Michael Roginski – ICCAIA)

- ADM Part 3 lacks guidance on how airports determine and assign PCN ratings.
- Initial proposal - provide a baseline method such as FAA PCN method for those countries with no current procedure in place.
- There is a lack of understanding on how to use the PCN system, key wording needs to be added to the guidance material.
- Addressing low frequency operations and pavement monitoring when ACN exceeds PCN should be also considered.

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Item 3- Overload Guidance (Cyril Fabre - ICCAIA)

- i.e. Aircraft operations – load or frequency - that exceed the original design intention and have a damaging effect not addressed in the original design.
- Chapter 2 of ADM Part 3 has the overload guidance when ACN exceeds PCN. The current 10% criteria for flexible pavements and 5% criteria for rigid pavements as noted in Annex 14, Volume I, Attachment A seems to be working sufficiently as a general guideline.
- However, it was noted that the state practices in ADM Part 3 may no longer be current and need to be revisited. Additionally, the overload frequency of 5% of all traffic needs to be re-evaluated, possibly considering only the traffic frequency similar to the overload aircraft.

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Item 4 – Pavement Maintenance and Inspections - Lia Ricalde – ICAO SAM AGA RO in coordination with FTF

- Pavement maintenance material and guidance is currently available from many organizations, ADM Part 3 should include guidance material on pavement management system (PMS).
- The ultimate goal should be to require a PMS for major airports as a standard and not just guidance material.
- AOSWG had proposed an upgrade of the current Annex 14, Volume I, paragraph 10.1.1 (dealing with aerodrome maintenance) recommended practice to a mandatory standard. PSG should stay current with developments in this area.
- Doc 9137, *Airport Services Manual*, Part 9 — *Airport Maintenance Practices s*hould be also reviewed by the PSG for any relevant material dealing with pavement maintenance.

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Item 5 – Surface Unevenness (Michael Roginski – ICCAIA)

- Pavement surface unevenness defect is one of the pavement parameter in direct connection with operational safety. Currently, there is no general guidance in ADM Part 3 dealing with surface unevenness or roughness.
- The Boeing Bump Criteria has been added to the green pages of Annex 14, Volume 1 and could be used as similar guidance in Part 3. This criteria only addresses single event type bumps, multiple events or bumps which have an impact on fatigue life of an aircraft should be considered for future work.

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Item 6 – Shoulders (David Gamper – ACI in coordination with ADWG)

- The ADWG needs to properly define the purpose of the shoulder area prior to addressing the structural strength considerations. There has been developed by the ADWG a matrix of potential shoulder revisions to be considered.
- Currently ADM Part 3 does not address shoulder or apron design specifically.
- The FAA advisory circular 150/5320-6E includes structural design details for shoulder pavement based on a minimum number of critical aircraft movements.
- The guidance provided in Part 2-Taxiways and Aprons section 1.2.64 and also Annex 14, Volume 1-shoulders section 3.2.5. should be revised as well.

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

- Since multi-layered elastic methods are currently used for flexible pavement design and finite element methods for rigid design, a new pavement rating system which takes these methods into account should be considered to replace the current ACN/PCN system.
- The PSG task going will propose possible techniques and methodologies for evaluation. This is considered a long term task but proposals could be assess.
- Current State practices in ADM Part 3 need to be updated, but the material should be included not in the body of Part 3 but as an appendix, more State practices such as China and Australia should be also considered.

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Item 8: Magnetic Anomaly – Serge Le Cunff – French DGAC

- A recent magnetic anomaly issue at London City airport was presented. Buried steel rails beneath the runway pavement had affected a small commuter aircraft's navigation equipment in the runway holding area.
- The final report from the UK investigation board should be reviewed and commented by the PSG.
- Due to the importance of this issue, it could be discussed and resolved prior to the next AP meeting in 3 years.
- The FAA compass pad calibration guidance should be reviewed a guidance material since currently ICAO lacks any in this area.

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Item 9: Drainage – Alice Krol – Transport Canada in coordination with the FTF

- Drainage performance of pavement depends on slopes, drainage performance of surrounding areas, microtexture and macrotexture and on appropriate maintenance.
- The meeting noted that a proposal was made in the ICAO State letter AN 4/1.1.52-11/41 to have drainage guidance developed by the Friction Task Force to be added to the green pages of Annex 14, Volume 1.
- The PSG comments noted that drainage is primarily a maintenance issue associated with slopes, pavement texture and grooving. Prior to any further work it was suggested to review Part 3-chapter 5 for current guidance in this area.

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lricalde@lima.icao.int