ICAO Workshop on Oversight of Instrument Flight Procedures(IFPs)

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Oversight Requirements of IFPs

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Why the Workshop?

- Recently some Significant Safety Concerns (SSCs) have been raised in the world, which are related to publications and the associated oversight/regulatory inadequacies of IFPs.
- The workshop intends to mitigate against such SSCs popping up in the APAC Region by strengthening the oversight framework in the States

The objectives of the ICAO workshop are to:

- Explain the provisions of ICAO documents for effective oversight of IFPs
- Present tools and best practices for the development of a strong oversight of IFPs
- Illustrate processes to use to develop effective implementation of oversight of IFPs

Target Audience:

CAA personnel engaged in Oversight of Design, Validation, Approval of IFPs

ANNEX 11, APPENDIX 7. STATE RESPONSIBILITIES CONCERNING AN INSTRUMENT FLIGHT PROCEDURE DESIGN SERVICE

1. A State shall:

a) provide an instrument flight procedure design service; and/or

b) agree with one or more Contracting State(s) to provide a joint service; and/or

c) delegate the provision of the service to external agency(ies).

2. **In all cases in paragraph 1 above, the State concerned shall approve and remain responsible for all instrument flight procedures for aerodromes and airspace under the authority of the State**.

3. **Instrument flight procedures shall be designed in accordance with State-approved design criteria.**

4. Each State shall ensure that an instrument flight procedure design service provider intending to design an instrument flight procedure for aerodromes or airspace under the authority of that State meets the requirements established by that State's regulatory framework.

Note.— Guidance material for regulatory framework for the oversight of instrument flight procedure design service is contained in the Manual on the Development of a Regulatory Framework for Instrument Flight Procedure Design Service (Doc 10068).

ANNEX 11, APPENDIX 7. STATE RESPONSIBILITIES CONCERNING AN INSTRUMENT FLIGHT PROCEDURE DESIGN SERVICE:

5. **A State shall ensure that an instrument flight procedure design service provider utilizes a quality management system** at each stage of the instrument flight procedure design process.

Note.— This requirement can be met by means of a quality assurance methodology, such as that described in PANS-OPS (Doc 8168), Volume II. Guidance for implementing such a methodology is contained in the Quality Assurance Manual for Flight Procedure Design (Doc 9906).

6. **A State shall ensure that maintenance and periodic review of instrument flight procedures for aerodromes and airspace under the authority of the State are conducted**. **Each State shall establish an interval for periodic review of instrument flight procedures not exceeding five years**.

Note.— Guidance on maintenance and periodic review is contained in the Quality Assurance Manual for Flight Procedure Design (Doc 9906).

Annex 6

4.4.8 Instrument flight procedures

4.4.8.1 ***One or more instrument approach procedures designed to support instrument approach operations shall be approved and promulgated*** *by the State in which the aerodrome is located to serve each instrument runway or aerodrome utilized for instrument flight operations.*

4.4.8.2 All aeroplanes operated in accordance with instrument flight rules shall comply with the instrument flight procedures approved by the State in which the aerodrome is located.

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4.4 PROCEDURE DESIGN

4.4.1 **Procedures shall be designed according to State-approved criteria**

4.4.2 **Each new or revised procedure shall be verified by a qualified procedure designer** other than the one who designed the procedure, to ensure compliance with applicable criteria.

4.4.3 **Published procedures shall be subjected to a periodic review,** including validation to ensure that they continue to comply with changing criteria, to confirm continued adequate obstacle clearance and that they meet user requirements. The individual States shall establish the interval for periodic review of instrument flight procedures according to the needs of the State. **The maximum interval for this review is five years.**

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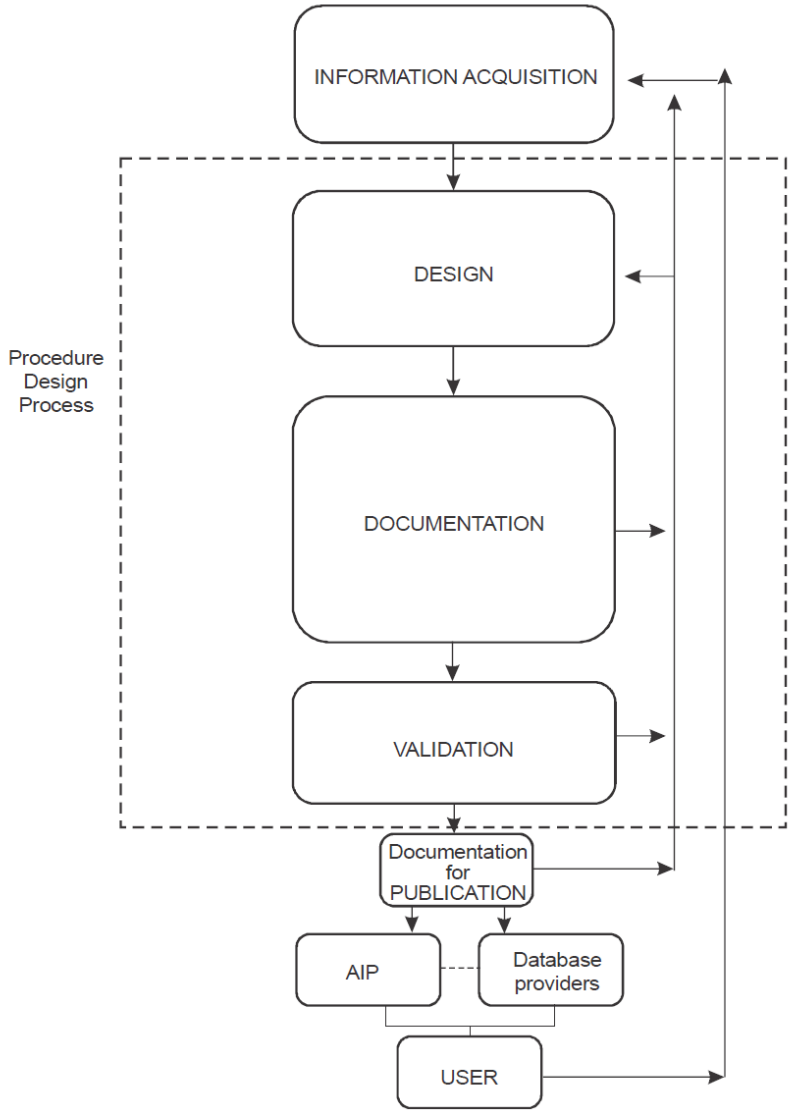
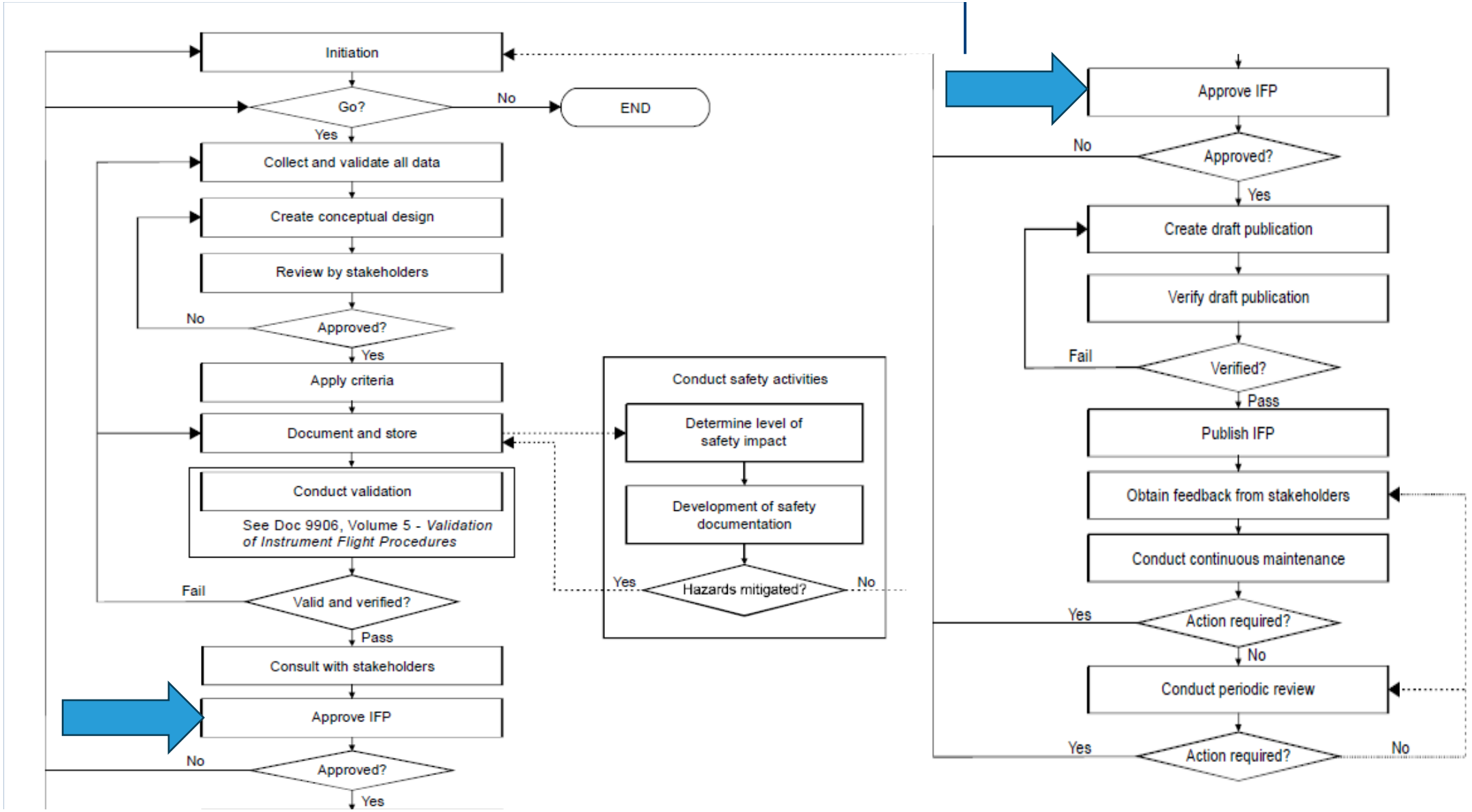


Figure I-2-4-1. Instrument flight procedure process



ICAO Doc 9906 V1

4.5 **PROCEDURE DESIGN DOCUMENTATION**

4.5.1 The documentation provided by the procedure designer is divided into three categories and includes:

a) documentation required for publication in the States' AIP in accordance with ICAO Annexes 4 and 15;

b) documentation required to maintain transparency concerning the details and assumptions used by the procedure designer, which should include supporting information/data used in the design, such as:

1) controlling obstacle for each segment of the procedure;

2) effect of environmental considerations on the design of the procedure;

3) infrastructure assessment;

4) airspace constraints;

5) the results of the periodic review and, for modifications or amendments to existing procedures, the reasons for any changes;

6) for any deviation from existing standards, the reasons for such a deviation and details of the mitigations applied to assure continued safe operations; and

4.5 **PROCEDURE DESIGN DOCUMENTATION**

5) the results of the periodic review and, for modifications or amendments to existing procedures, the reasons for any changes;

6) for any deviation from existing standards, the reasons for such a deviation and details of the mitigations applied to assure continued safe operations; and

7) the results of the final verification for accuracy and completeness (quality assurance checks) prior to validation and then prior to publication;

c) additional documentation required to facilitate ground and flight validation of the procedure and the results of the ground and flight validation.

4.5.2 **All documentation should be retained in accordance with States' procedures to assist in recreating the procedure in the future in the case of incidents and for periodic review and maintenance. The period of retention shall not be less than the operational lifetime of the procedure.**

4.6 **GROUND AND FLIGHT VALIDATION**

4.6.1 Validation

- Validation is the necessary final quality assurance step in the procedure design process, prior to publication.
- The purpose of validation is the verification of all obstacle and navigation data, and assessment of flyability of the procedure.
- Validation normally consists of ground validation and flight validation.
- **Ground validation shall always be undertaken**.
- When the State can verify, by ground validation, the accuracy and completeness of all obstacle and navigation data considered in the procedure design, and any other factors normally considered in the flight validation, then the flight validation requirement may be dispensed with.
- The process for the validation of flight procedures is detailed in the Quality Assurance Manual for Flight Procedure Design, Volume 5 — Validation of Instrument Flight Procedures (Doc 9906).

4.6 **GROUND AND FLIGHT VALIDATION**

4.6.2 Ground validation

- Ground validation is a review of the entire instrument flight procedure package by a person(s) trained in procedure design and with appropriate knowledge of flight validation issues.
- Meant to catch errors in criteria and documentation, and evaluate on the ground, to the extent possible, those elements that will be evaluated in a flight validation.
- Issues identified in the ground validation should be addressed prior to any flight validation.
- The ground validation will also determine if flight validation is needed for modifications and amendments to previously published.

4.6.3 **Flight validation**

4.6.3.1 Flight validation of instrument flight procedures should be carried out:

- As part of the initial certification
- As part of the periodic quality assurance program as established by the individual States
- It shall be accomplished by a qualified and experienced flight validation pilot, certified or approved by the State.

The objectives of the flight validation of instrument flight procedures are to:

a) provide assurance that adequate obstacle clearance has been provided;

b) verify that the navigation data to be published, as well as that used in the design of the procedure, is correct;

c) verify that all required infrastructure, such as runway markings, lighting, and communications and navigation sources, are in place and operative;

d) conduct an assessment of flyability to determine that the procedure can be safely flown; and

e) evaluate the charting, required infrastructure, visibility and other operational factors.

4.6.3 **Flight validation**

4.6.3.2

- Flight validation should not be confused with flight inspection.
- Flight inspection of instrument flight procedures is required to assure that the appropriate radio navigation aids adequately support the procedure.
- This is carried out as part of a formal flight inspection program and is performed by a qualified flight inspector using an appropriately equipped aircraft.
- The procedure designer shall be the originator of all data applicable to conducting a flight validation provided to the flight validation or flight inspection operations activity.
- The procedure designer should be prepared to provide briefings to the flight validation or flight inspection crews in those cases where flight procedures have unique application or special features.
- The procedure designer may participate in the initial validation flight to assist in its evaluation and obtain direct knowledge of issues related to the procedure’s design from the flight inspection or validation pilot and/or inspector.

4.6.6 **Flight validation pilot qualifications and training**

- The State shall establish a written policy requiring minimum qualifications, recency of experience, training and competency level standards for flight validation pilots, including those flight inspection pilots who perform flight validation of instrument flight procedures.
- Flight validation pilot qualifications shall include at least a commercial pilot licence with instrument rating, or an equivalent authorization from the State meeting the Annex 1 knowledge and skill requirements for issue of the commercial pilot licence and instrument rating, in the aircraft category (e.g. aeroplane or helicopter) appropriate for the procedure to be validated.
- In addition, flight validation pilots shall meet all the experience requirements for the airline transport pilot licence in the relevant category of aircraft (e.g. aeroplane or helicopter) as defined in Annex 1.

4.6.6 **Flight validation pilot qualifications and training**

- In order to achieve the safety and quality assurance objectives of the flight validation, each State shall ensure that flight validation pilots have acquired and maintain the required competency level through training and supervised on-the-job training.

Note.— Recommended qualifications and training, as well as guidance concerning the skills, knowledge and attitudes to be addressed in the training and evaluation of flight validation pilots can be found in Appendix B of Volume 1 (Flight Procedure Design Quality Assurance System) of the Quality Assurance Manual for Flight Procedure Design (Doc 9906).

- Additional detailed information and guidance concerning flight inspection, as well as qualifications and certification of flight inspectors, can be found in the ICAO Manual on Testing of Radio Navigation Aids, Volumes I, II,and III (Doc 8071).

4.7 PROCEDURE DESIGNER QUALIFICATIONS AND TRAINING

4.7.1 Each State shall establish standards for the required competency level for flight procedure design. Each State shall ensure that flight procedure designers have acquired and maintain this competency level through training and supervised on-the-job training (OJT).

4.7.2 Training for flight procedure design should at least include an initial training and recurrent training at periodic intervals. The State should establish the appropriate interval for recurrent training.

4.7.3 Initial training shall ensure that the flight procedure designer is able to demonstrate a basic level of competency that includes at least the following elements:

a) knowledge of information contained in the PANS-OPS, Volumes I and II and other related ICAO provisions relevant to the State; and

b) skills in the design of procedures.

PROCEDURE DESIGNER QUALIFICATIONS AND TRAINING

4.7.4 Recurrent training shall ensure that the flight procedure designer is able to demonstrate a basic level of competency that includes at least the following elements:

a) knowledge about updates in ICAO provisions and other provisions pertaining to procedure design; and

b) maintenance and enhancement of knowledge and skills in the design of procedures.

4.7.5 The State shall ensure that flight procedure designers have undergone an adequate, supervised OJT.

4.7.6 Competency of the flight procedure designer shall be evaluated by the State at regular intervals.

4.7.7 Guidance material for planning, implementing and evaluating flight procedure designer training is provided in the Quality Assurance Manual for Flight Procedure Design, Volume 2 — Flight Procedure Designer Training (Doc 9906).

4.8 **PROCEDURE DESIGN AUTOMATION**

4.8.1 Procedure design automation tools have the potential to greatly reduce errors in the procedure design process, as well as to standardize the application of the PANS-OPS criteria. For this reason **States should use the available software packages to design their instrument flight procedures**.

4.8.4 **As States are responsible for the safety of instrument flight procedures, they should ensure that the software packages used in the design of procedures have been validated**. The Quality Assurance Manual for Flight Procedure Design, Volume 3 — Flight Procedure Design Software Validation (Doc 9906) provides guidance to assist States in this task.

4.9 **SAFETY RISK ASSESSMENT OF FLIGHT PROCEDURE DESIGNS**

4.9.1 **A safety risk assessment shall be conducted before implementing a new flight procedure or a change to an existing flight procedure in accordance with the State regulatory framework**.

Note.— Detailed guidance material concerning the safety risk assessment is contained in the Manual on the Development of a Regulatory Framework for Instrument Flight Procedure Design Service (Doc 10068).

Thank You!

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