



| ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY



ICAO Workshop on Oversight of Instrument Flight Procedures

29 – 30 October 2024

ICAO IFP Oversight Requirements

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Workshop rationale, objectives and audience

ICAO Provisions – Annexes and PANS

- Annex 11 – Air Traffic Services
- Annex 6 – Operation of Aircraft
- Doc 8168 –PANS-OPS Vol II
- ICAO Doc 9906 – Quality Assurance Manual for Flight Procedure Design

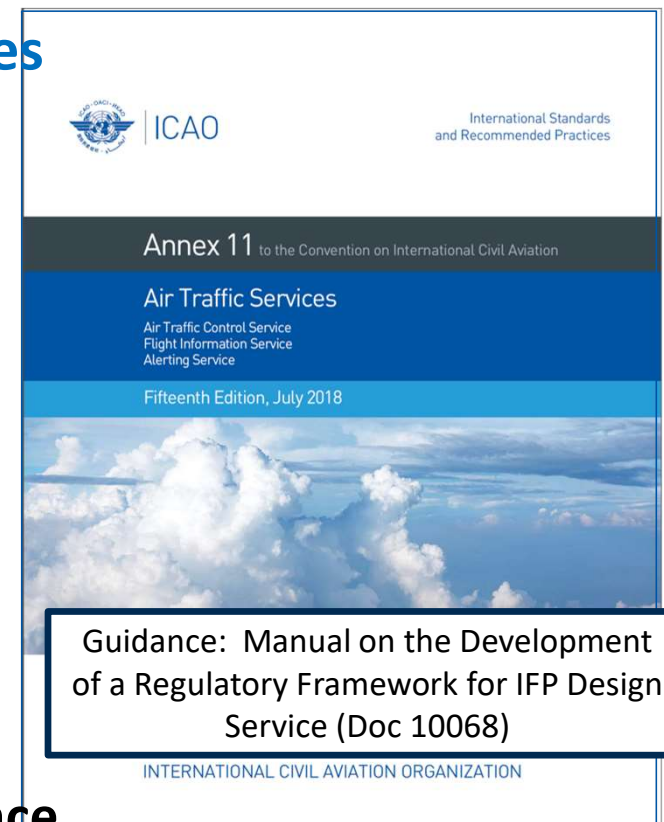
Workshop rationale, objectives and audience

- **Why the workshop?**
 - SSCs related to publication and oversight of IFPs
 - Second workshop in APAC Region
- **Workshop objective**
 - ICAO provisions for effective oversight of IFP
- **Target Audience**
 - CAA personnel engaged in oversight, design, validation, approval

ICAO Provisions – Annexes and PANS

- **Annex 11 Appendix 7 – State Responsibilities – IFP Design Service**

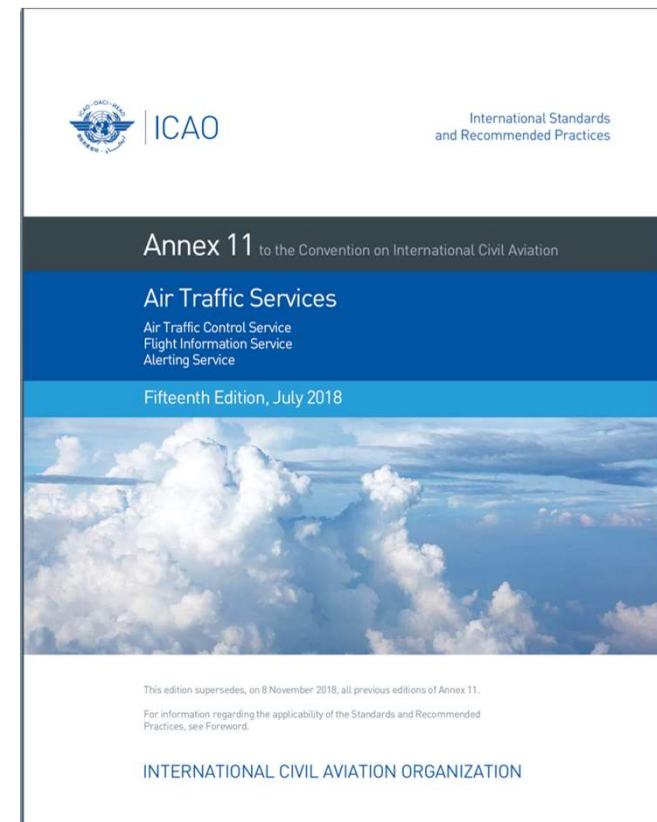
- Provide an IFP design service; and/or
- Provide a joint service (ICAO contracting States); and/or
- Delegated service to external agency/ies
- **State is responsible in all cases**
 - **All IFPs for aerodromes and airspace**
 - **Approvals**
 - **Design criteria**
 - **IFP design service regulatory compliance**



ICAO Provisions – Annexes and PANS

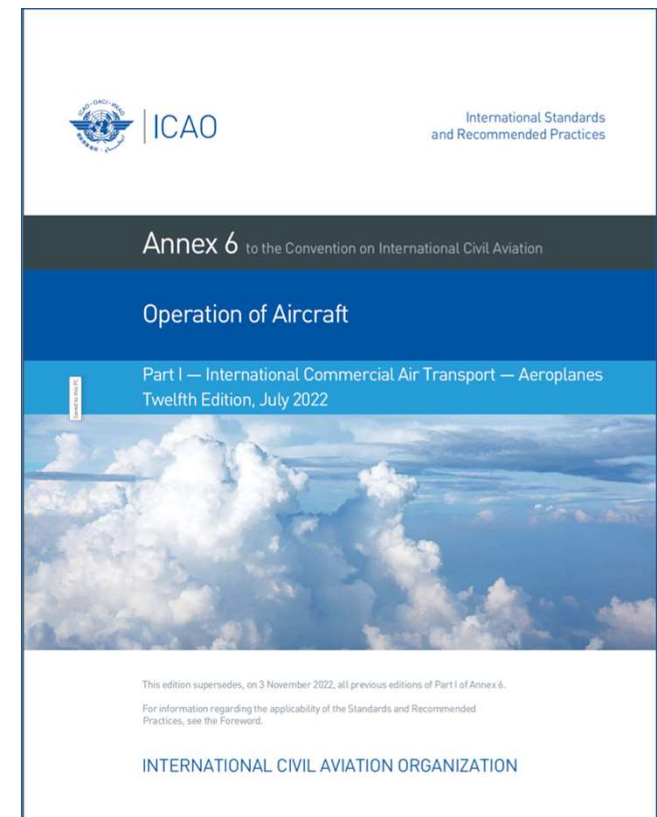
- **Annex 11 Appendix 7 – State Responsibilities – IFP Design Service**
 - State shall ensure IFP design service utilizes a quality management system at each stage of the design process.
 - State shall ensure maintenance and periodic review of IFPs
 - **Interval not exceeding five years**

Guidance: Doc 9906 Quality Assurance
Manual for Flight Procedure Design



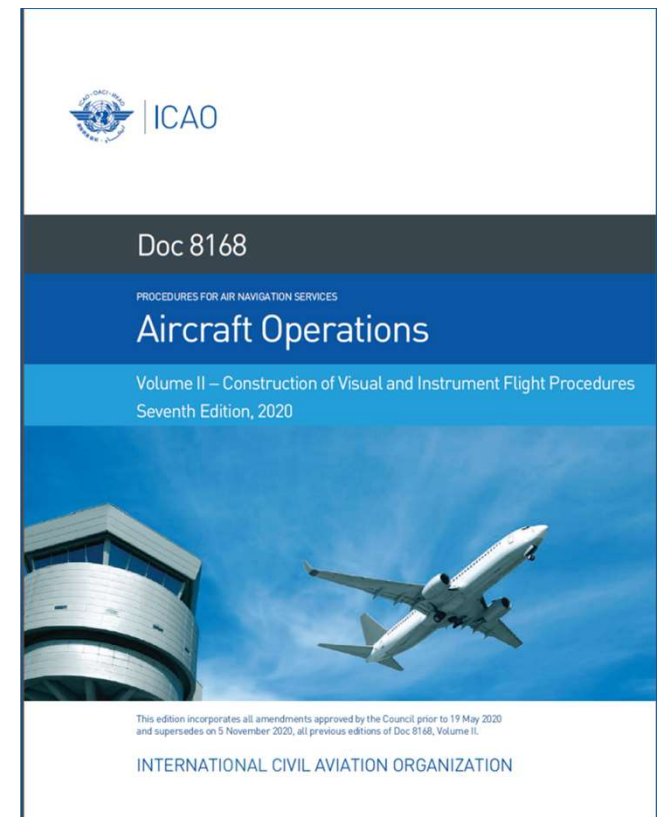
ICAO Provisions – Annexes and PANS

- **Annex 6 – Operation of Aircraft**
- IAP shall be approved and promulgated
 - One or more per instrument runway or aerodrome used for IFR operations
- IFR operations shall comply with approved IFP
 - As approved by the State in which the aerodrome is located.



ICAO Provisions – Annexes and PANS

- **Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) Doc 8168 Vol II – Construction of Visual and Instrument Flight Procedures**
- Procedure Design
 - Shall comply with State approved criteria
 - Shall be verified by other qualified procedure designer
 - Shall be subjected to periodic review
 - Maximum interval 5 years



ICAO Provisions – Annexes and PANS

- **Doc 8168 PANS-OPS Vol II**
- **4.2 – Instrument Flight Procedure Process**
- data acquisition, design and promulgation
- Compilation and verification of inputs, ground and/or flight validation
- Documentation for publication
- Process elements
 - Enablers, constraints, output, post-publication feedback
 - Original designs and periodic reviews

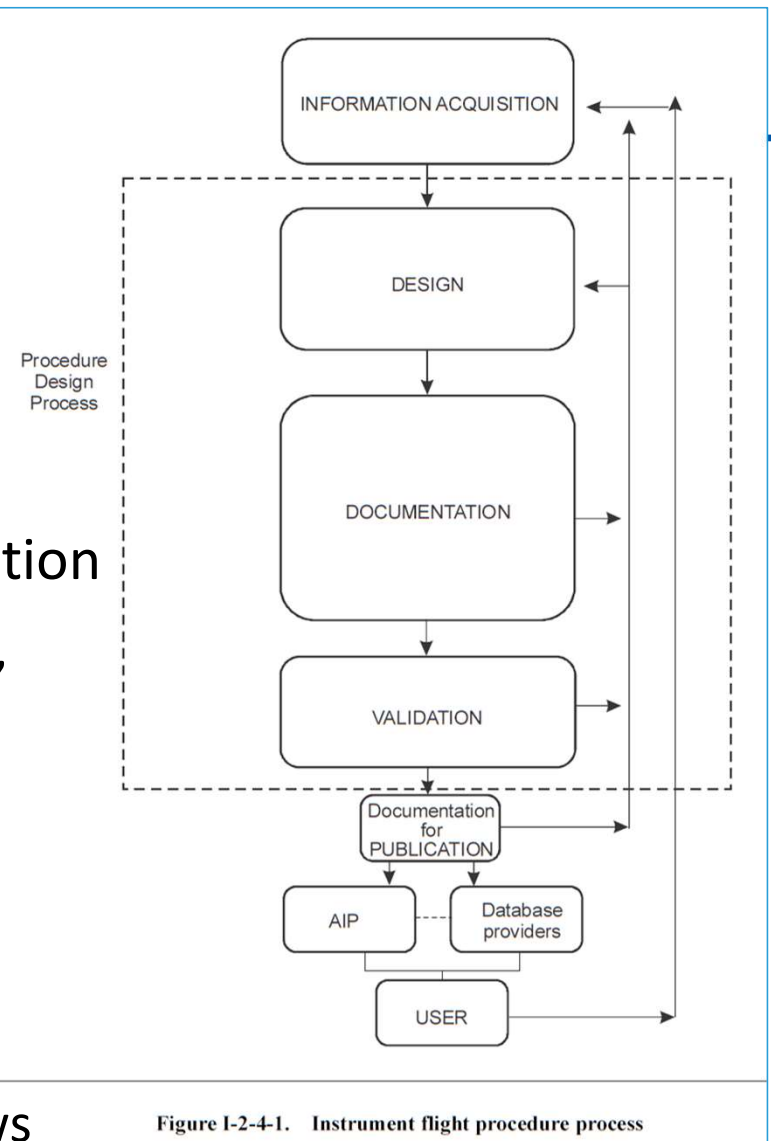
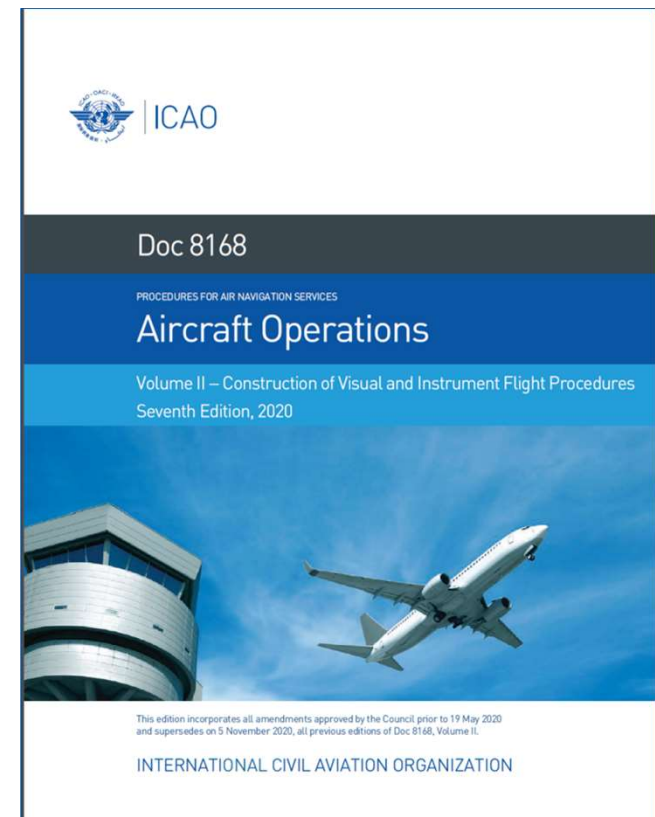


Figure I-2-4-1. Instrument flight procedure process

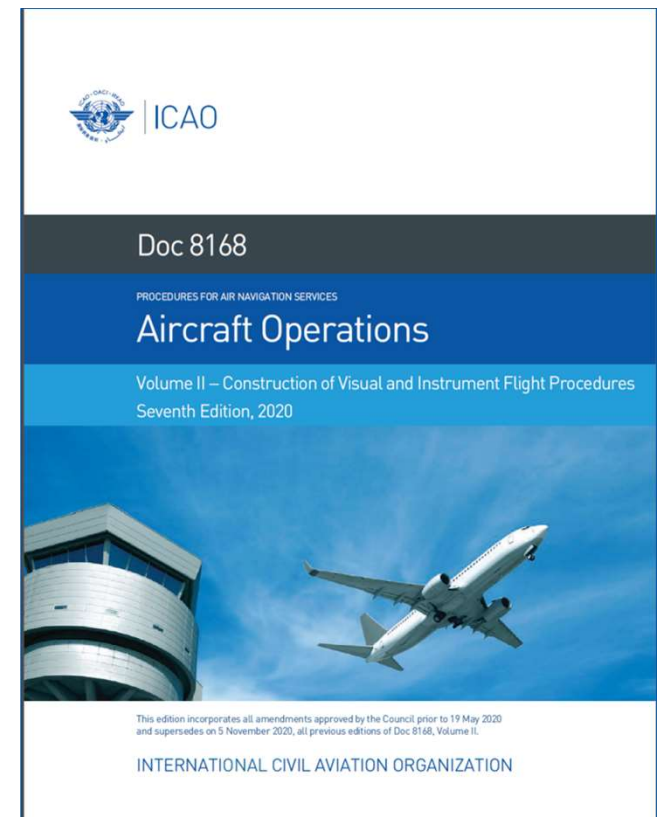
ICAO Provisions – Annexes and PANS

- **Doc 8168 PANS-OPS Vol II**
- **4.5 – Procedure Design Documentation**
- Three categories:
 - a) Documentation for publication in AIP
 - b) Documentation for transparency – details and assumptions used in design, supporting information
 - c) Additional documentation to facilitate ground and flight validation, and results



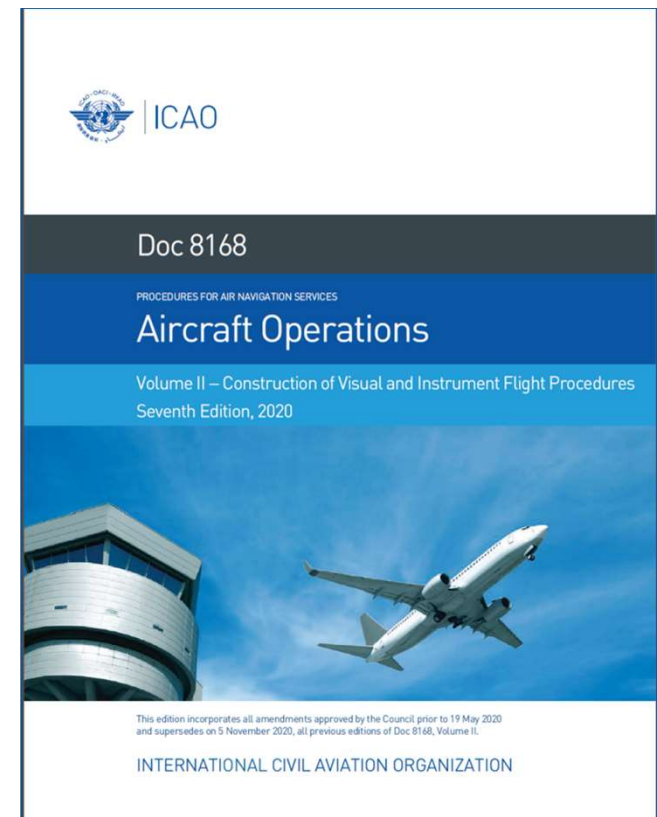
ICAO Provisions – Annexes and PANS

- **Doc 8168 PANS-OPS Vol II**
- **4.6 – Ground and Flight Validation**
- Necessary final quality assurance step
- Verification of all obstacle and navigation data, assessment of flyability
- Normally both ground and flight validation
- Ground validation always undertaken
- Conditions for dispensing with flight validation
 - Validation process in Doc 9906 Volume 5



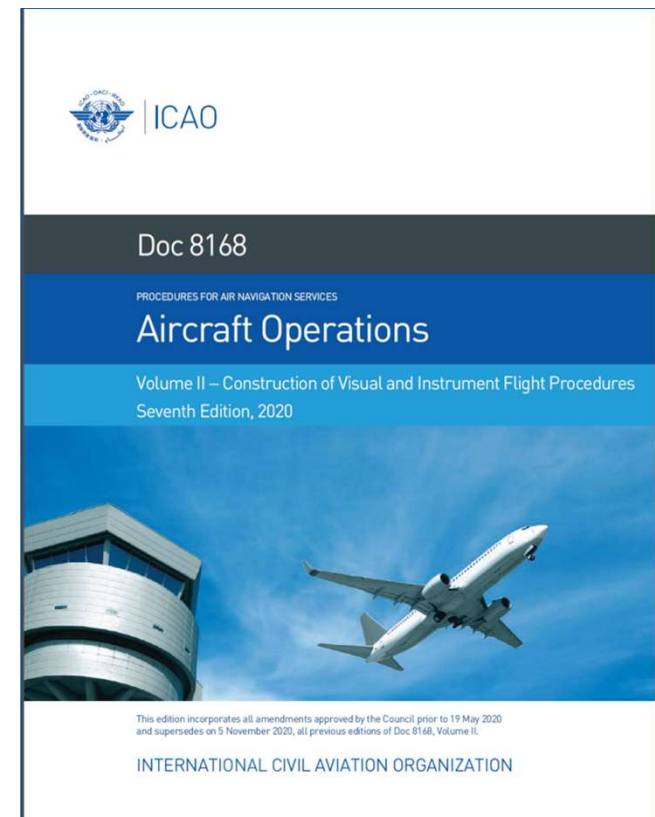
ICAO Provisions – Annexes and PANS

- **Doc 8168 PANS-OPS Vol II**
- **4.6.2 – Ground Validation**
- Review of entire IFP package
- Meant to catch errors in criteria and documentation, evaluate elements that will be evaluated in flight validation
- Address issues prior to flight validation
- Ground validation determines if flight validation is needed for modifications/amendments to published IFPs



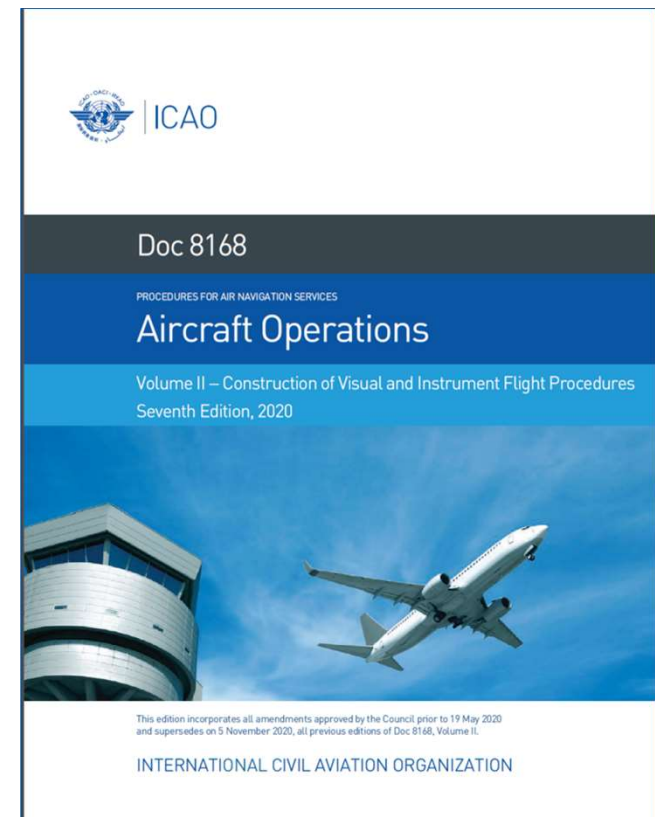
ICAO Provisions – Annexes and PANS

- **Doc 8168 PANS-OPS Vol II**
- **4.6 – Ground and Flight Validation**
- **Flight Validation**
- as part of initial certification
- As part of periodic quality assurance
- Qualified and experienced flight validation pilot - certified or approved by State



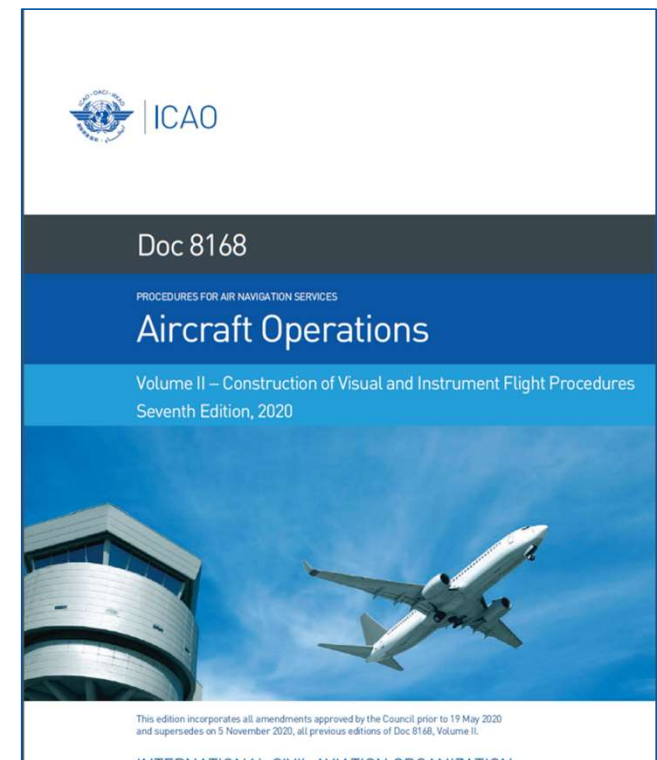
ICAO Provisions – Annexes and PANS

- **Doc 8168 PANS-OPS Vol II**
- **4.6 – Ground and Flight Validation**
- **Flight Validation Objectives**
- Assurance of adequate obstacle clearance
- Verify navigation data
 - Both published, and as used in design
- Verify all required infrastructure in place
- Assess flyability
- Evaluate charting, infrastructure, visibility, operational factors



ICAO Provisions – Annexes and PANS

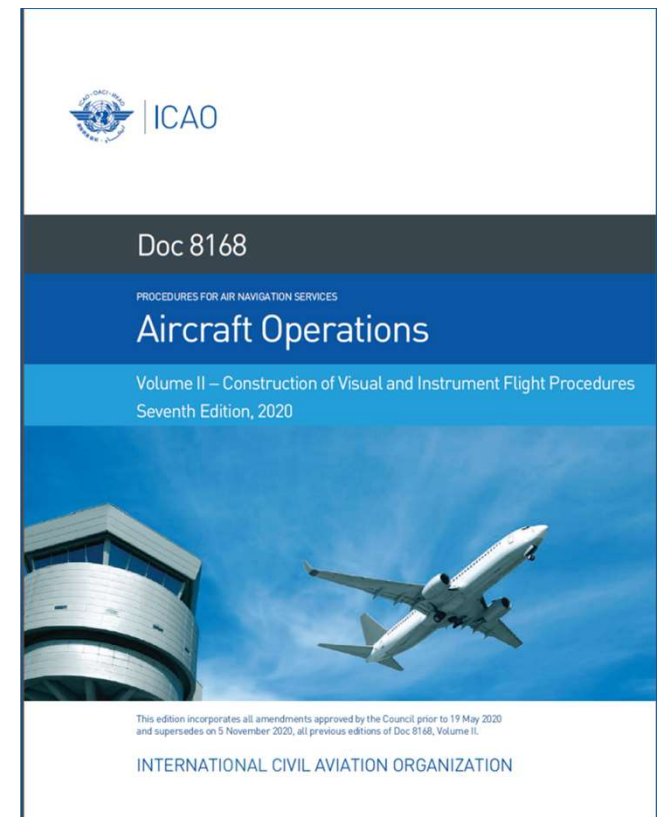
- **Doc 8168 PANS-OPS Vol II**
- **4.6 – Ground and Flight Validation**
- **Flight Validation Pilot quals/training**
- State written policy: minimum qualifications, recency, training, competency
- At least a commercial pilot licence, instrument rating, or equivalent authorized by the State
- Shall meet experience requirements of ATPL



Doc 9906 Volume 1 Annex B

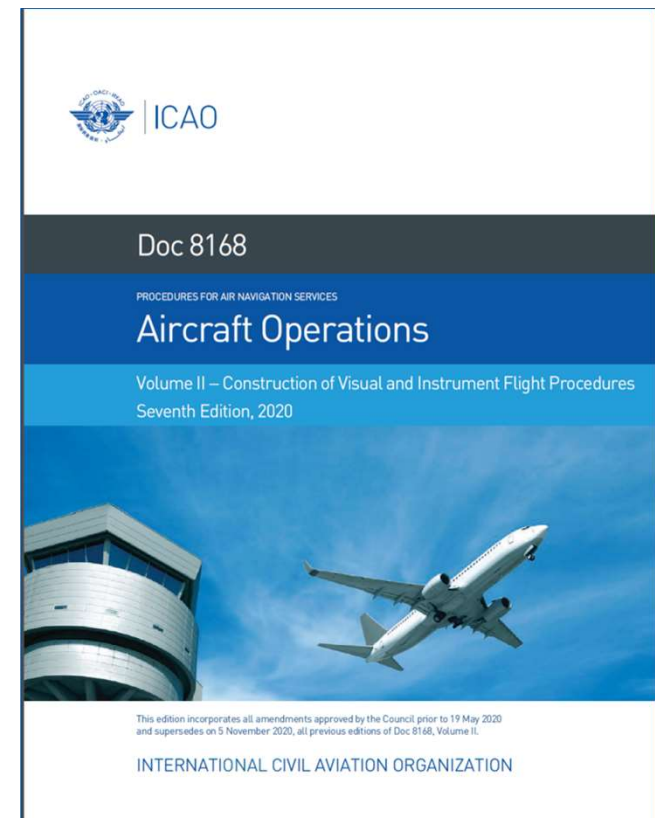
ICAO Provisions – Annexes and PANS

- **Doc 8168 PANS-OPS Vol II**
- **4.7 – Procedure Designer Qualifications and Training**
- State-established standards for competency
- Initial and recurrent training (interval established by State)
- Demonstrated basic level of competency
 - Knowledge of PANS-OPS and related ICAO provisions
 - Skills in design of procedures



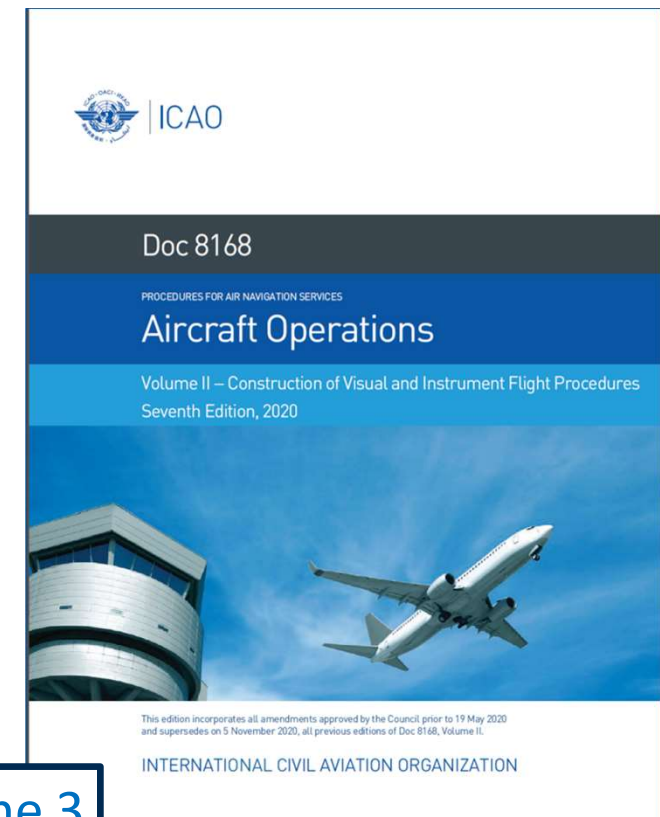
ICAO Provisions – Annexes and PANS

- **Doc 8168 PANS-OPS Vol II**
- **4.7 – Procedure Designer Qualifications and Training – Recurrent Training**
- Demonstrate basic level of competency
 - Knowledge of updated ICAO and other provisions
 - Maintenance and enhancement of knowledge and skills
- Evaluated by State at regular intervals
- Guidance – Doc 9906 **Vol 2**



ICAO Provisions – Annexes and PANS

- **Doc 8168 PANS-OPS Vol II**
- **4.8 – Procedure Design Automation**
- Potential to greatly reduce errors
- Standardize application of criteria
- States should use available software packages to design IFPs
- States responsible for safety of IFP
- Must ensure software packages have been validated.



ICAO Provisions – Annexes and PANS

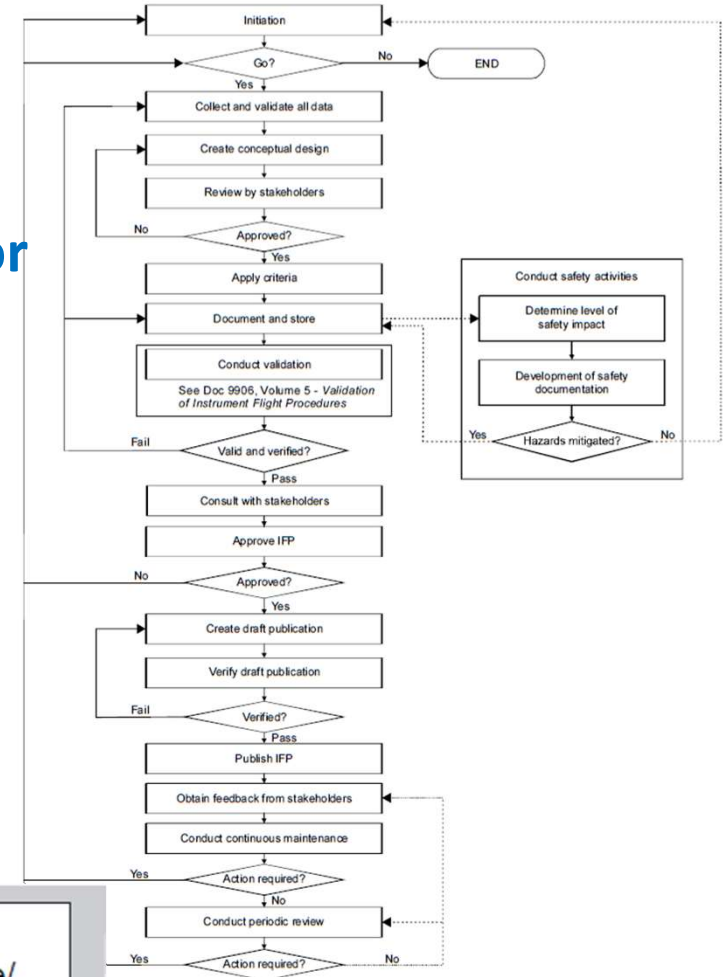
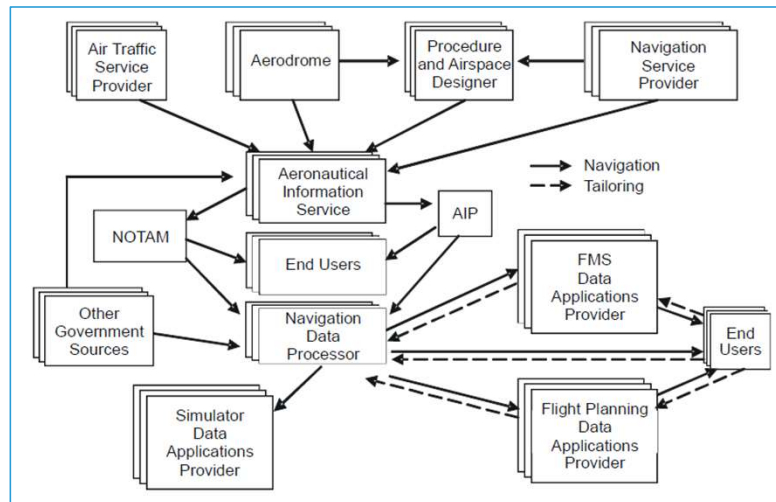
- **Doc 8168 PANS-OPS Vol II**
- **4.9 Safety Risk Assessment of Flight Procedure Designs**
- Safety risk assessment shall be conducted before implementing
 - New IFP
 - Change to existing IFP
- Detailed Guidance:

Manual on the Development of a Regulatory Framework for
Instrument Flight Procedure Design Service (Doc 10068)



ICAO Guidance Material

- **Doc 9906 Quality Assurance Manual for Flight Procedure Design Vols 1 - 6**





Thank You!