



Australian Government

AVIW3026 Conduct night vision imaging system operations

Release: 1

AVIW3026 Conduct night vision imaging system operations

Modification History

Release 1. This is the first release of this unit of competency in the AVI Aviation Training Package.

Application

This unit involves the skills and knowledge required to conduct night vision imaging system (NVIS) operations, in compliance with relevant regulatory requirements of the Civil Aviation Safety Authority (CASA) and national operating standards.

It includes preparing for, conducting and concluding night vision imaging system operations as an individual flight crew member.

This unit addresses aviation technical skill requirements (physical, mental and task-management abilities) related to equipment and system operations of flight crew/s, and contributes to safe and effective performance in complex aviation operational environments.

Operations are conducted as part of recreational, commercial and military aircraft activities across a variety of operational contexts within the Australian aviation industry.

Work is performed independently or under limited supervision within a single-pilot or multi-crew environment.

Licensing, legislative, regulatory or certification requirements are applicable to this unit.

Use for Defence Aviation is to be in accordance with relevant Defence Orders, Instructions, Publications and Regulations.

Pre-requisite Unit

Not applicable.

Competency Field

W – Equipment and Systems Operations

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare for night vision imaging system operations	1.1 Pre-flight information is obtained and prepared to identify safe flight routes, weather and operating terrain 1.2 Aviation risk management processes are implemented to minimise risk to safety of flight, personnel and equipment 1.3 NVIS lighting limitations/considerations are reviewed 1.4 Crew briefing is delivered or received about NVIS operational objectives 1.5 NVIS equipment is obtained and pre-operational checks are completed in accordance with organisational policies and procedures 1.6 Aircraft NVIS sensors, aids and equipment serviceability preparatory and adjustments are completed, and defects are identified and reported in accordance with organisational policies and procedures
2 Conduct night vision imaging system operations	2.1 NVIS equipment and personal flight equipment are used to safely operate aircraft systems 2.2 Instrumentation and/or NVIS checks are completed at appropriate times to identify visual clues 2.3 Night vision human factors are monitored and corrective action is taken as required in accordance with organisational policies 2.4 Reconnaissance of operational area is completed to ensure aircraft safety in accordance with organisational policies 2.5 NVIS emergency and abnormal conditions are identified and reacted to in accordance with organisational procedures and practices 2.6 Situational awareness is maintained to ensure safety of flight, crew, personnel and equipment 2.7 Individual flight crew coordination and management principles are implemented to ensure operational intent, in accordance with organisational policies
3 Conclude night vision imaging	3.1 Post-flight analysis and debriefing is conducted in accordance with organisational policies

system operations

- 3.2 Post-flight documentation is completed and processed
- 3.3 After-use servicing is completed and identified equipment defects are reported in accordance with organisational policies

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

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|---|--|
| Aircraft must include one or more of the following: | <ul style="list-style-type: none"> • fixed or rotary wing aircraft compatible with and authorised to conduct NVIS operations • single or multiple engine |
| Pre-flight information must include: | <ul style="list-style-type: none"> • authorised aviation maps, charts and flight supplements • meteorological information • NVIS risk assessments and/or management plans • terrain data |
| NVIS sensors, aids and equipment must include one or more of the following: | <ul style="list-style-type: none"> • active infrared (IR) • enhanced vision systems • forward looking infra red radars • head up displays • laser range gating • night vision devices • night vision goggles • thermal imaging systems |
| NVIS sensors, aids and equipment serviceability checks must include one or more of the following: | <ul style="list-style-type: none"> • aircraft internal/external night aided lighting checks • aural and visual warning system checks • eyepiece or objective lens cannot be focused • eye-span and eye relief cannot be achieved • image obscurations • inability to focus • intermittent operation • low battery or power indications • night aided sensors, aids and devices NVIS sensors fail to initialise/self-test |

- NVIS personal flight equipment must include one or more of the following:
- NVIS equipment mounting systems unserviceable
 - non operation
 - poor or degraded image quality
 - eye protection
 - flares, strobes, beacons and IR markers
 - handheld torches
 - IR compatible lighting systems
 - lip and finger lights
 - personal life-support equipment
- Emergency and abnormal conditions must include one or more of the following:
- aircraft abnormal or emergency situations
 - breakdown in crew coordination and communications
 - degraded or loss of situational awareness
 - inadvertent instrument meteorological conditions (IMC)
 - night aided aircraft and personal equipment failures

Unit Mapping Information

This unit replaces and is equivalent to AVIW3026A Conduct night aided vision aviation operations.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=4725260a-0af3-4daf-912b-ef1c2f3e5816>

Assessment Requirements for AVIW3026 Conduct night vision imaging system operations

Modification History

Release 1. This is the first release of this unit of competency in the AVI Aviation Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least one occasion and include:

- applying principles of crew coordination and management relevant to night vision imaging system (NVIS) operations during flight
- applying relevant aeronautical knowledge
- applying relevant legislation and workplace procedures
- applying visual scanning techniques and procedures during NVIS operations
- communicating effectively with others
- conducting or participating in pre-flight, flight and post-flight briefings and debriefings relevant to NVIS operations
- implementing aviation risk management processes, procedures and required actions to minimise, control or eliminate identified hazards
- implementing contingency plans
- implementing work health and safety (WHS)/occupational health and safety (OHS) procedures and relevant regulations
- interpreting and calculating luminance/illumination levels for NVIS operations
- interpreting and following operational instructions and prioritising work during NVIS operations
- maintaining or regaining degraded, situational awareness while conducting NVIS operations
- modifying activities depending on operational contingencies, risk situations and environments
- monitoring work activities in terms of planned schedule
- operating and adapting to differences in communications equipment in accordance with organisational procedures
- participating in or delivering stakeholder briefing requirements including:
 - planning for recovery from inadvertent instrument meteorological conditions (IMC) entry and loss of visual cues
 - transit flight, let-down and approach procedures
 - landing and take-off procedures
 - role functions and procedures
 - contingency management

- post-flight debriefings
- analysing objectives and outcomes of flight and reviews of operating procedures
- analysing effectiveness and efficiency in the use and performance of role equipment
- identifying achievements and faults or errors that occurred during NVIS flight and providing guidance and feedback to other flight crew members
- ensuring inspection, servicing and stowage arrangements for NVIS equipment
- performing blind cockpit or cabin checks during relevant flight operational checks and procedures
- performing or contributing to relevant flight planning procedures
- performing NVIS sensor, equipment or device pre- and post-flight inspections and adjustments to ensure optimisation for use and future operation
- planning navigation and/or operational requirements
- planning own work, predicting consequences and identifying improvements
- reporting and rectifying identified problems, faults or malfunctions promptly, in accordance with workplace procedures
- working collaboratively with others
- working systematically with required attention to detail without injury to self or others, or damage to aircraft, crew, personnel and equipment.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- aeromedical factors under NVIS operations:
 - visual performance limitations:
 - field of view (FOV)
 - eye relief distance
 - dynamic visual scan
 - unaided peripheral cueing
 - visual acuity
 - visibility determinants
 - contrast
 - depth perception and related functions
 - dynamic and static visual flight cues
 - NVIS and helmet assembly
 - eye protection
- aviation risk management processes and procedures applicable to NVIS operations
- CASR Part 61 Manual of Standards aeronautical knowledge relevant to NVIS operations

- common NVIS equipment faults and defects
- concepts and procedures relating to blind cockpit and cabin checks
- crew coordination within an NVIS operating environment:
 - scanning arcs of responsibility
 - NVIS operations terminology
 - degraded situational awareness due limited visibility
- cues and techniques that optimise navigation processes under NVIS conditions
- effect of meteorological conditions on illumination levels and NVIS equipment, sensor and/or device performance
- effects of atmospheric conditions on electromagnetic energy and the resolution of NVIS sensors, equipment and devices
- emergency and abnormal situation procedures applicable to NVIS specific operations
- flight planning considerations, terrain and route selection factors applicable to NVIS operations
- flight rules and NVIS legislation:
 - privileges and limitations of an NVIS rating and endorsement
 - requirements for conducting a flight using NVIS
 - requirements for conducting a flight using NVIS below 500 feet above ground level (AGL)
 - minimum aircraft equipment requirements
 - determining if NVIS equipment meets minimum standards to be authorised for use
- focal and ambient vision
- human factors under NVIS conditions:
 - fatigue:
 - acute
 - cumulative
 - circadian
 - visual fatigue
 - psychological fatigue
 - physical fatigue
 - sleep quality and sleep debt
 - circadian rhythm:
 - biological rhythm
 - light/dark adaption
 - dark adaptation:
 - foveal cone stimulation
 - time to adapt
 - performance/alertness
 - pre-adapt to reverse cycle operations
 - crew duty limits and flight crew rostering
 - mission/task planning

- pharmaceutical support
- flight crew management strategies:
 - sleep environment
 - napping strategies
 - physical fitness
 - coffee and alcohol effects
 - self-imposed restrictions
- post-flight visual problems:
 - transient colour distortion
 - eye fatigue
- NVIS operations – hypoxia considerations
- human physiological functions and the electromagnetic spectrum under NVIS conditions
- internal and external organisational regulatory requirements for NVIS operations
- key visual cues for identifying and interpreting terrain features and obstacles under NVIS conditions, including shadow and surface
- meteorological requirements for NVIS operations
- minimum crewing requirements for the conduct of NVIS operations
- NVIS equipment components and their functions
- NVIS field of view, field of regard and how they relate to visual scanning techniques
- NVIS hazards:
 - non-trained personnel
 - non-compatible lighting
- NVIS operations crew coordination procedures during pre-flight, flight operations and post-flight activities
- NVIS operations qualification, currency and recency requirements
- NVIS techniques for adapting visually to night conditions
- organisational policies that apply to storage, handling, usage and control of NVIS equipment, sensors, aids and devices
- organisational requirements for NVIS equipment aircraft compatibility
- potential NVIS illusions and misperceptions and their effects on spatial orientation
- procedures and techniques to enhance in-flight navigation during NVIS operations
- relationship between illuminance and luminance
- risk management processes and procedures applicable to NVIS operations
- self-imposed and physiological fatigue issues that impact on NVIS operations
- sources, types and effects of illumination levels in NVIS operations
- terrain interpretation and navigation techniques
- types of aviation NVIS operations
- WHS/OHS issues applicable to conducting night aided aviation operations.

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the *Standards for Registered Training Organisations* current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the *Standards for Registered Training Organisations* current at the time of assessment.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or simulations
- acceptable means of simulation assessment
- applicable documentation including workplace procedures, regulations, codes of practice and operation manuals
- relevant materials, tools, equipment and personal protective equipment currently used in industry.

Links

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