Australian Government
Civil Aviation Safety Authority

# Workshop on Oversight of Instrument Flight Procedures

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# Overview

- Australian IFP context
- Regulatory arrangements
- Service provider certification
- Service provider oversight
- IFP Validation process
- IFP revalidation

# Australian IFP context

## Aerodromes and airspace

- Only Military aerodromes are owned by the Federal Government.
- Other aerodromes are owned/leased by private companies or local councils.
- 344 aerodromes and helicopter landing sites with IFPs,
  - 38 have air traffic control towers (Class C, D and Military)
- All other aerodromes and HLS's operate in Class G airspace
- Aerodromes with IFPs must be Certified by CASA (Part 139):
  - Annual surveys of OLS & monitoring of PANS-OPS surfaces.
  - CASA rules for building developments within 30NM.
  - Special HLS's are an exception to certification requirement.

# Australian IFP context

## Procedure types and navigation specifications overview

- ILS: 27 locations
- GLS: 2 locations (SYD & MEL)
- NDB/VOR NPAs: Approx. 120 locations
- PBN Navigation specifications:
  - GNSS is manated equipment for IFR aircraft
  - RNP 1 – Arrivals and departures (rollout ongoing)
  - RNP APCH – All locations (approx. 60% LNAV/VNAV)
  - RNP AR APCH – 22 locations (ICAO 9905 and proprietary criteria)

# Regulatory arrangements

- Requirements:
  - Civil Aviation Safety Regulation (CASR) Part 173
  - Manual of Standards (MOS)
  - Advisory circulars (AC)

  https://www.casa.gov.au/rules/regulatory-framework/casr/part-173-casr-instrument-flight-procedure-design
- Organisations are certified by CASA (4 currently: the ANSP & 3 private).
- Organisations subject to regular audit.
- Chief Designers approved by CASA, have regulated responsibilities.
- Design criteria: MOS 173, PANS-OPS and Doc 9905.

# Regulatory arrangements

## IFP Design Organisations - Certified Designer Requirements (include):

- Maintain and comply with an Operations Manual,
- Must have a chief designer approved by CASA,
- Verification processes for procedure design - 2 qualified designers independently check, one of whom did not carry out original design work.
- Appropriate organisation with sufficient qualified personnel,
- Training and checking program,
- Safety and Quality Management Systems,
- Arrangements with AIS and aerodromes (CASR 175),
- Use of certified navigation aids only (CASR 171),
- Maintenance and 5-yearly periodic review of procedures,
- Ensure all new procedures are flight validated by CASA prior to publication.

# Regulatory arrangements

## IFP Validation (not navigation aid flight inspection):

- Validation must be done by CASA (CASR 173.095).
- CASA flight validation pilot or contractor acting on behalf of CASA.
- Designer responsible for a new procedure participates on-board.
- Revalidation every five years (MOS 173)

# Service provider certification

**Process overview (entry control):**

- CASA certification required to perform design of IFPs (173.035).
- Organisations apply to CASA for a Procedure Design Certificate and approval of nominated Chief Designer.
- The application package includes a detailed operations manual, example designs for review and other supporting evidence (e.g. Chief Designer qualifications & experience).
- CASA performs a desktop assessment, when satisfied will move to an onsite review and Chief Designer interview.
- Procedure Design Certificate and Chief Designer approval issued once assessment completed successfully.
- CASA certificate is valid for 3 years and lists the IFP types the organisation is certified to design.
- Organisations must apply to CASA for renewal of their certification every 3 years.

# Service provider certification

## Assessment overview:

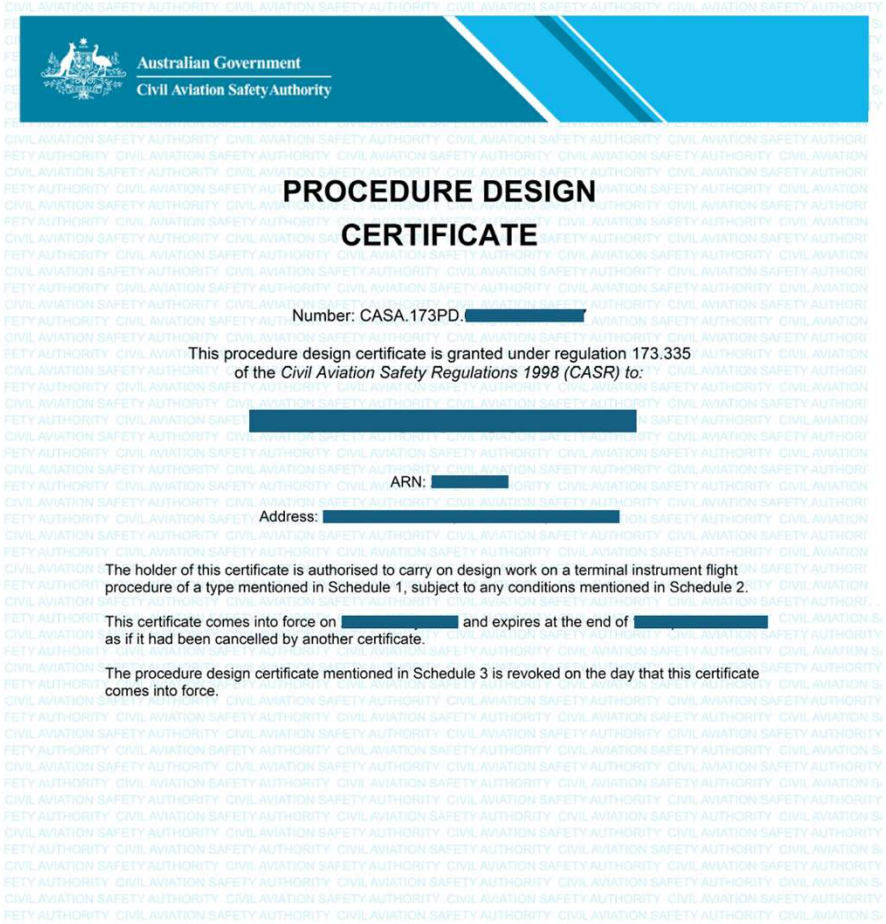
- Applications are assessed against the regulatory requirements. Applicant needs to address how they will comply with the requirements.
- Assessor worksheets derived from the regulation (CASR 173) and standards (MOS 173) are used to perform and record the assessments for the organisation and chief designer.

| Organisation Name: | | | Org ARN: | | | RM8 File Ref: | |
|---|---|---|---|---|---|---|---|
| Ref Doc | Ref | Assessment Worksheet Certified Designer | Related Reference | Present? | Satisfactory? | Organisation Document Reference | Comments |
| **PART C - Documentation, Records and Reference Material** | | | | | | | |
| **Operations Manual - Content** | | | | | | | |
| CASR | 173.075 | *Does certified designer, maintain an operations manual that meets the standards for operations manuals set out in the Manual of Standards. Does the designer's Operations Manual include:* | | | | | |
| MOS 173 | 2.1.1.1(a) | A table of contents based on the items in the manual, indicating the page number on which each item begins? | | | | | |
| MOS 173 | 2.1.1.1(b) | A description of the designer's organisational structure and a statement setting out the functions that the designer performs, or proposes to perform under CASR Part 173? | | | | | |
| MOS 173 | 2.1.1.1(c) | A description of the chain of command established, or proposed to be established, by the designer and a statement of the duties and responsibilities of any supervisory positions within the organisational structure? | | | | | |
| MOS 173 | 2.1.1.1(d) | A statement showing how the designer determines the number of operational staff required including the number of operational supervisory staff? | | | | | |
| MOS 173 | 2.1.1.1(e.) | A list of the design services that the designer provides, or proposes to provide? | | | | | |
| MOS 173 | 2.1.1.1(f) | A statement, for each design service, that identifies the location from where the service is provided, or proposed to be provided? | | | | | |
| MOS 173 | 2.1.1.1(g) | A statement of the responsibilities and functions for each position? | | | | | |
| MOS 173 | 2.1.1.1(h) | A description of the arrangements made or proposed to be made by the designer to ensure that it has, and will continue to receive, the information necessary for providing the service? | | | | | |

# Service provider certification



## Procedure design certificate example:



Australian Government
Civil Aviation Safety Authority

**PROCEDURE DESIGN CERTIFICATE**

Number: CASA.173PD.[redacted]

This procedure design certificate is granted under regulation 173.335 of the *Civil Aviation Safety Regulations 1998 (CASR) to:*

[redacted]

ARN: [redacted]

Address: [redacted]

The holder of this certificate is authorised to carry on design work on a terminal instrument flight procedure of a type mentioned in Schedule 1, subject to any conditions mentioned in Schedule 2.

This certificate comes into force on [redacted] and expires at the end of [redacted] as if it had been cancelled by another certificate.

The procedure design certificate mentioned in Schedule 3 is revoked on the day that this certificate comes into force.

**Schedule 1 - Terminal instrument flight procedures**

- Non-precision Approach (Ground-based)
- Non-precision Approach (RNP APCH)
- Precision Approach (Ground-based)
- Precision Approach (GBAS)
- Approach with Vertical Guidance (APV)
- Required Navigation Performance Authorisation Required Approach (RNP AR APCH)
- Departure

**Schedule 2 - Conditions**

# Service provider certification

**Regulator considerations & lessons learnt:**

- Early engagement with applicants to understand their intentions and scope of planned activities (pre-application meeting).
- Ensure appropriate assessment records are kept (ideally these are standardised assessment templates).
- Ensure applicants understand the ongoing compliance requirements following certification, including regular audits by the relevant authority and any recertification requirements.
- Applicants should develop a compliance matrix to map the regulatory requirements against their documents. Provides the applicant and assessor some assurance that each regulatory requirement has been considered and provided for.
- Requirements for an SMS may be new for an applicant. CASA has guidance material for scaling an SMS as appropriate for the size of the organisation.
- Regulations are written by lawyers: it is to be expected that clarification will need to be provided whilst the applicant develops their documents.

# Service provider oversight

## Overview:

- Oversight by Process and Oversight by Output (Doc 10068) - both conducted.
- Regular audits conducted every 12 to 18 months under CASA's National Oversight Plan.
- Additional audits may be conducted in response to specific issues.
- Oversight is also conducted through:
  - Validation of new procedures. New procedures must be validated by CASA prior to publication in AIP (173.095).
  - Monitoring of occurrence reports.
  - Other industry intelligence received by CASA.

# Service provider oversight

## Audit activities:

- All CASA surveillance events (audits) are conducted in accordance with the CASA Surveillance Manual (CSM), it contains all the audit procedures.

  https://www.casa.gov.au/legacy-search/manuals-and-handbooks/surveillance-manual

- Types of surveillance:
  - Level 1 – surveillance event:
    - Systems audits (most common for IFP scheduled events);
    - Remote
    - Post-authorisation reviews
  - Level 2 – Surveillance event: Less formal event, narrower scope and may be specific to one system, or in response to a safety occurrence.

# Service provider oversight

## Audit activities:

- Audit preparation: Review documents, current designs, occurrences, other intelligence.

- Conduct audit:
  - Entry meeting: Outlines the audit scope and administrative matters.
  - Audit sessions: Authorization holder updates, documentation review/sampling, training program, safety & quality management, design sampling, maintenance, periodic reviews.
  - Exit meeting: Summary of topics discussed and issues/preliminary findings.

- Audit reporting:
  - Audit lead drafts report – peer reviewed (standard template).
  - Report is approved and issued to the authorisation holder.
  - Standard response times apply as outlined in the CSM.
  - Authorisation holder response to safety findings (regulatory breaches) must include:

    Remedial action, root cause analysis and corrective action, supported by evidence.

# Service provider oversight

## Regulator considerations & lessons learnt:

- Oversight not just limited to audits. Regular engagement can proactively address issues early.
- Aircraft operator feedback and other industry reports can be a valuable source of intelligence for oversight of IFP design organisations.
- Ensure audit activities are transparent to the authorisation holder and all issues are communicated clearly throughout the audit and summarised at the closing meeting (no surprises when the final report is received).
- Remote audits may be necessary occasionally (e.g. COVID) and are a valuable tool when the scope is very limited such as for a document review.
- ICAO State Oversight Manual recommends:
  - on-site audits and/or inspections to verify technical aspects and assess the service provider's organization, competence and implementation of its operating procedures, and
  - surveillance activities.. include conduct of on-site inspections.. to proactively verify that.. approval holders continue to meet established requirements & function at the level of competency & safety required by State
- IFP design audits are highly technical, video conferencing has limited value. Issues include limited access to staff, documents, design files and tools. Time differences, video conferencing technology and language differences often mean that in-depth technical questions and demonstrations are not practically possible.

# IFP Validation

## Overview:

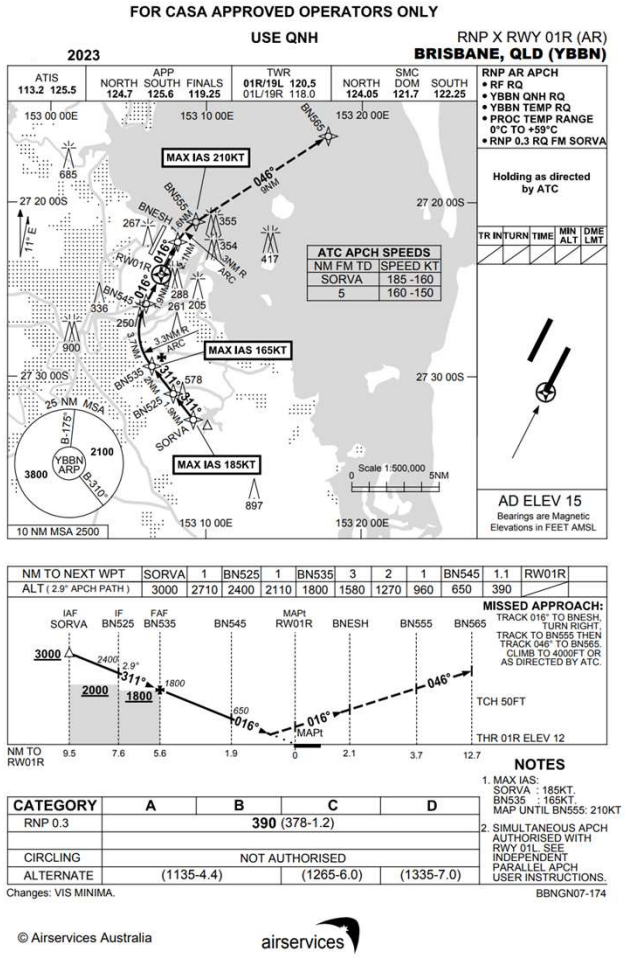
- Validation process complies with MOS 173 and Doc 9906.
- Validation phases:
  1. Pre-validation (desktop review)
  2. Simulator evaluation (when required)
  3. Flight validation (aircraft on-site)
  4. Procedure Validation Certificate issued as IFP approval

# IFP Validation

## Pre-validation (desktop review):

Validation package supplied to CASA by Certified Designer after internal QA, includes:

- Publication-ready procedure plates,
- Aerodrome chart,
- Waypoint & threshold coordinates in WGS-84,
- Procedure coding table,
- Minimum altitude and visibility calculations for approaches, circling, holding and MSAs,
- Geo-referenced charts/KMLs showing the nominal track, primary & secondary containment areas, and critical obstacle for each segment.

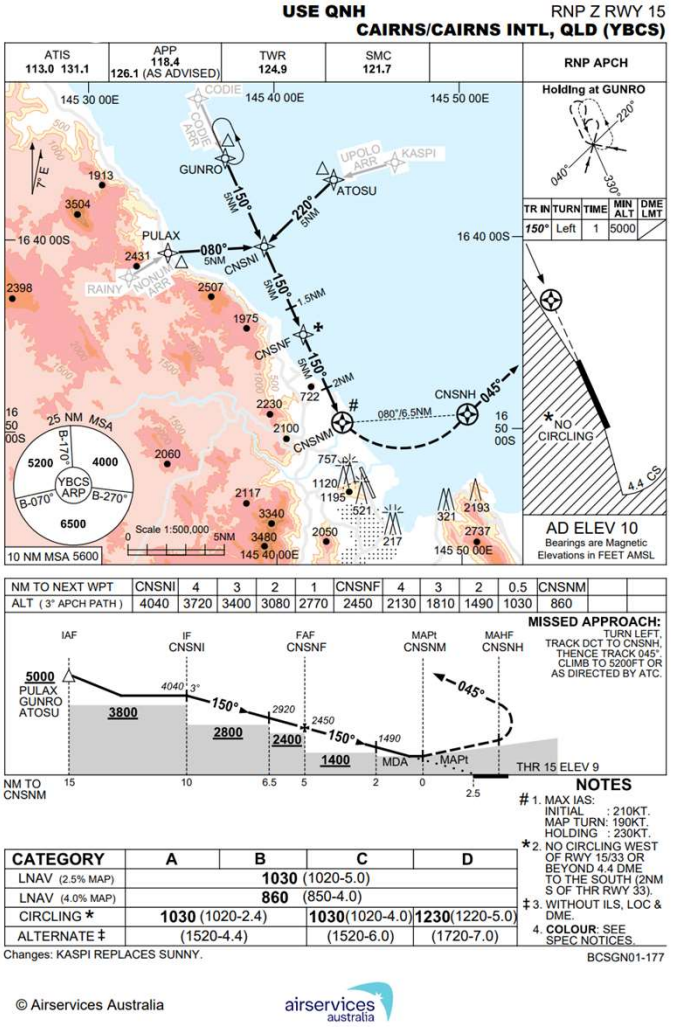


# IFP Validation

## Pre-validation (desktop review):

Validation package (cont.) – includes:

- Critical obstacles for each segment,
- Design parameters used, e.g. ISA+30, historical wind information,
- Terrain data source and accuracies,
- Confirmation that the aerodrome meets the standards required for published IFP,
- Confirmation that the procedures comply with MOS 173 Sections 8.1.1.3 Overlapping Procedures and 8.1.1.4 Airspace Buffers,
- Highlight any variations from procedure design criteria,
- Any other information that the designer considers appropriate.



# IFP Validation

## Pre-validation (desktop review):

Desktop review includes:

- Chart formatting – correct and standardized,
- Tracks/distances/altitudes/vertical path,
- PANS-OPS and MOS 173 compliance,
- Waypoint names,
- Review critical obstacles – locations & impact on design,
- Aerodrome infrastructure appropriate,
- Any PBN requirements,
- Presentation of airspace incl. neighboring aerodromes,
- Text and notes/are easily understood,
- Differences to standard criteria – consider operator approvals/exemptions.
- Recommended navigation database table: Path terminators, waypoint types, courses, turns, altitudes, speeds, vertical path angles, RNP values.

| | |
|---|---|
| Aerodrome (ICAO) | YBBN |
| Procedure Name | RNAV-X (GNSS) RWY 01L |
| Effective Date | 21 MAY 2020 - Draft v4.0 |
| PBN Nav Spec | RNP-AR |

- Recommended Coding

| Sequence Number | Fix Identifier (WAYPOINT NAME) | Path Terminator | Flyover (Y, -) | Course °M | Course °T | Mag Var +°E / -°W | Turn Direction (L/R) | Altitude (FT) (+, -, @) | Speed Constraint (KT) | Leg Distance (NM) | Time (MIN) | VPA (°) | TCH (FT) | Arc Centre Fix | Arc Radius (NM) | RNP Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | RUSVA | IF | | | | | | +4000 | -185 | | | | | | | |
| 20 | BN500 | TF | | 106 | 116.55 | 10.98 | | 3000 | | 4.9 | | | | | | 0.27 |
| 30 | BN510 | TF | | 082 | 093.28 | 10.98 | | 2240 | | 2.5 | | 2.90 | | | | 0.27 |
| 40 | BN520 | RF | | | | 10.98 | L | | | 3.0 | | 2.90 | | RBN01 | 2.62 | 0.27 |
| 50 | RW01L | TF | Y | 016 | 027.07 | 10.98 | | 63 | | 4.1 | | 2.90 | 50 | | | 0.27 |
| 60 | BBZSH | TF | | 016 | 027.05 | 10.98 | | | | 1.9 | | | | | | 1.00 |
| 70 | BN530 | RF | | | | 10.98 | L | | -210 | 1.6 | | | | RBN02 | 3.00 | 1.00 |
| 80 | | FA | | 346 | 357.04 | 10.98 | | +4000 | | | | | | | | 1.00 |

| | |
|---|---|
| Remarks | Altitude at BN520 intentionally left blank. |

# IFP Validation

## Pre-validation (desktop review):

- Pre-validation checklist completed.
- Remarks/considerations for validation activities noted e.g.:
  - Flyability considerations
  - Impact of any non-standard procedures
  - Obstacle assessment, especially in non-surveyed areas (highlight potential data discrepancies for onsite check).
  - Amendments to charts and/or coding table
  - New aerodromes have infrastructure commissioned
  - Runway markings, PAPIs, WDI/AWIS, etc
  - ATC, aerodrome operator notified
  - NOTAM and press release published
- Procedure approved for flight validation, and simulator validation where required.

| PRE VALIDATION CHECKLIST | | | | |
|---|---|---|---|---|
| Date: | Insert Date | Validation Type: | Click to select | |
| Organisation: | Click to select | Evaluator Name: | Click to select | |
| Procedure Title: | RNAV-Z(GNSS) RWY XX<br>RNAV-Z(GNSS) RWY XX | PBN Nav Spec: | Click to select | |
| Location: | AD NAME | Runways: | XX | XX |
| Airport: | AD NAME (ICAO) | RM8: | FXX/XXXX-XX | |

| PRE-FLIGHT VALIDATION | SAT | UNSAT |
|---|---|---|
| | Click to select | |
| 2. Data verification (e.g. aerodrome/heliport, aeronautical, obstacle, ARINC coding) | Click to select | |
| 3. Location of the controlling obstacles | Click to select | |
| 4. Graphical depiction (Chart) correctness and complexity | Click to select | |
| 5. Intended use and special requirements | Click to select | |
| 6. Overall design is practical, complete, clear and safe | Click to select | |
| 7. Consider impact on the procedure of differences to standard design criteria | Click to select | |
| 8. Segment lengths and descent gradients allow for deceleration/ configuration | Click to select | |
| 9. Comparison of FMS navigation database with the IFP design, coding, and relevant charting information | Click to select | |
| 10. Flight Validation Reports available | Click to select | |
| 11. Charting of notification of cold/warm temperature limits | Click to select | |
| 12. Overlapping secondary aerodrome procedures | Click to select | |
| 13. Airspace containment | Click to select | |
| 14. Prohibited, Restricted or Danger Areas | Click to select | |
| 15. Runway strip width – OCH adjustment | Click to select | |
| 16. IWDIs/AWIB | Click to select | |
| 17. Runway edge lighting | Click to select | |
| 18. Aerodrome Registered/Certified | Click to select | |
| 19. TAF available | Click to select | |
| 20. Aerodrome QNH & temp available | Click to select | |

| REMARKS: |
|---|
| |

| | | |
|---|---|---|
| Simulator evaluation required | YES | NO |
| Flight evaluation required | YES | NO |
| SATISFACTORY FOR FLIGHT VALIDATION | UNSATISFACTORY FOR FLIGHT VALIDATION | |

| EVALUATOR SIGNATURE: |
|---|
| Insert Date |

# IFP Validation

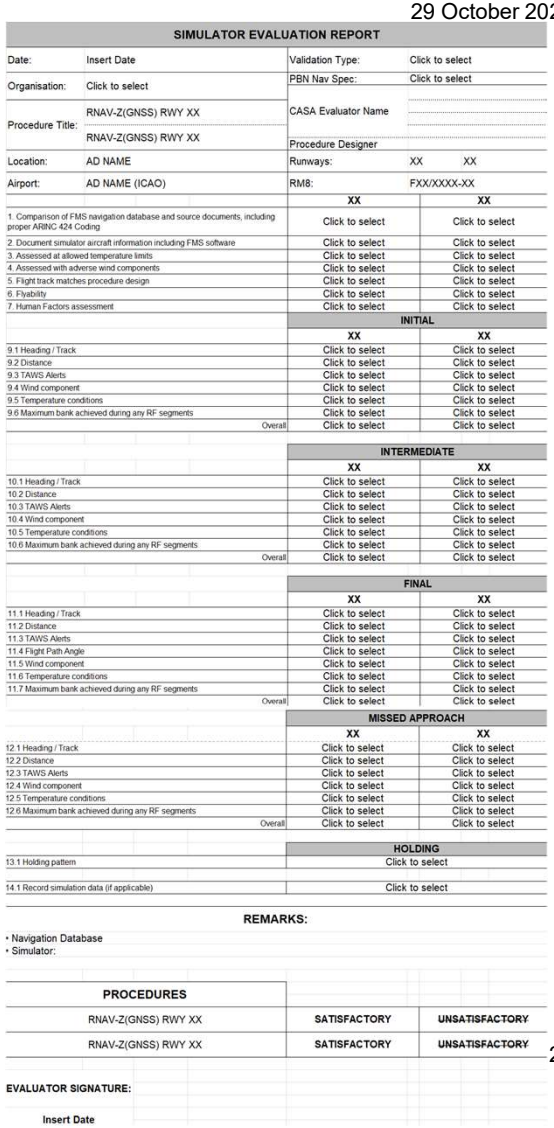
## Simulator validation:

- Conducted for LNAV/VNAV, RNP-AR & others as required, including arrivals and departures on a case-by-case basis. Evaluated at the desktop review stage.
- As required: Complex procedures (altitude and speed constraints, non-standard VPA), potential flyability concerns that may need simulator evaluation, e.g. RWY offset.
- Flyability issues discovered during on-site validation can be tested again in the aircraft simulator. E.g. IFP suitable for Category A/B aircraft may present challenges for faster aircraft.
- ICAO Doc 9906:
  - To assess flyability and human factors issues, at least one on-course/on-path assessment should be flown in an aircraft capable of conducting the procedure.
  - Custom navigation database for approaches with coded vertical paths.
  - Manual entry of data should be limited to LNAV procedures.
  - RNP AR IFPs must always undergo simulator evaluation.
- Publication of IFPs prior to validation to allow coding in the public navigation database for flight validation risks unauthorised public use of a procedure that may not be safe.

# IFP Validation

## Simulator validation:

- Conducted by CASA validation pilot and type-rated CASA Flying Operations Inspector.
- Simulator: Certified Level D approved for the procedure, valid TAWS and terrain database.
- Navigation database: Reviewed before validation.
- Procedure coding, tracks, flyability are checked (not necessary to validate these items again in the aircraft).
- Allows testing of different scenarios and adverse weather conditions (winds, temperatures etc.) and performance checks (climb, bank angle, ground proximity warnings, runway & slope alignment).



| SIMULATOR EVALUATION REPORT | | | |
|---|---|---|---|
| Date: | Insert Date | Validation Type: | Click to select |
| Organisation: | Click to select | PBN Nav Spec: | Click to select |
| Procedure Title: | RNAV-Z(GNSS) RWY XX | CASA Evaluator Name | |
| | RNAV-Z(GNSS) RWY XX | Procedure Designer | |
| Location: | AD NAME | Runways: | XX XX |
| Airport: | AD NAME (ICAO) | RMS: | FXX/XXXX-XX |

| | XX | XX |
|---|---|---|
| 1. Comparison of FMS navigation database and source documents, including proper ARINC 424 Coding | Click to select | Click to select |
| 2. Document simulator aircraft information including FMS software | Click to select | Click to select |
| 3. Assessed at allowed temperature limits | Click to select | Click to select |
| 4. Assessed with adverse wind components | Click to select | Click to select |
| 5. Flight track matches procedure design | Click to select | Click to select |
| 6. Flyability | Click to select | Click to select |
| 7. Human Factors assessment | Click to select | Click to select |
| **INITIAL** | | |
| | XX | XX |
| 9.1 Heading / Track | Click to select | Click to select |
| 9.2 Distance | Click to select | Click to select |
| 9.3 TAWS Alerts | Click to select | Click to select |
| 9.4 Wind component | Click to select | Click to select |
| 9.5 Temperature conditions | Click to select | Click to select |
| 9.6 Maximum bank achieved during any RF segments | Click to select | Click to select |
| Overall | Click to select | Click to select |
| **INTERMEDIATE** | | |
| | XX | XX |
| 10.1 Heading / Track | Click to select | Click to select |
| 10.2 Distance | Click to select | Click to select |
| 10.3 TAWS Alerts | Click to select | Click to select |
| 10.4 Wind component | Click to select | Click to select |
| 10.5 Temperature conditions | Click to select | Click to select |
| 10.6 Maximum bank achieved during any RF segments | Click to select | Click to select |
| Overall | Click to select | Click to select |
| **FINAL** | | |
| | XX | XX |
| 11.1 Heading / Track | Click to select | Click to select |
| 11.2 Distance | Click to select | Click to select |
| 11.3 TAWS Alerts | Click to select | Click to select |
| 11.4 Flight Path Angle | Click to select | Click to select |
| 11.5 Wind component | Click to select | Click to select |
| 11.6 Temperature conditions | Click to select | Click to select |
| 11.7 Maximum bank achieved during any RF segments | Click to select | Click to select |
| Overall | Click to select | Click to select |
| **MISSED APPROACH** | | |
| | XX | XX |
| 12.1 Heading / Track | Click to select | Click to select |
| 12.2 Distance | Click to select | Click to select |
| 12.3 TAWS Alerts | Click to select | Click to select |
| 12.4 Wind component | Click to select | Click to select |
| 12.5 Temperature conditions | Click to select | Click to select |
| 12.6 Maximum bank achieved during any RF segments | Click to select | Click to select |
| Overall | Click to select | Click to select |
| **HOLDING** | | |
| 13.1 Holding pattern | Click to select | |
| 14.1 Record simulation data (if applicable) | Click to select | |

**REMARKS:**

- Navigation Database
- Simulator:

| PROCEDURES | | |
|---|---|---|
| RNAV-Z(GNSS) RWY XX | SATISFACTORY | UNSATISFACTORY |
| RNAV-Z(GNSS) RWY XX | SATISFACTORY | UNSATISFACTORY |

**EVALUATOR SIGNATURE:**

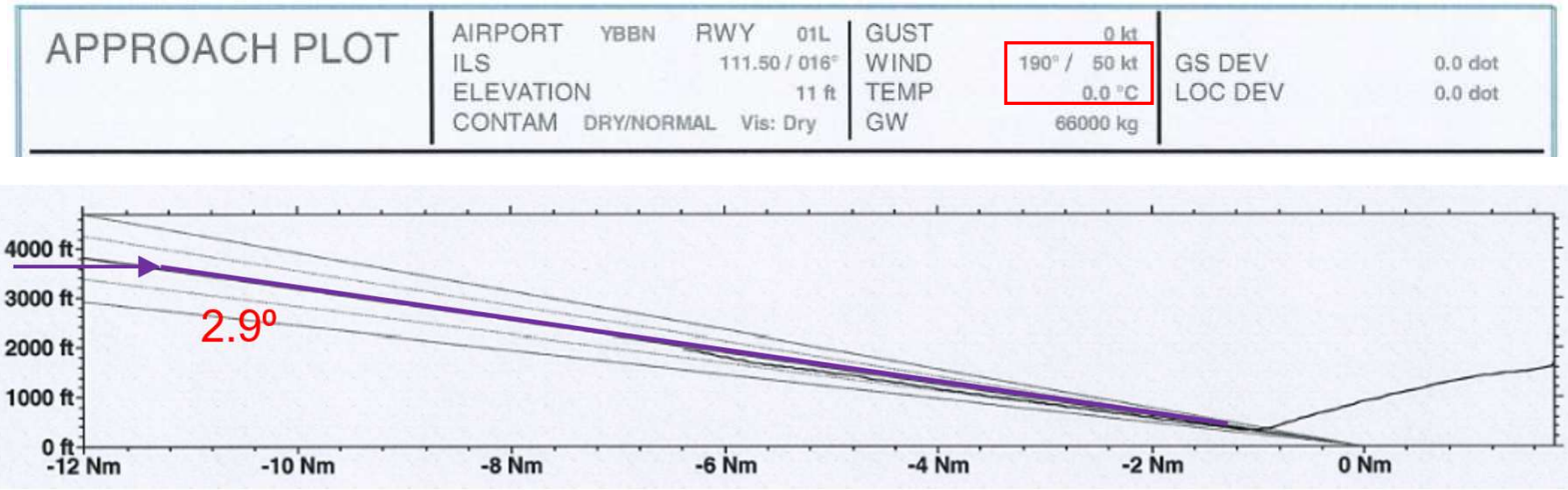
**Insert Date**

# IFP Validation

## Simulator validation:

- Vertical profile: Example

  Brisbane – YBBN 2.9º VPA, Temp limits 0°C to +59 °C



# IFP Validation

## Simulator validation:

Runway model for RW 01L

Runway model 19R

# IFP Validation

## On site flight validation:

- Conducted by CASA validation pilot, day VMC only.
- Specially equipped flight inspection aircraft not required.
- On site validation:
  - Critical navigational data such as runway ends validated (threshold coordinates)
  - Obstacles:
    - Verify identified controlling, charted & other obstacles (obstacle fly-by gross error check)
    - The edge of the protection areas can be accurately flown, helpful to accurately determine relevant obstacles, especially in built up areas or sloping terrain.
    - Vegetation allowance is suitable
    - Absence of obstacles extending through the floor of the MOCA (unforeseen obstacles)
    - No penetrations of FAS or missed approach surfaces (fly the surfaces using EFB contours)
    - Confirmation Visual Segment Surface (VSS) is not penetrated
  - Aerodrome facilities support procedure.
  - Local airspace arrangements – flyability/workload.

# IFP Validation

## On site flight validation:

Aircraft:

- Usually twin engine (Cessna Conquest/Beechcraft Baron)
- Helicopter where required
- Other aircraft when necessary, e.g. GLS-capability

Equipment and information:

- iPad (EFB)
- External GPS receiver, GPS tracker
- Go-Pro
- Maps/charts, Obstacle data

Crew:

- Validation pilot(s)
- Procedure designer – new procedures
- Trained observer

# IFP Validation

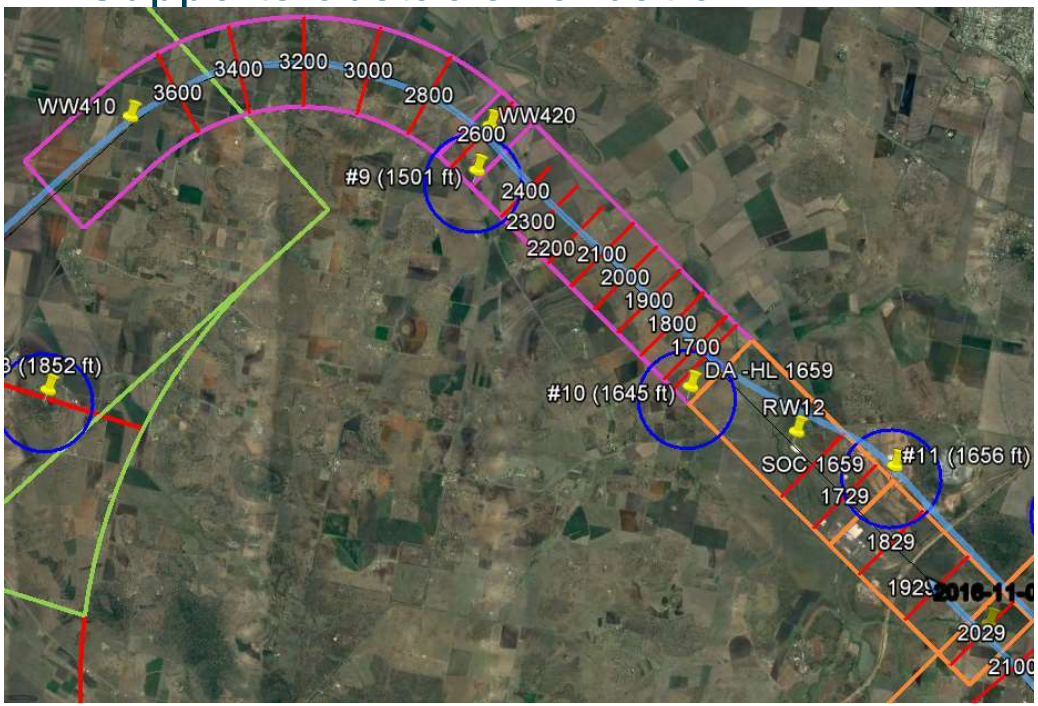
## On site flight validation: Equipment – iPad EFB Application

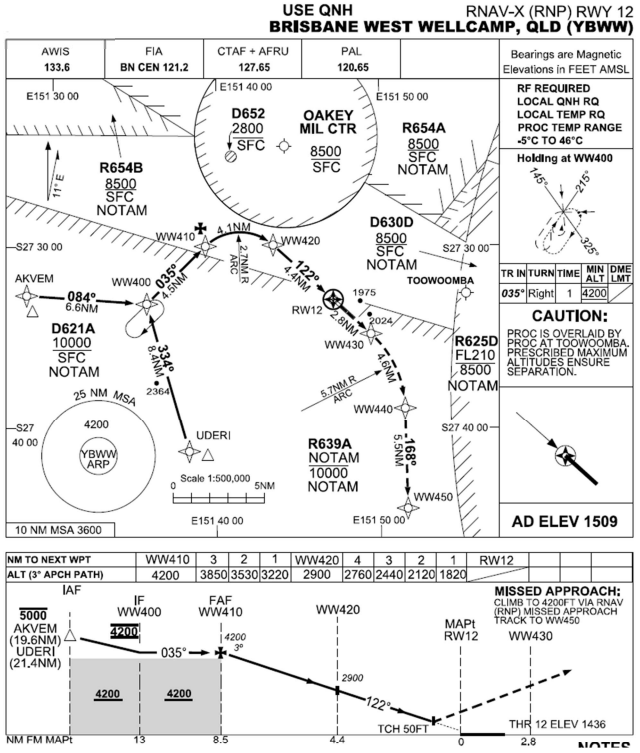
- CASR Part 175 (AIM) certified Data Service Provider – refer CASA website
- Access to current maps/charts
- Current GPS aircraft position
- PANS-OPS protection areas and obstacle surface overlays (e.g. kmz file)
- Obstacle and boundary overlays
- Different background maps
- Situational awareness – airspace boundaries, aircraft traffic
- Allows complex surfaces/turns to be efficiently assessed (including):
  - Baro-VNAV Final Approach Surface (FAS)
  - Missed approach surface
  - RF turns

# IFP Validation

## On site flight validation: Equipment – iPad EFB Application

- Supports obstacle validation



# IFP Validation

## On site flight validation:

Two passes conducted:

1. Check obstacle protection surfaces (fly the surfaces checking for penetrations by unknown obstacles)
2. Fly the procedure as published to confirm, flyability, lateral alignment with runway, and vertical alignment against PAPI.

# IFP Validation

## On site flight validation: Flight evaluation report completed

| FLIGHT EVALUATION REPORT | | | |
|---|---|---|---|
| Date: | Insert Date | Validation Type: | Click to select |
| Organisation: | Click to select | PBN Nav Spec: | Click to select |
| Procedure Title: | RNAV-Z(GNSS) RWY XX | CASA Evaluator Name | |
| | RNAV-Z(GNSS) RWY XX | Procedure Designer | |
| Location: | AD NAME | Runways: | XX XX |
| Airport: | AD NAME (ICAO) | RM8: | FXX/XXXX-XX |

| PLANNING | |
|---|---|
| | COMPLETED |
| 1.1 Check all necessary items from IFP package are available, to include: graphic, text, maps, submission form | Click to select |
| 1.2 Check all necessary flight validation forms are available | Click to select |
| 1.3 Appropriate aircraft and avionics for IFP being evaluated | Click to select |
| 1.4 Does the procedure require use of autopilot or flight director | Click to select |

| PREFLIGHT | |
|---|---|
| | COMPLETED |
| 2.1 Review Pre-Flight Validation assessment | Click to select |
| 2.2 Review Simulator Evaluation assessment (if applicable) | Click to select |
| 2.3 Obstacle assessment planning: areas of concern, ability to identify and fly lateral limits of obstacle assessment area (if req) | Click to select |
| 2.4 Verify source of IFP data for aircraft FMS (electronic or manual creation) | Click to select |
| 2.5 Evaluate navigation system status at time of flight (NOTAM, RAIM, outages) | Click to select |
| 2.6 Weather requirements | Click to select |
| 2.7 Night evaluation requirement (if applicable) | Click to select |
| 2.8 Required navigation (NAVAID) support (if applicable) | Click to select |
| 2.9 Combination of multiple IFP evaluations | Click to select |
| 2.10 Estimated flight time | Click to select |
| 2.11 Coordination (as required) with: ATS, Designer, Airport Authority | Click to select |
| 2.12 Necessary equipment and media for electronic record of validation flight | Click to select |
| 2.13 Press release arranged (if required), or NOTAM published | Click to select |

| GENERAL | | |
|---|---|---|
| | XX | XX |
| 3.1 IFP graphic (chart) is complete and correct | Click to select | Click to select |
| 3.2 Check for interference: document all details related to detected RFI | Click to select | Click to select |
| 3.3 Satisfactory radio comms (e.g. air traffic comms at IAF min alt, missed approach alt and holding fix) | Click to select | Click to select |
| 3.4 Required radar coverage is satisfactory | Click to select | Click to select |
| 3.5 Verify proper runway marking, lighting and VASIS/PAPI | Click to select | Click to select |
| 3.6 Threshold WDI | Click to select | Click to select |
| 3.7 Altimeter source(s) | Click to select | Click to select |
| 3.8 Other | Click to select | Click to select |

| OBSTACLE ASSESSMENT | | |
|---|---|---|
| | XX | XX |
| Verified controlling obstacle in each segment (inc circling and missed approach), if any obstacles are missing or any new obstacles are observed, record the lat/long | Click to select | Click to select |
| 4.1 Initial segment | Click to select | Click to select |
| 4.2 Intermediate Segment | Click to select | Click to select |
| 4.3 Final Segment | Click to select | Click to select |
| 4.4 Missed Approach | Click to select | Click to select |
| 4.5 Where necessary, fly the lateral limits of the obstacle assessment area. This is most appropriate for procedures designed in challenging terrain, or when there are questionable obstacles. Extra consideration should be given to non-surveyed areas. | Click to select | Click to select |
| 4.6 Holding | Click to select | Click to select |
| 4.7 MSA - 25NM | Click to select | Click to select |
| 4.8 MSA - 10NM | Click to select | Click to select |
| For approach procedures with circling minima, verify controlling obstacles for each circling category | | |
| 4.9 - Circling CAT A | Click to select | Click to select |
| 4.10 - Circling CAT A/B | Click to select | Click to select |
| 4.11 - Circling CAT C | Click to select | Click to select |
| 4.12 - Circling CAT D | Click to select | Click to select |
| 4.13 - VSS | Click to select | Click to select |

| FLYABILITY | | |
|---|---|---|
| | XX | XX |
| 5.1 Comparison of FMS navigation database and source documents, including proper ARINC 424 coding | Click to select | Click to select |
| 5.2 Human Factors and general workload satisfactory | Click to select | Click to select |
| 5.3 Note any loss of RAIM | Click to select | Click to select |
| 5.4 Note any loss of required RNP navigation performance | Click to select | Click to select |
| 5.5 Missed approach procedure | Click to select | Click to select |
| 5.6 Descent/Climb gradients | Click to select | Click to select |
| 5.7 Use of autopilot satisfactory | Click to select | Click to select |
| 5.8 Segment length, turns and bank angles, speed restrictions and decelerate allowance | Click to select | Click to select |
| 5.9 TAWS | Click to select | Click to select |

| INSTRUMENT APPROACH PROCEDURE | | |
|---|---|---|
| | XX | XX |
| 6.1 Segment lengths, heading/tracks and waypoints match proc design | Click to select | Click to select |
| 6.2 Final segment approach path angle | Click to select | Click to select |
| 6.3 Threshold crossing height (LTP or FTP), if applicable | Click to select | Click to select |
| 6.4 Course alignment | Click to select | Click to select |
| 6.5 FAS datablock, if applicable | Click to select | Click to select |
| 6.6 Threshold co-ordinates check | Click to select | Click to select |

| REMARKS: |
|---|
| <Insert remarks here> |

| PROCEDURES | | |
|---|---|---|
| RNAV-Z(GNSS) RWY XX | SATISFACTORY | ~~UNSATISFACTORY~~ |
| RNAV-Z(GNSS) RWY XX | SATISFACTORY | ~~UNSATISFACTORY~~ |

**EVALUATOR SIGNATURE:**

**Insert Date**

# IFP Validation

## Validation certification:

Post validation:

- Validation reports: Complete flight validation and simulator validation reports. Evaluate collected data and collate evaluation comments.
- Procedure designer: Update procedures where required.
- Procedure Validation Certificate: CASA approval to publish

# IFP Validation

## Regulator considerations & lessons learnt:

- Large/complex projects:
  - Likely have many staff & management changes, ensure agreements/sign-off at each stage.
  - Single point of contact at the Regulator to coordinate each different regulatory service team (Parts 139, 171, 172, 173, 175).
  - The aerodrome and ANSP should engage with the Regulator from the start, considering the evolving design.
- Data accuracy (DQRs): Confirm all survey data after construction/changes. Example case threshold coordinates were provided in GDA94 not in WGS84 (approx. 2m out).
- TAWS database currency: Alerts can occur if runway not in database, advise airlines for new runways.
- Avoid last minute IFP changes requiring complex NOTAMs and consider navigation data implications.

# IFP Validation

## Regulator considerations & lessons learnt (cont.):

- Procedure designers should coordinate with aerodrome operators to ensure IFP effective dates and significant runway changes occur at the same time.
- Thorough desktop review can identify corrections and reduce issues during simulator and flight validation saving costly revalidation.
- The procedure chart should clearly align with the recommended navigation data coding table, including presentation and coding of the vertical path.
- Consultation with data houses may be required for complex or non-standard procedure coding.
- For new validations, designer should participate ensuring designer has first-hand understanding of issues (they may be able to addressed them immediately). Further validation flights might not need to be conducted in this case.

# IFP Validation

## Regulator considerations & lessons learnt (cont.):

### Flyability:

IFPs may be PANS-OPS compliant however flyability issues may not be apparent until flown.

Factors include:

- Complex IFPs, using (multiple) height/speed restrictions, unclear instructions, steep approach, short/inconsistent segments. Stabilized approach criteria may be difficult to meet.
- Unconventional IFPs, so that aircraft standard operating procedures must be adapted.
- Airspace complexity, neighbouring aerodromes, controlled or restricted airspace which may affect pilot maneuvering whilst conducting the IFP, or present traffic separation challenges.
- Environment: not runway aligned, VSS penetrations, mountainous terrain (turbulence, altimetry issues) and TAWS.
- Runway infrastructure inadequate. For example: doesn’t support a straight-in IFP, visibility minima appropriate to the runway lighting facility.

# IFP Revalidation
## Overview:

- Conducted by CASA (contractor) every 5 years (MOS 173).
- Timing aligned with procedure designer periodic review and allows for updates/enhancements to be checked and validated where required at limited cost.
- Considers:
  - Obstacles: Limited vertical obstacle database. Individual aerodrome management.
  - Correct charting, waypoints and coding.
  - Airspace environment.
  - Aerodrome facilities.
  - Feedback provided to designer and aerodrome.
- Revalidation missions flown throughout the year, geographically grouped with all procedures checked over the five-year period.
- Procedure designer not required on-board.

# Summary

- Regulatory arrangements – set the standards to be met.
- Service provider certification – provides a baseline level of assurance of compliance.
- Service provider oversight – ensures ongoing safety and compliance.
- IFP validation – checks procedures are safe, compliant and flyable before use.
- IFP revalidation – ensures procedures remain safe, compliant and flyable.

# Oversight Workshop - Instrument Flight Procedures