CIVIL AVIATION SAFETY AUTHORITY AUSTRALIA

Advisory Circular

AC 173-3(0) MAY 2003

INSTRUMENT FLIGHT PROCEDURE DESIGN APPROVAL of COURSES

CONTENTS

1. REFERENCES

- CASR Part 173 — Instrument Flight Procedure Design
- MOS Part 173 — Standards applicable to Instrument Flight Procedure Design

2. PURPOSE

This AC provides guidance and information to applicants for the approval and/or recognition of ICAO PANS-OPS courses.

3. STATUS OF THIS AC

This is the first AC to be issued on this subject

4. BACKGROUND

4.1 CASR Part 173 requires that in order to be employed as a ***qualified designer*** a person must have satisfactorily completed a CASA approved course in ICAO PANS-OPS Instrument Procedure design.

4.2 This AC sets out the matters that CASA may take into consideration in approving a course.

5. APPLICATIONS FOR APPROVAL

5.1 General

5.1.1 A person may apply for:

(a) a course to be approved by CASA, or

(b) a course to be considered as an approved course.

5.2 Application for approval of a course

5.2.1 A person may apply to CASA in writing to CASA for approval of a course.

5.2.2 The application must include, in accordance with MOS Section 3.3, information regarding:

- Syllabus
- Duration
- Lecturer(s)
- Provider/Institution

6. ASSESSMENT OF COURSES

CASA will consider the following in the assessment of a course:

6.1 Syllabus

6.1.1 An acceptable course syllabus is contained in Appendix A to this AC. The course syllabus should contain and include all basic procedure design elements including basic GNSS procedures.

6.1.2 The course shall define the pre-requisite for entry. Experience in procedure design shall not be a pre-requisite.

6.1.3 Practical course work must provide design experience at suitable stages of the course.

6.1.4 The syllabus must be adequate to enable a successful candidate to be capable of completing the design of a non-precision approach procedure under supervision of an experienced designer.

6.1.5 Applications must be accompanied by details of the assessment methods that are used and the provider's procedures for addressing unsatisfactory progress.

6.2 Duration of course

6.2.1 The syllabus contained in Appendix A is based on 6 weeks of full-time coursework. An application for approval must provide evidence that the course duration is sufficient to permit an average candidate to successfully achieve the course objectives.

6.3 Course lecturer

6.3.1 The applicant must provide details of the qualifications and experience of the course lecturer(s) or presenter(s).

6.3.2 Course lecturers must be experienced in instrument flight procedure design and possess recognised instructional qualifications.

6.4. Course provider

6.4.1 The applicant should provide details of the provider's experience in delivering PANS-OPS and other aviation courses, its organisation and the facilities available for the conduct of the course. CASA will take into account any information available in regard to courses conducted by the institution, and any approvals that may have been given by other aviation authorities.

6.4.2 Where the course is a new course CASA may require that additional information be provided or that the course be assessed on-site. Such assessment may require attendance or observation and monitoring of the course by CASA staff at the applicant's expense.

7. COURSES CONSIDERED TO BE APPROVED

7.1 CASA may consider a course to be an approved course, in accordance with CASR Part 173 MOS paragraph 3.3.1.3, where due to lapse of time since the course was completed, an assessment in accordance with Section 6 above is not possible.

7.2 This provision is intended to avoid disadvantaging persons who have obtained appropriate qualifications prior to the introduction of CASR Part 173.

7.3 A person applying for a course to be considered an approved course must provide documentary evidence as follows:

7.4 Evidence of course completion

7.4.1 Evidence must be supplied to show that the course was satisfactorily competed by the applicant.

7.4.2 Evidence may be in the form of a certificate issued by the course provider, or by a written statement from the institution.

7.4.3 Where such documentation has been obtained but has been lost or is no longer obtainable, CASA will consider an application supported by a statutory declaration or evidence such as a written statement from a person in a suitable position of authority. For example, a person who has been employed as a procedure designer may provide a statement from his/her employer that a course was satisfactorily completed.

7.4.4 On-the-job training is not considered to be an acceptable form of training for this purpose and evidence must be provided of a formal structured course.

7.5 Evidence of course standard

7.5.1 Evidence must be supplied to demonstrate that the course was of a standard that was appropriate to the design of instrument flight procedures at the time it was completed.

7.5.2 For example, a course, which, at the date of completion, was regarded by a Contracting State as an appropriate qualification for full-time employment as an instrument flight procedure designer, would be acceptable.

7.6 Evidence of additional training or practical experience

7.6.1 In circumstances where due to passage of time a course cannot be demonstrated to meet all of the above requirements, an applicant may provide evidence of training or practical experience that has been obtained since completion of the course.

7.6.2 CASA may take such evidence into account in determining that the training completed by the applicant should be considered to be an approved course.

8. APPROVED COURSES

8.1 Enquiries regarding approved courses may be made to:

Airspace, Air Traffic and Aerodrome Standards
CASA
GPO Box 2005 Canberra ACT 2601

Bill McIntyre
Executive Manager
Aviation Safety Standards Division

APPENDIX A

COURSE SYLLABUS

1. Executive Summary

- A. Organization of ICAO
- B. Organization of ICAO documentation
- C. Annexes and SARPS

2. Review of aviation principles and navigation principles for procedure design

3. General criteria

- A. Procedure segments
  1. Characteristics
  2. Obstacle clearance
  3. Principle of secondary areas
- B. Fixes
  1. Navigation performance
  2. Tolerance
  3. Application to area construction
  4. Forming fixes from navigation system and aircraft performance
- C. Aircraft speeds for procedure design
- D. True airspeed effects on procedure design
  1. Altitude
  2. Temperature
- E. Turn Radii
  1. Altitude effects
  2. Temperature
  3. Wind effects - ICAO wind spiral model
- F. Exercise

4. Initial approach

A. Alignment

B. Length

C. Area

D. Descent gradient

E. Obstacle clearance

5. Intermediate segment

A. Alignment

B. Length

C. Determining primary and secondary widths

D. Descent gradient

E. Obstacle clearance

6. Final approach segment

A. Runway alignment

B. Minimum length parameters

C. Maximum length conditions

D. Area width and navigation performance

E. Descent gradient

1. FAF altitude
2. Runway threshold location
3. Descent rate effect

F. Minimum obstacle clearance

1. Standard
2. Adjustments

G. Exercise

7. Missed approach: non-precision

A. Straight
   1. Initial phase
   2. Intermediate phase
   3. Final phase

B. Exercise

C. Turning
   1. Initial phase
   2. Intermediate phase
   3. Final phase
   4. Turn at altitude
   5. Turn at fix

D. Complex missed approaches

E. Exercise

8. Course reversal procedures

A. Types of reversal
   1. Racetrack
   2. Procedure turn
   3. Base turn

B. Template application and area construction

C. Exercise

9. Visual manoeuvre (Circling) approaches

A. Alignment

B. Descent gradient

C. Speed category application

D. Area construction

E. Obstacle evaluation

F. Final OCA/H vs visual OCA/H

10. Non-precision approach laboratory exercise

11. Precision approach

A. Principle of precision approach

B. ILS and MLS obstacle assessment surfaces (OAS)

C. Templates and system parameters

D. Height loss and height loss adjustments

E. Obstacle penetrations of precision segment

F. Missed approach

1. Straight
2. Turning

G. Establishing OCA/H

1. Operational
2. Approach obstacles
3. Missed approach obstacles
4. Obstacles after precision segment

H. ICAO Collision Risk Model (CRM)

1. General
2. Modelling obstacles
3. Building data base
4. Running CRM
5. Interpretation and analysis of results
6. Establishing OCA/H

I. Precision approach design laboratory

12. Earth-referenced navigation

A. Earth model

B. Waypoints

C. Path definition

13. Principles of area navigation (RNAV) and VOR/DME (RNAV)

A. Waypoint tolerance areas

B. Area construction

C. Turn construction

D. Obstacle evaluation

1. Straight segment
2. Turns
3. Missed approach areas

14. Global Navigation Satellite System (GNSS) Procedures

A. WGS-84 Earth model

B. Waypoints

C. Path definitions

D. Geodetic calculations for waypoint and path definitions

E. System performance parameters related to procedure design

F. Area construction

G. Basic form of procedures (Y)

H. Segments

1. Initial(s)
2. Intermediate
3. Final
4. Missed approach
    a. Straight
    b. Turning
    c. Combination
    d. Optional area construction

I. Application of course reversals

J. GNSS procedure design laboratory

15. Final Examination