Australian Government

Department of Education, Employment and Workplace Relations

AVIH4013A Navigate aircraft - NVFR

Revision Number: 1

AVIH4013A Navigate aircraft - NVFR

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

This unit involves the skills and knowledge required to navigate an aircraft under Night Visual Flight Rules (NVFR). 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 Night Visual Flight Rules (NVFR); and aircraft control principles, regulations, safety codes, protocols and procedures required to navigate aircraft under Night Visual Flight Rules 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	1.1 Appropriate navigation aids/systems for the planned NVFR flight are selected and operated in accordance navigation aid/system requirements 1.2 Integrity of navigation aid/systems information is monitored and maintained
2 Navigate the aircraft in Night VFR	2.1 Cockpit and instrument lighting are adjusted to allow reference to documentation, instruments and lookout 2.2 Aircraft position fix is determined visually or with reference to navigation aid/system 2.3 Tracks are intercepted to and from visually or with reference to navigation aids/systems 2.4 Track is maintained within tolerances specified in AIP 2.5 Timings are recorded, assessed and revised as required 2.6 Station passage is recognised 2.7 GPS/DME arc procedure is performed within tolerances specified in AIP if applicable 2.8 Planned route above Lowest Safe Altitude (LSALT) is maintained in accordance with NVFR 2.9 Route and destination weather conditions are monitored and appropriate actions are executed 2.10 Descent point is calculated and/or amended
3 Conduct a diversion to revised route or alternate aerodrome at night	3.1 Requirement for an unplanned diversion is recognised and confirmed 3.2 Route to alternate aerodrome, navigation aid and /or revised track is determined 3.3 Planned route maintains height above LSALT in accordance with regulations while flying under NVFR 3.4 Flight planned route is diverted to track to alternate aerodrome, navigation aid and/or aerodrome 3.5 Operational information for alternate aerodrome/s is reviewed and applied according to regulations and/or operator procedures 3.6 Fuel plan is reviewed and amended according to regulations and/or operator procedures
4 Make visual departure at night	4.1 Obstacle clearance is ensured until reaching LSALT 4.2 Departure track is intercepted within 5 nm of aerodrome
5 Make visual approach at night	5.1 Descent below LSALT is conducted in accordance with instructions in AIP 5.2 Track is maintained to destination aerodrome in accordance with instructions in AIP

ELEMENT	PERFORMANCE CRITERIA
6 Comply with Air Traffic Control rules and procedures for NVFR flights	6.1 Separation from other air traffic under NVFR is maintained 6.2 Airspace requirements are complied with utilising NVFR procedures 6.3 Two-way communication is maintained with ATS and other aircraft in accordance with NVFR procedures 6.4 ATC clearances and/or radar vectoring instructions are complied with
7 Manage hazardous weather conditions	7.1 Hazardous weather conditions are identified and avoided 7.2 Procedures for avoidance of hazardous weather are demonstrated and/or explained 7.3 Aircraft systems are employed to mitigate the effects of hazardous weather

Required Skills and Knowledge

REQUIRED KNOWLEDGE AND SKILLS

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

Required knowledge:

- Navigation requirements for a night visual flight using radio, self-contained or long-range navigation systems
- Navigation requirements for a night visual flight using visual reference to ground and water
- Navigation tolerance for a night visual flight avoiding CTA
- Requirements for positive radio fixing and the most precise track guidance
- Navigation requirements for night visual flight with respect to time interval between fixes, accuracy of time reference, and accuracy and procedures in track-keeping
- Procedures of night visual flight in all classes of airspace when diverting from track due to navigation or weather
- Compulsory reporting points for route selected
- Dimensions of the significant safety sector when calculating LSALT for a route not published on a chart
- Methods of calculating LSALT for a route not published on a chart
- Explanation of conditions for descent below LSALT
- Pre-flight altimeter accuracy check for a night visual flight
- 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 at night, in CTA, CTR, Class G airspace and at non-controlled aerodromes
- Separation provisions between NVFR flights, and IFR and VFR flights in the various classes of CTA
- Separation provisions between NVFR 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

REQUIRED KNOWLEDGE AND SKILLS

- Radar vectoring procedures, including radio procedures and phraseologies
- Maximum permissible time interval in between ATC transmissions during radar vectoring
- Radar emergency procedures, including loss of radio communication, radar failure, transponder emergency codes, and aircraft emergencies
- Operation of VHF aerodrome lighting (PAL)
- Requirements and procedure for a diversion to an alternate aerodrome
- Navigation aids/systems as applicable to rating/endorsement requirements may include:
- 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 position fixing, tracking techniques, procedures and limitations
- 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
- DME
- DME or GPS arrival procedures and limitations in all classes of airspace
- DME or GPS arrival information
- Pilot's responsibilities when DME or GPS arrival is conducted outside controlled airspace
- Conditions permitting descent below LSALT
- Procedure for joining the circuit using a DME or GPS arrival
- Principles of operation of DME or the GPS radio equipment
- Procedures for handling loss of radio communication during a DME or GPS arrival
- 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

REQUIRED KNOWLEDGE AND SKILLS

- 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:

- Determine route for night visual flight with respect to forecast weather, controlled airspace, Prohibited, Restricted and Danger Areas, specified route limitations, airways operational requirements, and availability of published routes, en route alternate aerodromes, navigation aids, rated coverage and radio communication
- Determine whether a flight may proceed based on route, aircraft equipment and night VFR navigation requirements
- Calculate LSALT for a night visual flight for a route published on a chart
- Calculate LSALT when uncertain of position
- Apply altimetry procedures to all stages of a night visual flight
- 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 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
- Use navigation aids/systems, as applicable to rating/endorsement requirements, which may include:
- 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

REQUIRED KNOWLEDGE AND SKILLS

- 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
- DME
- Interpret DME or GPS arrival information
- 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 - NVFR
- Read and interpret instructions, regulations, procedures and other information relevant to navigating an aircraft - NVFR
- Interpret and follow operational instructions and prioritise work
- Complete documentation related to navigating an aircraft - NVFR
- Operate electronic communication equipment to required protocol
- Work collaboratively with others when navigating an aircraft - NVFR
- Adapt appropriately to cultural differences in the workplace, including modes of behaviour and interactions with others
- Promptly report and/or rectify any identified problems that may occur when navigating an aircraft - NVFR in accordance with regulatory requirements and workplace procedures
- Implement contingency plans for unexpected events that may arise when navigating an aircraft - NVFR

REQUIRED KNOWLEDGE AND SKILLS

- Apply precautions and required action to minimise, control or eliminate hazards that may exist while navigating an aircraft - NVFR
- 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 - NVFR

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:	• night VFR conditions
Performance may be demonstrated in:	• 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:	• fixed wing • helicopter • other commercial or military aircraft
Crew may include:	• single pilot • multi crew
Instruments may be:	• fitted flight instruments suitable for NVFR flight • head up display suitable for NVFR flight
Limitations may be imposed by:	• local noise abatement requirements and curfews • airspace endorsements
Classes of airspace may be:	• as designated by the regulator • restricted and danger areas • military control zones • Air Defence Identification Zones
Diversion requirement may include:	• meteorological hazard • fuel requirements • aircraft or airfield system failure/degrade • airspace • ATC direction • operational hazard
Operational information may include:	• meteorological • NOTAMS • lighting • Approach Aids
Navigation aids/systems may	• ADF (Automatic Direction Finder)

RANGE STATEMENT

include:	• 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:	• 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 including workplace agreements and awards
Applicable regulations and	• relevant Civil Aviation Safety Regulations and Civil Aviation Orders

RANGE STATEMENT

legislation may include:	• in Defence context, relevant Defence Orders and Instructions • relevant state/territory OH&S legislation • relevant state/territory environmental protection legislation • relevant Australian Standards
Performance includes tolerances specified in either of:	• 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

Unit Sector(s)

Not applicable.

Competency field

Competency Field H - Route Planning and Navigation