Civil Aviation Safety Authority
of Papua New Guinea

Advisory Circular
AC173-4

Validation of Instrument Flight Procedure

Initial Issue

06 February 2025

GENERAL

Civil Aviation Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

PURPOSE

This Advisory Circular provides specific guidance acceptable to the Director, for showing compliance with Civil Aviation Rule 173 Validation Requirements of Instrument Flight Procedures requirements and explanatory material to assist in showing compliance.

RELATED CAR

This AC relates to Civil Aviation Rule Part 173, specifically rules:

- 173.205 Validation of Instrument Flight Procedures
- Appendix B — Acceptable Standards for design, maintenance and
- transfer of instrument flight procedures

CHANGE NOTICE

There was no previous issue of this AC, consequently no change is in effect.

APPROVAL

This AC has been approved for publication by the Director of Civil Aviation

Table of Content

1. General

The validation of Instrument Flight Procedures (IFP) is a critical process to ensure the safety and efficiency of flight operations. Here's an overview of the key steps involved:

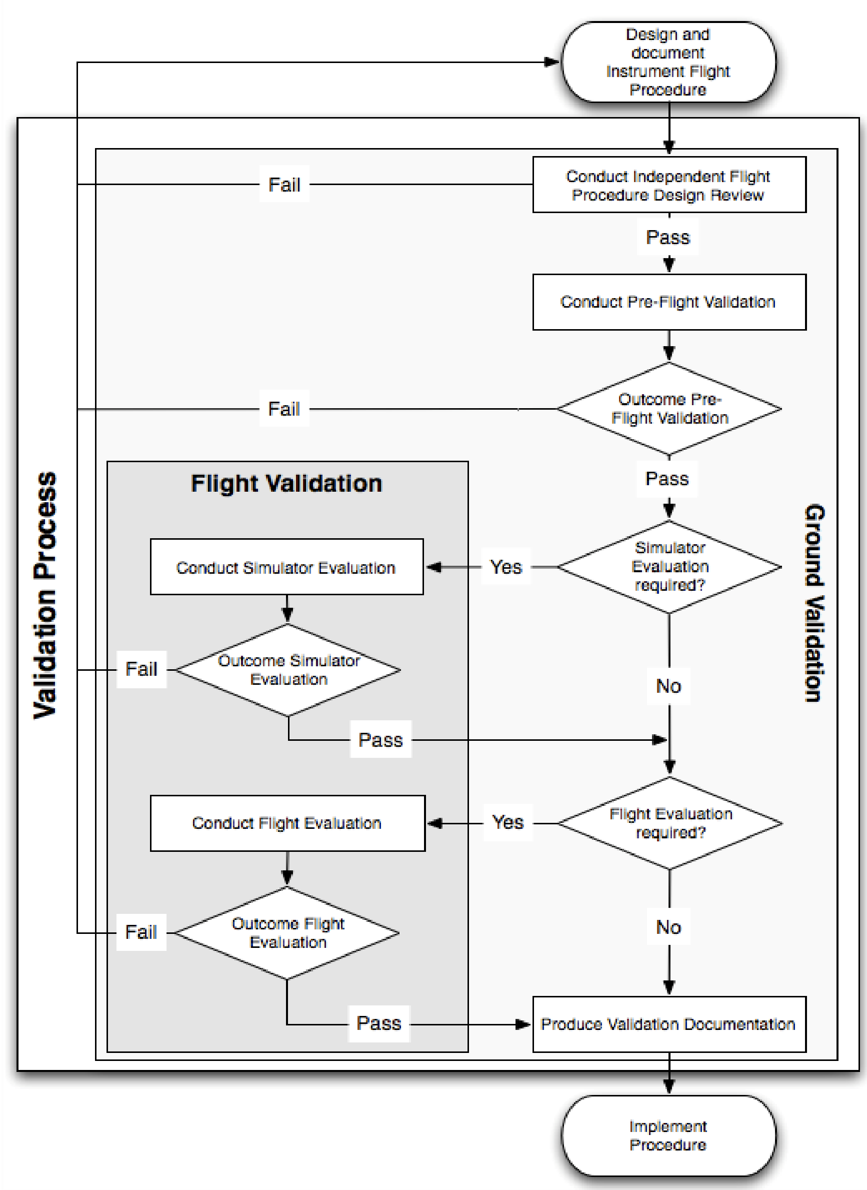


Figure 1: The validation of Instrument Flight Procedures (IFP) Process

1.1 **Ground Validation**: This initial phase involves a comprehensive review of the procedure design and associated data.

- **Obstacle Assessment**: Identifying and evaluating potential obstacles that could impact the flight path
- **Navigation Database Accuracy:** Ensuring that all navigation data is accurate and up-to-date.
- **Procedure Design Review**: Verifying that the procedure design meets all regulatory and safety standards.

1.2 Pre-Flight Validation: This phase includes simulator evaluations and further obstacle assessments.

- **Simulator Evaluation**: Testing the procedure in a flight simulator to identify any potential issues with fly ability and safety.
- **Airborne Obstacle Assessment**: Conducting an assessment of obstacles from the air to verify their impact on the procedure.
- **Air Traffic Environment Review**: Analysing the air traffic environment to ensure the procedure can be safely integrated into existing traffic flows.

1.3 Flight Validation: The final phase involves actual flight tests to verify the procedure's operational safety.

- **Obstacle Clearance Verification**: Ensuring that the procedure provides adequate clearance from obstacles.
- **Navigation Accuracy Check**: Verifying that the navigation aids and systems provide accurate guidance.
- **Flyability Assessment**: Confirming that the procedure can be safely flown under real-world conditions.
- **Infrastructure Verification**: Checking that all necessary infrastructure, such as communications and lighting, is in place and functioning correctly.

1.4 Additional Considerations

- **Documentation**: Throughout the validation process, detailed documentation is maintained to ensure traceability and compliance with regulatory requirements.
- **Regulatory Compliance**: The entire process must comply with rule 173.205 and ICAO Doc 8168 Vol II, Doc 9906 Vol 1.

The entire process is designed to confirm that the instrument flight procedures meet all operational requirements and are safe for use by pilots and air traffic controllers.

2. Subpart D — Design Criteria—Instrument Flight Procedure

EM 173.205 Validation of Instrument Flight Procedures

1. Ground Validation

- **Validation Elements**:
    - **Ground Validation**: This involves checking the procedure on the ground to ensure it meets all design criteria and safety standards. It includes reviewing charts, obstacle data, and ensuring compliance with regulatory requirements.
    - **Flight Validation**: May be required to verify the procedure in actual flight conditions. This step ensures that the procedure is flyable and safe.
    - **RNAV Procedures**: For RNAV (Area Navigation) procedures, a navigation database validation is also necessary to ensure the accuracy of the navigation data.
    - **Rule Reference**: 173.205(a)

- **Validation Plan:**
    - **Documentation**: All elements of the validation must be documented in a plan. This includes the methodology, tools, and criteria used for validation.

- **Submission:** This plan must be submitted to the Director for acceptance as early as possible. Early submission allows for any necessary adjustments based on feedback from the Director.
- **Rule Reference**: 173.205(b)

2. Pre-Flight Validation

- **Detailed Procedures:**
  - **Establish Procedures**: Detailed procedures for conducting the flight validation must be established as required by the Director. This includes defining the scope, objectives, and specific steps for the validation process.
  - **Rule Reference**: 173.205(c)
- **Qualified Pilots:**
  - **Experience and Qualification**: Flight validations must be performed by pilots who are qualified and experienced in flight validation. These pilots must have a thorough understanding of the procedure and the aircraft's capabilities.
  - **Rule Reference**: 173.205(d)
- **Aircraft Performance:**
  - **Appropriate Capabilities**: The aircraft used for flight validation must have the performance capabilities appropriate to the categories for which the IFP has been designed. This ensures that the aircraft can safely execute the procedure under various conditions.
  - **Rule Reference**: 173.205(e)

3. Flight Validation

- **Flight Conditions:**
  - **Daylight Hours**: All IFP validation flights must be conducted during daylight hours. This ensures better visibility and safety during the validation process.
  - **Visual Meteorological Conditions (VMC)**: Flights must be conducted in VMC to ensure safety and visibility. This allows the validating pilot to clearly observe and assess the procedure.
  - **Rule Reference**: 173.205(f)

4. Navigation Database Validation

- **RNAV Procedures:**
  - **Database Accuracy**: Navigation database validation is required for all RNAV instrument flight procedures to ensure the accuracy and reliability of the navigation data. This step verifies that the data used in the procedure is correct and up-to-date.
  - **Rule Reference**: 173.205(g)

5. Reporting

- **Completion of Reports:**
  - **Documentation**: After conducting ground, flight, and navigation database validations, a report must be completed by:
  - The instrument flight procedure approved designer.

- The validating pilot.
- The relevant Air Traffic Services (ATS) unit.
- **Submission**: These reports must be forwarded to the Director. The reports should detail the validation process, findings, and any issues encountered.
- **Rule Reference**: 173.205(h)

6. Unsatisfactory validation result

I). Identification of Issues:

- **Ground Validation**: If issues are found during ground validation, such as errors in the procedure design or inaccuracies in the navigation database, these must be corrected before proceeding to flight validation.
- **Pre-Flight Validation**: If pre-flight validation (including simulator evaluation and obstacle assessment) reveals problems, these must be addressed. This could involve redesigning parts of the procedure or reassessing obstacles.
- **Flight Validation**: If flight validation identifies issues with flyability, obstacle clearance, or other operational aspects, these must be resolved. This might require adjustments to the procedure or additional ground validation.

II). Corrective Actions:

- **Procedure Redesign**: The IFP may need to be redesigned to correct any identified issues. This could involve changes to the flight path, altitudes, or other procedural elements.
- **Revalidation**: After making necessary corrections, the procedure must undergo revalidation. This includes repeating ground, pre-flight, and flight validations as required.
- **Documentation and Reporting**: All findings and corrective actions must be documented. Updated validation reports must be submitted to the Director for review and acceptance.

III). Communication and Coordination:

- **Coordination with Relevant Authorities**: The validating organisation must coordinate with the relevant aviation authorities, such as the Director and Air Traffic Services (ATS) units, to ensure all issues are addressed and the procedure meets safety standards.
- **Notification of Stakeholders**: Relevant stakeholders, including pilots, airlines, and air traffic controllers, must be informed of any changes to the procedure and the reasons for those changes.

IV). Safety and Compliance:

- **Ensuring Safety**: The primary goal of addressing validation failures is to ensure the safety and reliability of the IFP. All corrective actions must be thoroughly tested and validated to meet regulatory standards.
- **Regulatory Compliance**: The procedure must comply with all applicable regulations and standards before it can be approved for operational use.

V). Continuous Monitoring:

- **Ongoing Monitoring**: Even after a procedure is validated and approved, it must be continuously monitored to ensure it remains safe and effective. Any new issues that arise must be promptly addressed.

EM Appendix C — Acceptable Standards for Validation of Instrument Flight Procedures

Instrument flight procedures must be validated in accordance with the standards and guidelines contained in the following ICAO Documents:

1. **Doc 8168 - PANS-OPS**:
   - Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS) provides comprehensive guidelines for the design and validation of instrument flight procedures.
2. **Doc 8071 - Volume 1 Chapter 8 and Volume II Chapter 5**:
   - This document covers the testing of radio navigation aids and includes specific chapters on the validation of instrument flight procedures.
3. **Doc 9274 – AN/904 Manual on the Use of the Collision Risk Model (CRM) for ILS Operations**:
   - This manual provides guidance on using the Collision Risk Model for Instrument Landing System (ILS) operations to ensure safety and compliance.
4. **Doc 9368 – AN/911 Instrument Flight Procedure Construction Manual**:
   - This manual offers detailed instructions on constructing instrument flight procedures, ensuring they meet safety and operational standards.
5. **Doc 9674 – AN/946 World Geodetic System 1984 (WGS-84) Manual**:
   - This document outlines the standards for using the World Geodetic System 1984 (WGS-84) in the design and validation of instrument flight procedures.
6. **Doc 9365 - Manual of All-Weather Operations**:
   - This manual provides guidelines for conducting flight operations in all weather conditions, ensuring procedures are safe and reliable.
7. **Doc 9613 – Performance-Based Navigation (PBN) Manual**:
   - This manual covers the principles and implementation of Performance-Based Navigation (PBN), which is essential for modern instrument flight procedures.
8. **Doc 9905 - Required Navigation Performance Authorization Required (RNP AR) Procedure Design Manual**:
   - This document provides guidelines for designing procedures that require specific navigation performance authorisation.

9. **Doc 9931 - Continuous Descent Operations (CDO) Manual**:
    - This manual offers guidance on implementing Continuous Descent Operations, which improve efficiency and reduce environmental impact.
10. **Doc 9906 - The Quality Assurance Manual for Flight Procedure Design Volumes 1 to 6**:
    - This comprehensive manual covers quality assurance in flight procedure design, including documentation, verification, validation methods, and training for flight procedure designers.

3. Validating Instrument Flight Procedure Design

3.1. Responsibilities During Flight Validation of Instrument Flight Procedures (IFPs)

3.1.1 IFP Designer

1. **Organization of Flight Validation Activities:**
    - Responsible for organizing and coordinating all aspects of the flight validation process.
    - Ensure all necessary preparations, including documentation and equipment, are in place for the validation flights.
2. **Design and Documentation**:
    - Create and document the IFPs according to regulatory standards.
    - Mark maps with final segment splays, missed approach segment splays, circling areas, and controlling obstacles.
3. **Review and Verification**:
    - Conduct an independent review of the IFP design to confirm criteria are applied correctly.
    - Address any deviations from the design criteria and ensure the accuracy of the draft charts.

3.1.2 Flight Validation Crew Member (Pilot)

1. **Planning Validation Flights**:
    - Develop detailed flight plans to validate the IFPs, considering factors such as weather, terrain, and air traffic.
    - Ensure all necessary documentation and equipment, including maps and charts, are prepared and available for the flight.
2. **Conducting Flight Validation**:
    - Fly the validation missions according to the planned procedures, ensuring all segments of the IFP are assessed.
    - Verify the accuracy of the procedure, including obstacle clearance, flyability, and navigation database accuracy.

3. **Coordination with Stakeholders**:
   - Work closely with the IFP designer, ATC, and other relevant stakeholders to ensure a coordinated and safe validation process.
   - Communicate any issues or discrepancies found during the validation flight to the IFP designer and other stakeholders.
4. **Documentation and Reporting**:
   - Document the findings of the validation flight, including any deviations or issues encountered.
   - Provide detailed reports to the regulatory authorities and other stakeholders involved in the validation process.
5. **Safety and Compliance**:
   - Ensure all validation activities comply with regulatory standards and safety protocols.
   - Conduct the validation flights in a manner that prioritizes the safety of the crew and the aircraft.

3.2. Maps and Charts

Ensure that the maps used are detailed and accurate enough for safe navigation.

1. **Topographical Map Requirements**:
   - **Scale**: At least 1:250,000 or larger. In areas with steep terrain or for specific segments, a scale of 1:100,000 may be necessary.
   - **Markings by Procedure Designer:**
     - Final segment splay/s
     - Missed approach segment splay/s
     - Circling area for appropriate categories or category groups
     - Controlling obstacles for each segment, Minimum Safe Altitude (MSA), and holding pattern.
2. **Electronic Flight Bags (EFBs)** can be used for validating instrument flight procedures. EFBs are capable of displaying electronic charts, performing complex calculations, and providing real-time data, which are essential for such validations.
   - **EFBs** can assist in this process:
     - **Chart Display**: EFBs can display detailed electronic charts for various flight procedures, including approach, departure, and enroute charts.
     - **Real-Time Data**: They can integrate with aircraft systems to provide real-time position data, which is crucial for validating the accuracy of instrument flight procedures.
     - **Calculations**: EFBs can perform necessary calculations for performance and navigation, ensuring that the procedures meet safety and regulatory standards.
   - Using EFBs can enhance the efficiency and accuracy of the validation process, reducing the reliance on paper charts and manual calculations.

3.3. Weather

1. **Daylight Hours**:
   - **Reason**: Conducting validation flights during daylight ensures better visibility for the flight crew. This is crucial for accurately assessing the terrain, obstacles, and other visual cues that are essential for validating instrument flight procedures.
2. **Visual Meteorological Conditions (VMC)**:
   - **Definition**: VMC refers to weather conditions that allow for visual navigation, meaning the flight crew can see and avoid obstacles and other aircraft.
   - **Reason**: Flying in VMC ensures that the flight crew can visually confirm the accuracy of the instrument flight procedures, including the location of waypoints, obstacles, and other critical elements.
3. **Ceiling Requirements**:
   - **Ceiling Above Initial Approach Altitude**: The cloud ceiling must be above the initial approach altitude to ensure that the flight crew can see the terrain and obstacles during the approach phase.
   - **Preferably Above the 25 NM Minimum Safe Altitude (MSA)**: Having the ceiling above the 25 NM MSA provides an additional safety margin, ensuring that the flight crew has ample visibility to assess the procedure accurately.

3.4. Aircraft Requirements for Flight Validation

The requirements stipulate that the aircraft and simulators employed for flight validation must be appropriate for the task at hand, thereby ensuring a safe and effective methodology for validating instrument flight procedures. The specific criteria are as follows:

1. **Performance Capabilities**
   - **Requirement**: The aircraft used for flight validation must have performance capabilities that are appropriate for the type and design of the procedure being validated.
   - **Reason**: Ensures the aircraft can safely and effectively execute the procedures under validation.
2. **Configuration**
   - **Requirement**: The aircraft must have a configuration that allows for good visibility and adequate cabin dimensions.
   - **Reason**: This ensures that maps and other documents can be easily referred to during the flight, facilitating accurate validation.
3. **Approval by CASA PNG Validation Pilot**
   - **Requirement**: The type of aircraft must be approved by the CASA PNG validation pilot.
   - **Reason**: Ensures that the aircraft meets regulatory standards and is suitable for the specific validation tasks.

4. **Use of Flight Simulators**
    - **Requirement**: An aircraft flight simulator, approved by the CASA PNG validation pilot, may be used to verify database information and the flyability of the procedure.
    - **Reason**: Simulators can provide a controlled environment to test and verify procedures, which can be more efficient and safer for certain aspects of validation.

3.5. Conduct of Operations

3.5.1. Crew Requirements for Flight Validation

1. **Minimum Crew**
    - **Requirement**: The minimum crew for flight validation consists of a pilot and an IFP designer.
    - **Oversight**: The validation process will be overseen by a CASA Flying Operations Inspector.
    - **Reason**: Ensures that the flight validation is conducted by qualified personnel with the necessary expertise, and that it is properly supervised for safety and compliance.
2. **Personnel on Board**
    - **Requirement**: Only persons directly involved in the validation procedure are to be carried in the aircraft.
    - **Reason**: Limits the number of people on board to those essential for the validation process, enhancing safety and focus during the flight.

3.5.2. Planning the Validation Flight

1. **Judgment in Planning:** Apply sound judgment to minimize time spent on task.
2. **Efficient Segments**: Link segments efficiently and avoid areas where obstacles do not affect the procedure.
3. **Objective**: Achieve an efficient validation process by focusing on relevant areas.

3.5.3. Crew Responsibilities

1. **Pilot**:
    - **Primary Role**: Fly the aircraft.
    - **Safety**: Ensure safe operation of the aircraft throughout the validation process.
2. **Procedure Designer**:
    - **Visual Navigation**: Navigate the aircraft visually.
    - **Direction**: Provide the pilot with tracks and altitudes to fly.
    - **Obstacle Noting**: Note any differences from the pre-determined list of obstacles.
3. **Both Crew Members**:
    - **Lookout**: Both are responsible for maintaining a lookout to ensure safety.
4. **Aircraft Configuration**:
    - **Emulate Highest Category**: Configure the aircraft to emulate the highest category for which the procedures are planned, especially important for short segments.

5. **Checking Obstacles**:
   - **Speed**: Use the highest practical speed, considering fuel reserves, when checking individual obstacles.
6. **Validation Process**:
   - **Gear and Lights**: Keep the gear up and turn on any lights that increase the visibility of the aircraft.

3.5.4. Environment

Before undertaking validation in populated or environmentally sensitive areas, the following measures are essential to ensure that validation flights are executed responsibly, taking into account environmental impacts and ensuring appropriate coordination with all pertinent stakeholders.

1. **Discuss Environmental Impact**:
   - **Action**: The procedure designer should discuss with the validation pilot any options for reducing the environmental impact of the flight.
   - **Reason**: To minimize the environmental footprint and ensure that the validation flight is conducted in an environmentally responsible manner.
2. **Advise Relevant Parties**:
   - **Action**: The procedure designer should advise the aerodrome operator, ATC, CASA office, and any other affected persons of the details of the proposed operation, including the requirement for low-level flying.
   - **Reason**: To ensure that all relevant parties are informed and can take necessary precautions or provide support as needed.
3. **Briefing to ATS Unit**:
   - **Action**: A briefing must be forwarded to the Officer in Charge of the responsible ATS Unit in advance of the flight checks.
   - **Timing**: There must be at least a full 24 hours between sending the briefing and conducting the flight checks. Prior notice should not be given more than seven (7) days in advance.
   - **Reason**: To ensure that the ATS Unit is adequately prepared and can coordinate the necessary air traffic management and safety measures.

3.5.5. Validation of the Procedure

1. **Sequence of Checks**
   - **Flexibility**: The sequence of checks is not mandated, allowing for the most economical arrangement based on the situation.
     - **Reason:** This flexibility helps in optimizing the validation process, making it more efficient and tailored to the specific conditions and requirements of each procedure.

2. **Specified Altitudes**

   - **Validation Altitudes**: The altitudes for validating an instrument approach segment are equal to the published segment minimum altitudes minus the Minimum Obstacle Clearance (MOC) for the segment.

     - **Example**: If the published segment minimum altitude is 3000 feet and the MOC is 500 feet, the validation altitude would be 2500 feet.
     - **Reason**: This ensures that the validation flight checks the procedure at altitudes that account for obstacle clearance, verifying that the procedure is safe and accurate.

3. **Checking Obstacles**

   - **Controlling Obstacles**: Each controlling obstacle and/or procedure segment must be checked at specified altitudes to validate obstacle data and identify any unforeseen obstacles.

     - **Process**: Fly the aircraft at the specified validation altitude over the procedure segment, observing and recording any obstacles that are encountered.
     - **Reason**: This step ensures that all obstacles that could affect the procedure are identified and accounted for, maintaining the safety and integrity of the flight path.

   - **Recording Unforeseen Obstacles**: If an unforeseen obstacle is observed, its location and height Above Mean Sea Level (AMSL) must be recorded for detailed analysis by the IFP designer.

     - **Process**: Note the exact position (latitude and longitude) and the observed height of the obstacle.
     - **Reason**: Detailed recording allows the IFP designer to analyze the obstacle and determine if it impacts the procedure, potentially leading to adjustments in the procedure design.

3.5.6. Minimum Sector Altitude (MSA) 25 and 10 NM

During Flight Validation, these processes ensure that the Minimum Sector Altitudes are fully validated, addressing all potential barriers and ensuring the procedures' safety and reliability.

3.5.7. Checking Sectors and Circles

1. **25** NM **and 10 NM Checks**: Each 25 NM sector or circle, and the 10 NM circle, must be checked at their specified altitudes.

   - **Coverage:** The 25 NM and 10 NM MSAs include obstacles out to 30 NM and 15 NM respectively from the navigation aid or Aerodrome Reference Point (ARP) upon which the MSA is based.

   - **Reason:** This ensures that all potential obstacles within the specified range are accounted for, maintaining the safety of the flight procedures.

2. **Controlling Obstacles**: Checks must include the controlling obstacle in addition to other obviously high terrain or obstacles.

  - **Process:** Fly the aircraft at the specified MSA altitude over the sector or circle, observing and recording any obstacles that are encountered.
  - **Reason:** Identifying and validating the controlling obstacles ensures that the procedure maintains adequate obstacle clearance.
3. **Judgment in Tracks**: Where the sector or circle does not exhibit greatly differing terrain elevations, judgment may be exercised regarding the tracks flown to provide full coverage of the area.
  - **Flexibility:** This allows for efficient validation by focusing on areas with significant terrain variations, ensuring that the entire area is adequately covered without unnecessary repetition.

3.6. DME/GPS Arrival Procedures

3.6.1. Checking Controlling Obstacles

1. **Determination by Procedure Designer:** The procedure designer identifies controlling obstacles for each segment within each sector of the arrival procedure.
  - **Reason**: Ensures that all potential obstacles that could impact the procedure are identified and accounted for.
2. **Checking at Specified Altitude:** These obstacles must be checked at the specified altitude.
  - **Process**: Fly the aircraft at the specified altitude over each segment, observing and recording any obstacles encountered.
  - **Reason**: Validates that the procedure maintains adequate obstacle clearance at the specified altitudes.
3. **Final and Intermediate Segments**:
  - **OIS Altitude**: Each step in the final and intermediate segments must be flown at the Obstacle Identification Surface (OIS) altitude.
  - **Radius of Step**: Each step must be flown around the radius of the step plus 1 NM, between the lateral limits of the sector splay.
  - **Reason**: Ensures that the procedure is checked comprehensively, accounting for all potential obstacles within the specified lateral limits.
4. **Checking During Flight**: The controlling obstacles for these steps can be checked during the process of flying the steps.
  - **Process**: As the aircraft flies each step, observe and record any obstacles that are encountered.
  - **Reason**: Provides real-time validation of the procedure, ensuring that all obstacles are accounted for and that the procedure is safe and reliable.

3.7. Circling Area

3.7.1. Checking the Circling Area for Lowest Supported Aircraft Category

- **Procedure**: Fly around the lateral limit of the circling area for the lowest supported aircraft category or group (usually CAT A/B) at the specified altitude for that category.
- **Observation**: Look in towards the airfield to identify both the controlling obstacle and any unforeseen obstacles.
- **Reason**: This method allows for a comprehensive check of obstacles that could affect the circling procedure for the lowest category aircraft.

3.7.2. Checking for Higher Supported Aircraft Categories

- **Procedure**: Repeat the same process for the next highest supported aircraft category or group (CAT C/D).
- **Inner Check First**: By conducting the inner check first, obstacles that may affect all categories can be readily identified.
- **Reason**: Ensures that the circling area is safe for all supported aircraft categories by identifying obstacles that could impact any category.

3.7.3. No Circling Areas

- **Exclusion**: Circling area checks are not conducted in areas designated 'No Circling'.
- **Reason**: These areas are excluded from circling procedures due to safety or operational constraints.

3.8. Final and Intermediate Segments

3.8.1. Checking the Final and Intermediate Segments

1. **Initial Check from MAPT:**
    - **Procedure**: Fly from overhead the Missed Approach Point (MAPT) at the specified altitude for the final segment, at 90° to the final track, to the limit of the splay.
    - **Reason**: This ensures that the final segment is thoroughly checked for any obstacles and that the procedure is safe and accurate.
2. **Turn and Fly Along Lateral Edge:**
    - **Procedure**: Turn to fly away from the airfield along the lateral edge of the splay at the final specified altitude to abeam the step down fix (if implemented) or abeam the Final Approach Fix (FAF).

        I). **Abeam the Step Down Fix**: Climb to the specified altitude for the next section of the final segment.

        II). **Terminate Abeam the FAF**: Unless an intermediate segment is implemented, in which case continue along the lateral limit of the intermediate segment at the intermediate specified altitude until abeam the Initial Fix (IF) and terminate at that point.

        III). **Identify Obstacles**: During this process, look across the splay to identify the controlling obstacle and any unforeseen obstacles.

- **Reason**: This step-by-step approach ensures that all segments of the procedure are checked for obstacles, maintaining the safety and reliability of the procedure.

3. **Repeat on Opposite Side:**
    - **Procedure**: Conduct the same process on the opposite side of the splay, but looking in the opposite direction.
    - **Reason**: Ensures that both sides of the splay are thoroughly checked for obstacles, providing a comprehensive validation of the procedure.
4. **Shortened Procedure:**
    - **Procedure**: If the terrain and visibility allow for an unobstructed view from one side of the splay to the other, the procedure can be shortened by flying along the centerline of the splay at the appropriate specified altitude.
    - **Reason**: This allows for a more efficient validation process while still ensuring that all obstacles are identified and accounted for.

3.9. Missed Approach Segment

3.9.1. Checking the Missed Approach Segment

1. **Positioning the Aircraft:**
    - **Procedure**: Position the aircraft at the start of climb point, determined at the specified level.
        - Navigate the aircraft to the start of climb point using the specified navigation aids or waypoints.
        - Ensure the aircraft is at the correct altitude (specified level) as indicated in the procedure.
        - ***Example:*** *If the start of climb point is at a waypoint "XYZ" at 2000 feet, the aircraft should be navigated to waypoint "XYZ" and positioned at 2000 feet.*
    - **Reason**: Ensures that the aircraft is correctly positioned to begin the missed approach procedure, maintaining accuracy and safety.
2. **Flying the Missed Approach Track:**
    - **Procedure**: Fly the aircraft along the missed approach track, climbing at a rate that equates to the missed approach design gradient, until in the final phase of the missed approach.
    - **Reason**: This ensures that the aircraft follows the designed missed approach path, maintaining obstacle clearance and procedural integrity.

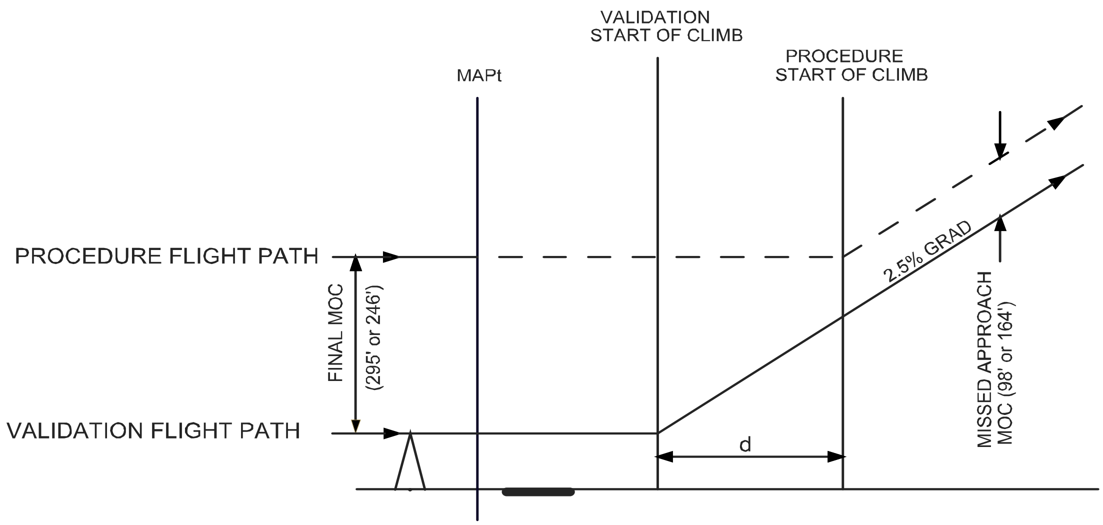
3.9.2. Checking in Environments with Numerous Obstacles

Procedure:

- **Missed Approach Splays**: For environments with numerous obstacles, the missed approach segment should be checked by flying the missed approach splays in a similar manner to that specified for the final and intermediate segments.

- **Climbing Along Lateral Edge**: Climb along the lateral edge of the splay, in accordance with the missed approach design gradient, until in the final phase of the missed approach.
- **Reason**: This method ensures that all potential obstacles are identified and accounted for, maintaining the safety and reliability of the missed approach procedure.

The validation start of climb must be determined in accordance with ***Figure 2***;



$$d = \frac{\text{Final MOC - Missed Approach MOC}}{0.025}$$

Figure 2: Validation start of climb

Linking the Final and Missed Approach Segments ***Figure 3*** shows a method for linking the checks of the final and missed approach segments.

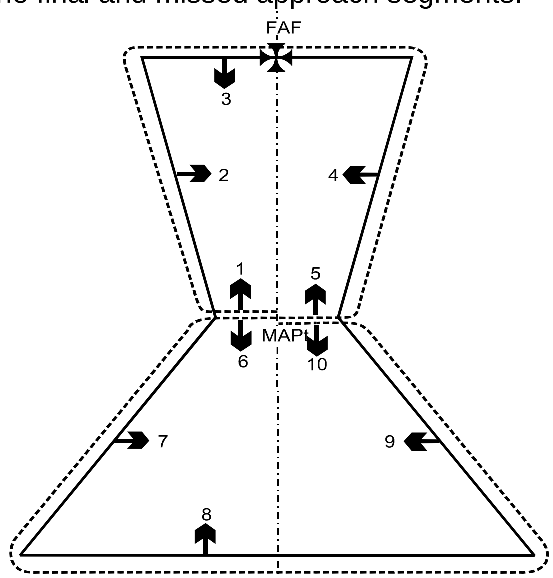


Figure 3: Final and missed approach segments

3.10. Holding and Initial Segments

3.10.1. Checking Controlling Obstacles

1. **Controlling Obstacles:** The controlling obstacles for the holding and initial segments must be checked at their specified altitude.
   - **Reason**: Ensures that the procedure maintains adequate obstacle clearance and that all potential obstacles are accounted for.
   - **Process**: Fly the aircraft at the specified altitude over the holding and initial segments, observing and recording any obstacles encountered.
2. **Identifying Unforeseen Obstacles**: Any unforeseen obstacles must be identified during these checks.
   - **Reason**: Identifying unforeseen obstacles ensures that the procedure is safe and that any new obstacles are accounted for in the procedure design.
   - **Process**: Note the exact position (latitude and longitude) and the observed height of any unforeseen obstacles.
3. **Combining Checks**: These checks may be combined with the checks of the DME/GPS Arrival Procedure.
   - **Reason**: Combining checks can make the validation process more efficient by addressing multiple segments and procedures in a single flight.
   - **Process**: Plan the flight to cover both the holding and initial segments as well as the DME/GPS arrival procedure, ensuring that all relevant obstacles are checked.

3.11 Windsocks

3.11.1 Visibility Requirement

These requirements ensure that pilots have a clear indication of wind direction and speed during runway-aligned approaches, enhancing safety and operational efficiency.

- **Requirement**: For runway-aligned approaches where a windsock is not located adjacent to the runway threshold, it must be confirmed that a windsock is visible when the aircraft is at the Minimum Descent Altitude (MDA).
- **Regulation**: This must be in accordance with Part 139 - Appendix E — Visual Aids for Navigation.

3.11.2 Part 139 - Appendix E — Visual Aids for Navigation

- **Wind Direction Indicators**: An aerodrome must be equipped with at least one wind direction indicator (windsock) that is visible from aircraft in flight or on the movement area.
- **Location and Visibility**: The windsock should be located to be free from the effects of air disturbances caused by nearby objects and should be clearly visible from a height of at least 300 meters.
- **Characteristics**: The windsock should be in the form of a truncated cone made of fabric, with specific dimensions and colors to ensure visibility and understandability.

3.12 Traffic

3.12.1 Priority to Other Traffic

By giving priority to other traffic, the validation process can be conducted safely without disrupting the normal flow of air traffic.

- **Requirement:** When validation requirements conflict with existing traffic patterns, priority must be given to other traffic.
- **Reason:** Ensures the safety and efficiency of air traffic operations by preventing disruptions and maintaining orderly traffic flow.
- **Implementation:**
  - **Coordination with ATC**: Work closely with Air Traffic Control (ATC) to manage and coordinate validation flights in a way that minimizes conflicts with regular traffic.
  - **Flexible Scheduling**: Plan validation flights during periods of lower traffic density if possible, to reduce the likelihood of conflicts.
  - **Real-Time Adjustments**: Be prepared to make real-time adjustments to the validation flight plan if necessary to accommodate other traffic.

3.13 Flight Safety

Some of these checks will be conducted close to obstacles and in close proximity to airfields, therefore a visual-and-listening watch by all crewmembers is essential. In particular, the following points should be noted:

3.13.1 Airspeed Monitoring:

- **Importance**: Maintaining the correct airspeed is crucial, especially during maneuvers with high angles of bank. High bank angles can increase the risk of stalling if the airspeed drops too low.
- **Best Practices**: Regularly check your airspeed indicator and be aware of the aircraft's performance limits. Use smooth and coordinated control inputs to maintain a safe airspeed.

3.13.2 Obstacle Awareness:

- **Inconspicuous Towers and Power Lines**: These can be difficult to spot, especially if they are painted in low-contrast colors that blend with the surroundings.
- **Best Practices**: Conduct thorough pre-flight planning to identify potential obstacles along your route. Use updated charts and navigation aids. During flight, maintain a vigilant lookout and use all available resources, including crew members, to spot and avoid obstacles.

3.13.3 Bird Hazards:

- **Risks**: Birds can pose a significant threat to aircraft, particularly during takeoff and landing phases. Bird strikes can cause serious damage to engines and airframes.
- **Best Practices**: Be especially cautious near areas where birds are likely to be present, such as near bushfire smoke, mountainous regions, and bodies of water. Use bird detection systems if available and follow recommended procedures for avoiding bird strikes.

3.14 Reporting

3.14.1 Flight Validation Report Form

- **Requirement**: A flight validation report form, prepared for the applicable aerodrome, must be attached as part of the validation flight request package.
- **Standard Format**: The standard report format is shown in **Appendix A.**
- **Reason**: Ensures that all necessary information is documented and submitted as part of the **validation** process.

3.14.2 Post-Flight Reporting

1. **Pilot's Responsibility**:
    - **Complete the Validation Report**: Following the completion of the validation flight, the pilot must complete the validation report.
    - **Reason**: The pilot's firsthand observations and data are crucial for accurately documenting the validation flight.
2. **Procedure Designer's Responsibility:**
    - **Process the Report Form**: The procedure designer must process the report form.
    - **Complete Follow-Up Action**: The procedure designer must also complete any follow-up actions based on the findings of the validation flight.
    - **Reason**: Ensures that any issues identified during the validation flight are addressed and that the procedure is finalized and ready for publication.
3. **Additional Documentation:**
    - **Consultation Record**: Agreement from aircraft operators for new procedures, with a two-week comment period.
    - **ATS Approval**: Written approval for procedures involving CTR and/or TMA airspace.
    - **Navaid Documentation**: Specifications, flight test documentation, and evidence of Commissioning Certificate action for procedures based on new navaids.

4. APPENDIX A - IFP VALIDATION TEMPLATES

- The following sample checklist and report templates contain minimum suggested data and information required to be recorded during the validation process. If certain items are not applicable to the intended IAP, identify the boxes in the form by strikethrough or the term "n/a". Such forms must be signed.
- The templates may be customized as applicable to the type of IFP to be validated as required.

A01 IFP Ground Validation Checklist

Date		**Procedure ☐ New or ☐ Amended**	
Location of Check		**Navigation Sensor/Navaid**	
Aerodrome		**PBN Nav Specs**	
RWY/Landing Location ID		**Evaluator Name**	
		Signature	
		Phone Contacts	
		Email	

	CHECKLIST ITEM	CHKD	ACTION/COMMENTS
1.1.	IFP Package: Forms, Charts, Maps		
1.2.	Intended Use & Special Requirements		
	Base Data Verification: *Aerodrome/heliport (AD/HP), lighting & other infrastructure, MagDev, QNH, Comms), Aeronautical (RWY, THRs LTPs, DERs, etc., Navaids, airspace including PRDs, airways & routes, fixes), obstacle, ARINC coding)*		
1.3.	Procedure type: *Classification (include weather PBN or not) – correct & appropriate*		
1.4.	Specific ground navaid &/or approach facilities support required: *Specified, other issues noted (e.g., ESV(extra service volume) requirements, minimum DME coverage, etc, &/or new lighting, modified PAP Is, etc)*		
1.5.	Procedure Data Verification: *Aircraft categories, waypoints/fixes &/or navaids, bearing, leg lengths, MSDs, MOCAs, minima, altitudes, descent & climb gradient, speeds*		
1.6.	Regulations & SARPs: ICAO document, State Implementations		
1.7.	Non-Standard Criteria: *Temp, wind, speeds, mountainous terrain, noise, etc Consider impact on the procedure of waivers to standard design criteria*		
1.8.	Design caters for performance & operational constraints *Adequately caters for minimum leg lengths, turns and with regards to gradient, allows for deceleration/acceleration and configuration, airspace & ATM issues, etc*		
1.9.	Safety Assessment		
1.10.	Procedure Coding Data Verification:		

	CHECKLIST ITEM	CHKD	ACTION/COMMENTS
	Procedure descriptor &/or AR INC coding		
1.11.	Chart Notes: *Low and/or high temperature limits, speeds, missed approach, other airspace uses not subject to PRDs (eg, gliding, ultralights) additional navaid requirements, local/remote QNH, comms failure and RAIM alert procedures*		
1.12.	Overall design is appropriate: *Practical, complete, satisfies intended use & requirements and has appropriate levels of safety (including mitigations where relevant)*		
1.13.	Other (specify):		
1.14.	Subject to Simulator Evaluation?		
1.15.	Subject to Flight Evaluation?		
1.16.	Procedure		

A02 IFP Simulator Evaluation Checklist

SIMULATOR DETAILS			
Test date /No		**Simulator Site**	
FMS type model		**FMS software/ Release or verification**	
GPWS/ EGPWS DB		**Additional details**	
SIM Operator		**Contact details**	

Date		**Procedure ☐ New or ☐ Amended**	
Location of Check		**Navigation Sensor/Navaid**	
Aerodrome		**PBN Nav Specs**	
RWY/Landing Location ID		**Evaluator Name**	
		Signature	
		Phone Contacts	
		Email	

CHECKLIST ITEM		CHKD	ACTION/COMMENTS
1.1.	Comparison of FMS navigation database and source documents, including proper ARINC 424 Coding		
1.2.	Document simulator aircraft information including FMS software		
1.3.	Assessed faster and/or slower than charted		
1.4.	Assessed at allowed temperature limits-Minimum		
1.5.	Assessed at allowed temperature limits-Maximum		
1.6.	Assessed with adverse wind components		
1.7.	Flight track matches tracks depicted on IFP Chart		
1.8.	Flyability		
1.9.	Human Factors assessment (CRM) Flight Deck Workload		

CHECKLIST ITEM		CHKD	ACTION/COMMENTS
	IFP SEGMENT – SIMULATOR VALIDATION		
2.	**INITIAL APPROACH SEGMENT**		
2. 2.1.	Heading/Track		
2.2.	Distance		
2.3.	Wind Component		
2.4.	Temperature Conditions		
2.5.	Maximum bank angle achieved during any RF leg segments (if applicable)		
2.6.	Obstacle Assessment		
2.7.	GPWS/EGPWS Alerts		
3.	**FINAL APPROACH SEGMENT**		
3. 3.1.	Heading/Track		
3.2.	Distance		
3.3.	Wind Component		
3.4.	Temperature Conditions		
3.5.	Maximum bank angle achieved during any RF leg segments (if applicable)		
3.6.	Obstacle Assessment		
3.7.	GPWS/EGPWS Alerts		
4.	**MISSED APPROACH SEGMENT**		
4. 4.1.	Heading/Track		
4.2.	Distance		
4.3.	Wind Component		
4.4.	Temperature Conditions		
4.5.	Maximum bank angle achieved during any RF leg segments (if applicable)		
4.6.	Obstacle Assessment		
4.7.	GPWS/EGPWS Alerts		
5.	**SID**		
5. 5.1.	Heading/Track		
5.2.	Distance		
5.3.	Wind Component		
5.4.	Temperature Conditions		
5.5.	Maximum bank angle achieved during any turn		
5.6.	Obstacle Assessment		
5.7.	GPWS/EGPWS Alerts		
6.	**STAR**		
5.8.	Heading/Track		
5.9.	Distance		
5.10.	Wind Component		
5.11.	Temperature Conditions		
5.12.	Maximum bank angle achieved during any turn		
5.13.	Obstacle Assessment		

CHECKLIST ITEM		CHKD	ACTION/COMMENTS
5.14.	GPWS/EGPWS Alerts		
7.	Record simulation data (if applicable)		

A03. IFP Flight Validation Planning and Pre-Flight Checklist

Date		**Procedure ☐ New or ☐ Amended**	
Location of Check		**Navigation Sensor/Navaid**	
Aerodrome		**PBN Nav Specs**	
RWY/Landing Location ID		**Evaluator Name**	
		Signature	
		Phone Contacts	
		Email	

	CHECKLIST ITEM	CHKD	ACTION/COMMENTS
1.	**PLANNING**		
1.1.	Approval to conduct to Flight Validation		
1.2.	Have all necessary items from IFP package, including: Graphics, text, maps, submission form		
1.3.	Necessary flight validation forms		
1.4.	Any Flight Inspection requirements identified • Ground Navaid • Lighting • Other landing aids/facilities		
1.5.	Obstacle assessment planning: *Areas of concern, ability to identify and fly lateral limits of obstacle assessment area (if required) etc*		
1.6.	Detailed flight evaluation planning: *Eg, routing, vertical paths, evaluating MOCAs, lateral containments, turns, critical obstacles, treatment of previously unidentified obstacles, etc*		
1.7.	Contingency planning *Navigation outages or signal interference, IMC, comms failure, etc*		
1.8.	Appropriate aircraft and avionics for IFP being evaluated		
1.9.	Appropriate recording and logging facilities & tools		
1.10.	Personnel		
1.11.	Planning with airport & ATM service provider		
1.12.	Preliminary flight plan		
1.13.	Other (specify):		
1.	**PRE-FLIGHT**		
2. 2.1.	Review Ground Validation assessment		
2.2.	Review Simulator Evaluation assessment (if applicable)		

	CHECKLIST ITEM	CHKD	ACTION/COMMENTS
2.3.	Review Obstacle Assessment & Flight Evaluation Strategy Plans		
2.4.	Verify source of IFP data for aircraft FMS (electronic or manual creation)		
2.5.	Required Navigation (navaid) support (if applicable)		
2.6.	Other Flight Inspection activities (eg, VASIS, PAPIs) requirements (if applicable)		
2.7.	Weather requirements		
2.8.	Night evaluation requirements (if applicable)		
2.9.	Combination of multiple IFP evaluations		
2.10.	Brief contingency actions		
2.11.	Estimate Flight times, alternative(s) & fuel		
2.12.	Flight Plan submitted		
2.13.	Coordination (as required) with: ATC, IFPD organisation, Airports & CASA PNG		
2.14.	Necessary equipment and media for electronic record of validation flight		
2.15.	Evaluate navigation system status at time of flight (NOTAM, RAIM, outages)		
2.16.	Flight and ground equipment calibrated		
2.17.	Review Pilot, IFPD representatives, Technical and observer responsibilities and as required, inflight coordination		
2.18.	Other (specify):		

A04. IFP In-Flight Validation Checklist

FLIGHT VALIDATION EVALUATION DETAILS			
Test date /No		**ACFT type & Tail No**	
FMS type model		**FMS software/ Release or verification**	
GPWS/ EGPWS DB		**Additional details**	
PIC		**Contact details**	
FO		**Contact details**	

Date		**Procedure ☐ New or ☐ Amended**	
Location of Check		**Navigation Sensor/Navaid**	
Aerodrome		**PBN Nav Specs**	
RWY/Landing Location ID		**Evaluator Name Signature**	
		Phone Contacts	
		Email	

	PARAMETERS	SATISFACTORY	COMMENTS
1.	**HOLDING PROCEDURE**		
	Inbound Course/Track	☐ YES ☐ NO	
	Minimum Holding Altitude		
2.	**Procedure Outbound (Initial and Intermediate Approach Segment)**		
	Outbound Course/Track	☐ YES ☐ NO	
	Rate of Descent	☐ YES ☐ NO	
	Turn Altitude	☐ YES ☐ NO	
	Outbound Distance	☐ YES ☐ NO	
	Maximum Distance in Turn	☐ YES ☐ NO	
	TAWS Alert	☐ YES ☐ NO	
	Critical obstacles	☐ YES ☐ NO	
	Segment length, turns and bank angles, speed restrictions	☐ YES ☐ NO	
3.	**Procedure Inbound (Final Approach Segment)**		
6.	Interception of Inbound Course/Final Approach Track/Localiser	☐ YES ☐ NO	
	Flight path angle	☐ YES ☐ NO	
	Rate of Descent	☐ YES ☐ NO	
	TAWS Alert		
	Critical obstacles		
	Straight-In Approach	☐ YES ☐ NO	
	Fix crossing altitudes	☐ YES ☐ NO	
	OCA(H), MDA(H), DA(H) as relevant to Touchdown (Visual Segment)	☐ YES ☐ NO	
	Threshold Crossing Height (LTP or FTP, if applicable)	☐ YES ☐ NO	
4.	**Missed Approach Segment**		
7.	MAPt location	☐ YES ☐ NO	
	Missed approach climb gradients	☐ YES ☐ NO	
	TAWS Alert	☐ YES ☐ NO	
	Critical obstacles	☐ YES ☐ NO	
	Missed approached design/instructions (if applicable)	☐ YES ☐ NO	
5.	**Visual Aids**		
8.	Performance of Visual Aids (PAPI/VASIS)	☐ YES ☐ NO	
	Approach Light System	☐ YES ☐ NO	
	Wind Direction Indicators	☐ YES ☐ NO	
6.	**Overall**		
	Flyability	☐ YES ☐ NO	
	Human Factors assessment (CRM) Flight Deck Workload	☐ YES ☐ NO	
	Approach and associated charts assessment	☐ YES ☐ NO	
	Recommendations;		

	PARAMETERS	SATISFACTORY	COMMENTS

UNIDENTIFIED OBSTACLES			
DESCRIPTION	APPROXIMATE ELEVATION	LOCATION & IAP SEGMENTS	OWNER (if known)