Australian Government

Assessment Requirements for NWPHYS005 Use alternate positioning systems to gather data

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the NWP National Water Training Package.

Performance Evidence

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

- analysing the sources and magnitude of uncertainties associated with positioning methods and positioning systems
- comparing historical surveys with modern surveys and report
- comparing IMU heading measurements with magnetic compasses and gyrocompasses
- calculating dynamic alignment of inertial navigational systems (INS) and analysing impacts
- analysing distortions in projection types
- monitoring, reviewing and assessing the performance of positioning systems in both relative and absolute terms using appropriate statistical tools analysing the following:
  - accuracy
  - precision
  - repeatability
- performing complex calculations to provide the final solution for a position
- selecting and applying projection formulae to provide an appropriate graphic representation
- selecting the appropriate projection type for product generation
- using acoustic positioning systems in offshore survey operations
- using inertial motion units (IMU) including north finding and heave estimation

Knowledge Evidence

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

- analytical projection formulae and planimetric coordinates
- baseline equipment used for calculating positions including:
  - depth sensors
  - integration with INS and velocity sensors
  - purpose of acoustics for positioning towed vehicles
  - remotely operated underwater vehicles (ROV) and autonomous underwater vehicles (AUV)

    - transponders
- characteristics of legacy positioning systems
- complex mathematical calculations relevant to determining position using position system data including total propagated uncertainty in vertical and horizontal
- differences between IMU and INS
- geometrical properties of map projections including:
    - direction associated with different map projections
    - distortions in distance
- inertial measurement units (IMU) of a survey platform including:
    - heave estimation
    - north finding
    - pitch
    - roll
    - yaw
- INS including:
    - procedures for static and dynamic alignment
    - acoustic doppler current profiler (ADCP) and INS
    - Global Navigation Satellite System (GNSS) and INS
    - ultra short baseline (USBL), Depth and INS
- mobile surveys including:
    - GNSS equipment
    - IMU and INS
    - acoustic positioning
- operational procedures for correct installation of gyrocompasses and accelerometers
- positioning methods including:
    - Continuously Operating Reference Stations (CORS) networks
    - intersection
    - post processed GNSS
    - real time kinematic
    - resection
    - satellite corrections
    - static network
- principles of cartography
- principles of integrated underwater positioning systems
- relevant documentation and product including:
    - charts
    - GIS
    - plans
    - reports
- remote survey platforms including:

- autonomous underwater vehicles
- drones
- gliders
- unmanned surface vehicles

- set up procedures for calculating the following baselines:
  - long
  - short
  - ultra-short
- static surveys including:
  - acoustic positioning
  - GNSS observations
  - levelling instruments
  - total stations
- types of projections including:
  - conical
  - cylindrical
  - stereographic
  - Universal Transverse Mercator (UTM) system

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations. Where this is not appropriate, assessment must occur in suitable simulated workplace operational situations reflecting actual 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:

- relevant and appropriate materials, tools, facilities, equipment and personal protective equipment currently used in industry
- applicable relevant documentation including workplace procedures, industry standards, equipment specifications, regulations, codes of practice, and operation manuals.

Links

Companion Volume Implementation Guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=26336bc0-04e5-49d9-8c31-46c49b6a0037