



Australian Government

Department of Education, Employment and Workplace Relations

AVIH5017A Navigate aircraft - IFR

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

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This unit involves the skills and knowledge required to navigate an aircraft under Instrument Flight Rules (IFR) excluding instrument approaches. Licensing, legislative, regulatory or certification requirements are applicable to this unit.

Application of the Unit

Application of the Unit

Work must be carried out in compliance with the relevant licence and aircraft rating requirements of the Civil Aviation Safety Authority (CASA); relevant airspace control requirements and Instrument Flight Rules (IFR); and aircraft control principles, regulations, safety codes, protocols and procedures relevant to navigate aircraft - IFR as part of commercial aircraft activities.

Use for ADF Aviation is to be in accordance with relevant Defence Orders and Instructions and applicable CASA compliance.

Operations are conducted across a variety of operational contexts within the Australian aviation industry.

Work is performed under limited supervision.

This unit of competency is packaged at AQF V.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability Skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Select, operate and monitor navigation aids/systems	<p>1.1 Appropriate navigation aids/systems for the planned IFR flight are selected and operated in accordance navigation aid/system requirements</p> <p>1.2 Integrity of navigation aid/systems information is monitored and maintained</p>
2 Navigate the aircraft in IMC/simulated IMC	<p>2.1 Aircraft position fix is determined solely with reference to navigation aid/system</p> <p>2.2 Tracks are intercepted to and from navigation aids/systems</p> <p>2.3 Track is maintained within tolerances specified in AIP</p> <p>2.4 Timings are recorded, assessed and revised as required</p> <p>2.5 Station passage is recognised</p> <p>2.6 GPS/DME arc procedure is performed within tolerances specified in AIP if applicable</p> <p>2.7 Planned route above Lowest Safe Altitude (LSALT) is maintained in accordance with IFR</p> <p>2.8 IMC to visual flight transition is performed before descending below the lesser of LSALT/MSA</p> <p>2.9 Route and destination weather conditions are monitored and appropriate actions are executed</p> <p>2.10 Descent point is calculated and/or amended</p>
3 Conduct a diversion to revised route or alternate aerodrome	<p>3.1 Requirement for an unplanned diversion is recognised and confirmed</p> <p>3.2 Route to alternate aerodrome, navigation aid and /or revised track is determined</p> <p>3.3 Planned route maintains height above LSALT in accordance with regulations while flying under IFR</p> <p>3.4 Flight planned route is diverted to track to alternate aerodrome, navigation aid and/or aerodrome</p> <p>3.5 Operational information for alternate aerodrome/s is reviewed and applied according to regulations and/or operator procedures</p> <p>3.6 Fuel plan is reviewed and amended according to regulations and/or operator procedures</p>
4 Conduct holding pattern in IMC	<p>4.1 Holding pattern is entered at or above LSALT/MSA appropriate to inbound heading using sector entry according to AIP</p> <p>4.2 Published holding pattern is flown not below the specified minimum altitude, allowing for wind effect, turning inbound on the prescribed track</p> <p>4.3 Holding pattern is departed in accordance with ATC instructions</p>

ELEMENT	PERFORMANCE CRITERIA
5 Comply with Air Traffic Control rules and procedures for IFR flights	<p>5.1 Separation from other air traffic in IMC/simulated IMC is maintained</p> <p>5.2 Airspace requirements are complied with utilising IFR procedures</p> <p>5.3 Two-way communication is maintained with ATS and other aircraft in accordance with IFR procedures</p> <p>5.4 ATC clearances and/or radar vectoring instructions are complied with</p>
6 Manage hazardous weather conditions	<p>6.1 Hazardous weather conditions are identified and avoided</p> <p>6.2 Procedures for penetration of hazardous weather are demonstrated and/or explained</p> <p>6.3 Aircraft systems are employed to mitigate the effects of hazardous weather</p>
7 Demonstrate turbulence penetration technique	<p>7.1 Aircraft is configured to comply with turbulence penetration procedures in accordance with Flight Manual/POH</p> <p>7.2 Passenger and crew are restrained in accordance with regulations</p> <p>7.3 Procedures for penetrating turbulence are explained and demonstrated</p>

Required Skills and Knowledge

REQUIRED KNOWLEDGE AND SKILLS

This describes the essential knowledge and skills and their level required for this unit.

Required knowledge:

- ATC rules and procedures:
- Airways clearance requirements for operating in all classes of airspace, including lead time required for flight plan submission, contents, 'clearance void time', and 'readback' requirement
- Airways clearance requirements for entering, operating in and departing CTA and CTR, including what details to provide to ATC, and what details to expect from ATC
- Controlled area protection
- ATC requirements for a change of level in CTA, including in an emergency situation
- Departure, climb, transition to cruise (levelling out), cruise, change of levels, descent and visual approach procedures, day and night, in CTA and CTR
- Separation provisions between IFR flights, and IFR and VFR flights in the various classes of CTA
- Separation provisions between IFR flights, and IFR and VFR flights in GAAP CTR
- Radio procedures in CTA, CTR, Class G airspace and at non-controlled aerodromes
- Loss of radio communication procedures in CTA, CTR, Class G airspace and at non-controlled aerodromes
- Abnormal operations and/or emergency procedures in CTA, CTR, Class G airspace and at non-controlled aerodromes
- Radar services that are provided by ATC
- Radar vectoring procedures, including radio procedures and phraseologies
- Maximum permissible time interval is between ATC transmissions during radar vectoring
- Radar emergency procedures, including loss of radio communication, radar failure, transponder emergency codes, and aircraft emergencies
- Departure, climb, transition to cruise (levelling out), cruise, change of levels, descent, and arrival procedures in Class G airspace and at non-controlled aerodromes
- Visual approach procedures, day and night, in Class G airspace and at non-controlled aerodromes, including landing manoeuvres, cancellation of SARWATCH, and operation of VHF aerodrome lighting (PAL)
- Requirements and procedure for a diversion to an alternate aerodrome
- NDB:
 - Effects of coastal refraction, night error, thunderstorms, mountainous areas, types of terrain and altitude of aircraft on NDB indications or range
 - Methods of selecting and using the most appropriate NDB for tracking during navigation
 - NDB tracking techniques, procedures and limitations
 - Procedures for sector entry and holding using the NDB

REQUIRED KNOWLEDGE AND SKILLS

- VOR:
- VOR instrument settings required to provide command indications when flying on given tracks both to and from the VOR
- VOR tracking techniques, procedures and limitations
- Procedures for sector entry and holding using the VOR
- GPS:
- Principles of operation, performance limitations and errors of a GPS system
- Methods of position fixing using a GPS system
- GPS operating procedures which provide safeguards against navigational errors and loss of situational awareness
- GPS operating procedures for typical navigational tasks using a specific type of aircraft equipment
- Indications of waypoint passage
- GPS operational and serviceability checks
- Human factors limitations associated with the use of GPS equipment
- Requirements applicable to pilots and equipment for GPS operations
- Parameters applicable to tracking tolerances, automatic waypoint sequencing, CDI sensitivity and RAIM availability
- Mode of operation required during each segment of a GPS/NPA, the conditions required to transition to and operate in that mode, and the associated CDI sensitivity and RAIM protection provided
- Parameters applicable to RAIM warnings in the en route, terminal and approach modes
- Effect of availability or otherwise of baro-aiding on RAIM availability and prediction
- Effect of satellite unserviceability on the reliability of each type of prediction
- Effect of each type of RAIM prediction operational requirements
- Operational requirements which apply to planning a flight on the basis of conducting a RNAV (GNSS) procedure at the destination
- Factors that may adversely affect the conduct of a GPS/NPA and explain suitable pilot procedures to minimise such effects
- Operating procedures for GNSS equipment which reduce or eliminate errors due to any of these factors

Required skills:

- Perform the navigational functions within the parameters of the applicable regulations, orders and operations manual procedures
- Maintain compliance with regulatory requirements
- Select and use appropriate navigational instruments and aids
- Source and interpret aviation weather forecast products and services appropriate to flight

REQUIRED KNOWLEDGE AND SKILLS

planning and navigation procedures

- Apply air safety practices and regulations
- Recognise significant variances from forecast meteorological conditions and take appropriate actions, including the issue of an AIREP
- NDB:
 - Determine NDB station passage, abeam NDB station, NDB bearing the aircraft is on, track error and/or drift experienced, from ADF relative bearing indications
 - Calculate track to and from the NDB, given heading and relative bearings
 - Calculate heading to steer to intercept a new or original track to or from a NDB
 - Calculate heading to steer to intercept desired inbound track before reaching the NDB
 - Calculate relative bearing which will indicate that a desired track to or from a NDB has been intercepted, given the intercept heading
 - Fix position, given relative bearing indications utilising two NDB stations
- VOR:
 - Determine scalloping, VOR station passage, abeam VOR station, VOR radial the aircraft is on, track error and/or drift experienced, from VOR cockpit indications
 - Determine off-track distance experienced from VOR and DME cockpit indications
 - Calculate the heading to steer to intercept a new or original track to or from a VOR
 - Fix position, given cockpit instrument indications utilising two VOR stations
 - Fix position, given instrument indications utilising combinations of VOR, NDB and DME
- GPS:
 - Interpret typical GPS navigational displays LAT/Long, distance and bearing to waypoint, CDI
 - Maintain interception and maintenance of GPS defined tracks
 - Determine TMG, GS, ETA, time and distance to WPT, WV in flight
 - Recognise and take appropriate action for GPS warnings and messages
 - Predict RAIM availability at destination and ETA
 - Predict within 1 hour before departure the availability of approach RAIM at the destination or alternate aerodrome within 15 minutes of ETA, and limitations that apply to the prediction
 - Apply operational requirements which apply to planning a flight on the basis of conducting a RNAV (GNSS) procedure at the destination
- Communicate effectively with others when navigating an aircraft - IFR
- Read and interpret instructions, regulations, procedures and other information relevant to navigating an aircraft - IFR
- Interpret and follow operational instructions and prioritise work
- Complete documentation related to navigating an aircraft - IFR
- Operate electronic communication equipment to required protocol
- Work collaboratively with others when navigating an aircraft - IFR
- Adapt appropriately to cultural differences in the workplace, including modes of behaviour and

REQUIRED KNOWLEDGE AND SKILLS

interactions with others

- Promptly report and/or rectify any identified problems that may occur when navigating an aircraft - IFR in accordance with regulatory requirements and workplace procedures
- Implement contingency plans for unexpected events that may arise when navigating an aircraft - IFR
- Apply precautions and required action to minimise, control or eliminate hazards that may exist while navigating an aircraft - IFR
- Monitor and anticipate operational problems and hazards and take appropriate action
- Monitor work activities in terms of planned schedule
- Modify activities dependent on differing workplace contingencies, situations and environments
- Work systematically with required attention to detail without injury to self others, or damage to goods or equipment
- Adapt to differences in equipment and operating environment in accordance with standard operating procedures
- Select and use required personal protective clothing and equipment conforming to industry and OH&S standards
- Implement OH&S procedures and relevant regulations
- Identify and correctly use equipment required when navigating an aircraft - IFR

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills, the range statement and the assessment guidelines for this Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

- The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria of this unit and include demonstration of applying:
 - the underpinning knowledge and skills
 - relevant legislation and workplace procedures
 - other relevant aspects of the range statement

Context of and specific resources for assessment

- Performance is demonstrated consistently over a period of time and in a suitable range of contexts
- Resources for assessment include:
 - a range of relevant exercises, case studies and/or other simulated practical and knowledge assessment, and/or
 - access to an appropriate range of relevant operational situations in the workplace
 - In both real and simulated environments, access is required to:
 - relevant and appropriate materials and equipment, and
 - applicable documentation including workplace procedures, regulations, codes of practice and operation manuals

Method of assessment

- Assessment of this unit must be undertaken by a registered training organisation
- As a minimum, assessment of knowledge must be conducted through appropriate written/oral tests
- Practical assessment must occur:
 - through activities in an appropriately simulated environment at the registered training organisation, and/or
 - in an appropriate range of situations in the workplace

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

- | | |
|--------------------------------------|---|
| Tasks may be undertaken in: | <ul style="list-style-type: none">• IMC• VMC with simulated IMC conditions |
| Performance may be demonstrated in: | <ul style="list-style-type: none">• single engine aircraft• multi engine aircraft• synthetic training device approved by the relevant authority• variable air traffic conditions• variable weather conditions• variable flight situations• abnormal situations• classes of airspace as designated by the Civil Aviation Safety Authority |
| Aircraft may include: | <ul style="list-style-type: none">• fixed wing• helicopter• other commercial or military aircraft |
| Crew may include: | <ul style="list-style-type: none">• single pilot• multi crew |
| Instruments may be: | <ul style="list-style-type: none">• fitted flight instruments suitable for instrument flight• head up display suitable for instrument flight |
| Limitations may be imposed by: | <ul style="list-style-type: none">• local noise abatement requirements and curfews• airspace endorsements |
| Classes of airspace may be: | <ul style="list-style-type: none">• as designated by the regulator• restricted and danger areas• military control zones• Air Defence Identification Zones |
| Diversion requirement may include: | <ul style="list-style-type: none">• meteorological hazard• fuel requirements• aircraft or airfield system failure/degrade• airspace• ATC direction• operational hazard |
| Operational information may include: | <ul style="list-style-type: none">• meteorological• NOTAMS• lighting• Approach Aids |

RANGE STATEMENT

Navigation aids/systems may include:

- ADF (Automatic Direction Finder)
- VOR (VHF Omni-directional Radio Range)
- DME (Distance Measuring Equipment)
- RADAR
- GPS (Global Positioning System)
- FMS (Flight Management Systems)
- Moving Map Displays
- TACAN
- INS (Inertial Navigation System)
- FDS (Flight Director System)
- Autopilot system
- Weather Radar
- navigation computers

Conditions may include:

- a method of simulating IMC
- simulated icing conditions
- moderate turbulence
- simulated hazardous weather
- Autopilot/Flight Director
- FMS/ other NAV system
- simulation of emergency and abnormal procedures

Dependent on the type of organisation concerned and the local terminology used, workplace procedures may include:

- company procedures
- enterprise procedures
- organisational procedures
- established procedures
- standard operating procedures

Information/documents may include:

- relevant sections of Civil Aviation Safety Regulations and Civil Aviation Orders
- in Defence context, relevant Defence Orders and Instructions
- Flight Manual/Pilot's Operating Handbook (POH)
- Manual of Standards - Pilot Licensing (MOS-PL)
- Aeronautical Information Publication (AIP)
- En Route Supplement Australia (ERSA)
- charts
- operations manuals
- approved checklists
- workplace procedures and instructions and job specification
- induction and training materials
- conditions of service, legislation and industrial agreements

RANGE STATEMENT

Applicable regulations and legislation may include:

- including workplace agreements and awards
- relevant Civil Aviation Safety Regulations and Civil Aviation Orders
- in Defence context, relevant Defence Orders and Instructions
- relevant state/territory OH&S legislation
- relevant state/territory environmental protection legislation
- relevant Australian Standards
- relevant licence and aircraft rating requirements of the Civil Aviation Safety Authority (CASA) such as:
 - Manual of Standards
 - relevant Defence documentation such as:
 - Defence Orders and Instructions
 - approved curricula and training documentation

Performance includes tolerances specified in either of:

Unit Sector(s)

Not applicable.

Competency field

Competency Field

H - Route Planning and Navigation