

Packaging of Competency Standards for Vocational Qualifications

MMCD3001 TTNVQ Level 3 – Commercial Diving (Air)

Unit Code	Unit Title	Mandatory/Elective
MM00001	Communicate in the Workplace	Mandatory
MM00002	Follow Health, Safety, Emergency and Accident Procedures at the Workplace	Mandatory
MM00003	Improve Work Performance	Mandatory
MM00004	Provide Quality Service to Customers	Mandatory
MM00005	Reduce Risk to Health and Safety in the Workplace	Mandatory
MM00006	Work with Others	Mandatory
MM00007	Perform Underwater Work using SCUBA	Mandatory
MM00008	Perform Underwater Work using Surface Demand Diving Equipment no Deeper than 30 meters	Mandatory
MM00009	Perform Underwater Work using Surface Demand Diving Equipment to 50 meters Incorporating Wet Bell	Mandatory
MM00010	Use Power Tools	Mandatory
MM00011	Use Hand Tools	Mandatory
MM00012	Carry Out Measurements and Calculations	Mandatory
MM00013	Prepare and Operate Manual Metal Arc Welding Equipment	Elective

To achieve this qualification all mandatory units must be achieved.

MM00001

Communicate in the Workplace

Unit Descriptor:

This unit deals with skills and knowledge required for interacting with people internally and externally through verbal, nonverbal and written communications in the workplace and the ability to follow verbal and written workplace instructions

ELEMENTS

Candidates must be able to:

PERFORMANCE CRITERIA

1	Communicate verbally	1.1	Use clear concise and appropriate language with client in accordance with organisation's requirements
		1.2	Use active listening skills and questioning techniques to clarify supervisor's instructions
		1.3	Use established communication paths for routine and non routine communication with personnel
2	Communicate non verbally	2.1	Ensure non verbal communication is constructive and tailored to the audience
		2.2	Ensure non verbal communication is consistent with verbal communication
3	Communicate with team members and supervisors	3.1	Receive and respond to instructions from supervisor
		3.2	Relay divers status as divers tender
		3.3	Listen to and work in accordance with pre dive briefing
4	Give and receive instructions	4.1	Act upon instructions received within an agreed time frame to meet organisation needs
		4.2	Identify and communicate difficulties/problems to the appropriate person in a timely manner

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| | 4.3 | Seek clarification of instructions from appropriate persons | |
| | 4.4 | Relay instructions clearly and obtain confirmation of understanding | |
| 5 | Take part in group discussions and informal meetings | 5.1 | Make contributions in small informal group activities and meetings to facilitate outcomes |
| | | 5.2 | Seek and provide responses in a constructive manner to other group members |
| | | 5.3 | Understand, acknowledge and represent to others, views and opinions of individuals/ group |
| 6 | Prepare and process routine written correspondence, notes and records | 6.1 | Present in a format, language and timeframe information and ideas to meet organisation's requirements |
| | | 6.2 | Ensure presentation of written documents meets organisation's standards of style and accuracy |
| | | 6.3 | Process documents to comply with legislative requirements and organisations policy and procedures |

RANGE STATEMENT

Workplace includes:

- office
- workshop
- operational area
- large organisation
- small organisation
- one man organisation

Routine correspondence includes:

- brief notes
- documents
- number of themes covered in document would be simple and limited

Non-verbal communication includes:

- body language
- gestures and signals

Instructions include:

- verbal
- non verbal
- written and may include requests
- directions

Modes of communication include:

- face to face
- radio
- telephone
- lifeline signal code
- information technology systems
- Intercom
- gestures
- use of interpreters
- signals
- visual signalling re vessels

Client needs include:

- information
- advice
- directions
- assistance

Clients include:

- external or internal
- members of other departments
- representatives of other organisations
- representatives of non-government organisations
- contractors

- members of the public
- persons from culturally and linguistically diverse backgrounds

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. what are the importance of tone and body language in communication
2. what are the organisation's policies, procedures and guidelines
3. how to use technology effectively

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

Evidence should include a demonstrated ability to:

- follow and produce written communications
- receive and communicate information, instructions and views
- interact with clients
- communicate in a group setting
- demonstrate a command of the official language
- comply with organisational guidelines policies and procedures

(2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

(3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00002

Follow Health, Safety, Emergency and Accident Procedures at the Workplace

Unit Descriptor:

This unit deals with the skills and knowledge required to follow health, safety, emergency and accidents procedures. This unit applies to all individuals working within commercial diving.

ELEMENTS

PERFORMANCE CRITERIA

Candidates must be able to:

1	Follow workplace health and safety policies and procedures	1.1	Carry out working practices in accordance with legal requirements and company policies
		1.2	Follow the current workplace policies and procedures for your job role
		1.3	Rectify immediately any health and safety risks within your responsibility
		1.4	Identify and report immediately any breaches of health and safety procedures to the relevant authorities in accordance with approved company guidelines
2	Follow workplace emergency and accident procedures	2.1	Ensure personal conduct around the workplace does not endanger the health and safety of oneself/ or others following company best practices
		2.2	Follow suppliers and manufacturers instructions and/ or company best practices for safe use of equipment, materials and products
		2.3	Identify and report immediately any breaches of health and safety procedures to the relevant authorities in accordance with approved company guidelines
3	Deal with emergency situations	3.1	Recognise emergency and potential emergency situations and report to supervisor
		3.2	Determine required action for emergency and potential emergency situations and take action within the scope of individual responsibility in accordance with company guidelines

- 3.3 Seek assistance from colleagues and /or other authorities where appropriate
- 3.4 Report emergency situations in accordance with workplace procedures

RANGE STATEMENT

Legal requirements include:

- local/ national Health and Safety legislation
- company policies

Potential emergency situations include:

- decompression illness
- hypo/hyper thermia
- gas toxicity
- injured personnel
- underwater hazards

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. what are the statutory regulations and requirements regarding individuals' responsibility for the safety of themselves and others
2. what are the workplace policies and procedures that refer to personal safety and safety of others
3. who are the responsible persons within the organisation to report safety issues and accidents
4. how to interpret and follow suppliers ,manufacturers and company instructions for the safe use of equipment, materials and products
5. what action to be taken in the event of a diving specific medical emergency
6. how to administer oxygen to an injured diver
7. how to administer basic first aid
8. what are the five main systems of the body and their basic function :- cardio pulmonary, circulatory, nervous, muscular-skeletal and digestive
9. what are the principles of metabolism and gaseous exchange
10. what are the principles of compression and decompression on the divers body

11. what are the toxic effects of common gasses breathed under pressure
12. what are the physical effects of work and thermal stress on the diver
13. what are the common symptoms of decompression illness.
14. what action to take in the event of nitrogen narcosis
15. what are the specific hazards with pressure differentials

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

Evidence should include a demonstrated ability to:

- deal with emergency situations
- administer basic first aid including CPR and medical oxygen. and the evacuation of an injured diver to nearest medical facility
- follow workplace emergency and accident procedures
- follow workplace health and safety policies and procedures
- identify gas toxicity and respond to signs/ symptoms
- identify and respond to decompression illness Signs/symptoms
- plan for varying air consumption rates
- explain the function of main body systems
- explain metabolism and gaseous exchange
- identify and respond to signs/symptoms of hypo / hyperthermia
- differentiate signs /symptoms of CNS and pain only DCS, pulmonary barotraumas and A.G.E.
- identify therapeutic decompression tables.

(2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient, and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy, and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials, and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals, and reference materials

(3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00003

Improve Work Performance

Unit Descriptor:

This unit deals with the skills and knowledge required to improve work performance. This unit is about working with your employer and/or trainer to acquire new skills and knowledge that will enable the employee to improve their performance at work

ELEMENTS**PERFORMANCE CRITERIA**

Candidates must be able to:

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| 1 | Use an action plan to develop skills and knowledge | 1.1 | Seek constructive feedback from others including colleagues, customers and your manager/supervisor on how your performance at work could be improved |
| | | 1.2 | Collect feedback and plan improvements to your skills and knowledge |
| | | 1.3 | Develop work plan according to the pre diving briefing with the assistance of your manager/supervisor |
| 2 | Improve your service to customers | 2.1 | Check regularly to ensure service given meets customers' needs and expectation |
| | | 2.2 | Identify ways in which service could be improved |
| | | 2.3 | Document in one's own personal action plan improvements to skills and knowledge that will improve customer service |
| 3. | Improve your productivity and quality of good | 3.1 | Meet with your manager/supervisor and document in personal action plan improvements to skills and knowledge that will produce evidence of improved productivity and quality of work |
| | | 3.2 | Track progress through the personal action plan and take steps to implement the recommended improvement measures |

RANGE STATEMENT

Customers include:

- internal
- external

Appropriate authorities include:

- managers
- trainers
- supervisors
- consultants

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. who are the internal and external customers
2. how to develop and maintain personal action plan

EVIDENCE GUIDE**(1) Critical Aspects of Evidence**

Evidence should include a demonstrated ability to:

- communicate and work effectively with colleagues and customers
- use personal action plan as a working document and make amendments where necessary
- take part in pre dive briefing/tool box meeting
- respond positively to feedback

(2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

(3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working teams

MM00004: Provide Quality Service to Customers

Unit Descriptor:

This unit deals with the skills and knowledge required to identify and satisfy customers' needs and expectations in a positive and professional manner

ELEMENTS**PERFORMANCE CRITERIA**

Candidates must be able to:

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| 1 | Identify customer needs | 1.1 | Employ appropriate interpersonal skills to ensure that client needs are identified |
| | | 1.2 | Discuss in an articulate, easy to understand manner customers' requests and respond promptly within company policy and procedures |
| | | 1.3 | Assess customers' needs for urgency and identify priorities for service delivery |
| | | 1.4 | Provide customers with information about available options for meeting their needs and assist to identify their preferred option |
| | | 1.5 | Promote organisation's services to meet customer request within company policy and procedures |
| | | 1.6 | Complete relevant documentation in accordance with organisational policies and procedures |
| | | 1.7 | Identify personal limitations in addressing customer needs and seek assistance from relevant authority where necessary |
| 2 | Communicate with the customer | 2.1 | Conduct communication with customers and colleagues in a polite, professional and friendly manner |
| | | 2.2 | Use appropriate language and tone in both written and spoken communication |
| | | 2.3 | Use appropriate non-verbal communications in all situations |
| | | 2.4 | Show sensitivity to cultural and social differences when |

		communicating with others
	2.5	Use active listening and questioning techniques to facilitate effective two way communication
	2.6	Identify potential and existing conflicts and seek solutions
3	Establish a relationship with the customers	3.1 Confirm customer's identity and record client details and requests where appropriate in accordance with workplace procedures
		3.2 Establish rapport using active listening and empathy techniques
4	Maintain personal presentation standards	4.1 Observe appropriate dress, grooming and behaviour in the workplace
		4.2 Take into account personal presentation in the workplace environment and the impact on different kinds of clients
5	Deliver quality service to customers	5.1 Provide prompt customer service to meet identified needs in accordance with legislative and organisational requirements
		5.2 Establish appropriate rapport with customers to enable high quality service delivery
		5.3 Meet all needs and requests of customers within organisational guidelines and timeframes
		5.4 Provide service with sensitivity to customers where cultural differences and special needs exist
		5.5 Handle customer's complaints with sensitivity and courtesy in accordance with organisational requirements
6	Manage customers' expectations	6.1 Communicate range of possible organisational responses to customers in a timely manner
		6.2 Inform customers of options for further action
		6.3 Exercise courtesy, consideration and sensitivity at all times with customers
		6.4 Obtain, complete and process all necessary documentation according to organisation's policy and procedures
		6.5 Implement organisation's policy and procedures relating to confidentiality

- 6.6 Seek assistance to manage customer's expectations when necessary
- 6.7 Refer customers to the relevant authority where necessary to ensure their needs are managed efficiently

RANGE STATEMENT

Customers include:

- colleagues
- organisations
- community
- personnel from other departments
- individuals from a range of cultures
- internal or external clients
- visitors

Personal presentation includes:

- personal appearance
- correct posture
- use appropriate language and tone
- demeanour
- personality

Delivery of quality service includes:

- building rapport
- keeping promises
- keeping the client informed
- doing it right the first time
- owning the client request

Behaviour which contributes to a safe work environment includes:

- discussing and negotiating problems and tasks with other team members
- sharing knowledge and skills
- identifying and reporting any risks or hazards
- using equipment according to instructions and or company best practices

Organisation's policies and procedures include:

- rules governing disclosure of information
- confidentiality guidelines
- service standards
- organisational mission and values statements
- government policy
- professional codes of ethics and conduct

Communication with clients includes:

- spoken
- face to face
- telephone
- written
- electronic
- forms
- letters
- non verbal
- gestures
- body language
- displays of information
- photographs
- interpreters

Interpersonal skills include:

- using appropriate body language
- summarising and paraphrasing to check understanding of client's message
- providing an opportunity for the client to confirm his/her request
- seeking feedback from the client to confirm understanding of needs
- questioning to clarify and confirm the client needs
- listening actively to what the client is communicating

Client needs include:

- advice or general information
- specific information
- further information
- complaints
- reporting a matter
- design production

Legislative requirements include:

- confidentiality and privacy

- anti-discrimination
- laws and regulations
- ethics
- adherence to mandatory service and process
- standards
- occupational health and safety requirements
- environmental regulations

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. what are the organisation's role, function, mission and services
2. what are the strategies for excellent customer service
3. what are client feedback mechanisms and special needs
4. what are the organisation's policies, procedures and guidelines as required
5. what are the organisation's operations and processes

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

Evidence should include a demonstrated ability to:

- utilise skills to identify client needs
- deal with customer enquires or complaints
- articulate organisations services
- read and interpret information
- apply customer service skills to satisfy customer needs
- access and use workplace information

(2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

(3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00005

Reduce Risk to Health and Safety in the Workplace

Unit Descriptor:

This unit deals with the skills and knowledge required to reduce risk to health and safety in the workplace. This unit requires the identification of hazards in the workplace and reduces risks from those hazards by ensuring that actual working practices are followed.

ELEMENTS**PERFORMANCE CRITERIA**

Candidates must be able to:

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| 1 | Identify hazards and evaluate risk in the workplace | 1.1 | Identify and locate the person/s responsible for health and safety in workplace |
| | | 1.2 | Identify workplace policies and procedures relevant to workplace practices |
| | | 1.3 | Identify working practices within one's own personal job role that could harm individuals |
| | | 1.4 | Evaluate which of the potential harmful working practices and harmful aspects of the workplace with the highest risk to individuals |
| | | 1.5 | Report hazards which present high risk to individuals responsible for safety and health in the workplace |
| | | 1.6 | Deal with low risk hazards in accordance with workplace policies and legal requirements |
| 2 | Reduce risks to health and safety in the workplace | 2.1 | Perform working practices in accordance with legal requirements |
| | | 2.2 | Apply current workplace policies and procedures to one's own personal job role |
| | | 2.3 | Rectify health and safety risks within the scope of personal job responsibilities |
| | | 2.4 | Communicate any suggestions for reducing risks to health and safety within personal job role to the relevant persons |

- 2.5 Ensure personal conduct in the workplace does not endanger the safety and health of individuals
- 2.6 Follow workplace policies and suppliers/ or manufacturer's instructions for the safe use of equipment, materials, biological and chemical agents and products
- 2.7 Report any differences between workplace policies and suppliers/ or manufacturer's instructions as appropriate

RANGE STATEMENT

Risks resulting from include:

- the use and maintenance of machinery or equipment
- the use of biological agents or substances
- administrative and industrial working practices which do not conform to laid down practices
- unsafe behaviour
- accidental breakages and spillages
- environmental factors including Tides, weather and Maritime Traffic,
- elevated partial pressures of breathing air
- exceeding stipulated ascent rates
- pressure differentials at the worksite
- contaminants in divers breathing gas
- handling high pressure cylinders
- handling pressurized oxygen.
- injuries or illness resulting from changing ambient pressures.

Workplace policies and procedures include:

- the use of safe working methods and equipment
- the safe use of hazardous substances
- smoking, eating drinking and drugs
- what to do in the event of an emergency
- personal presentation
- the value and application of a job safety analysis
- use of marine charts and tide tables
- use of decompression tables

Working practices include:

- sanctioned, tried, tested and approved by the company
- Trinidad and Tobago standard CDTTS 539:20XX (commercial diving operations)
- current industry best practices
- equipment and procedural checklists

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. what are the statutory regulations and requirements regarding individuals' responsibility for the safety of themselves and others
2. what are the site regulations and procedures that refer to personal safety and safety of others
3. how to locate the relevant person/s responsible for health and safety in the workplace
4. what are the hazards to the diver relating to pressure differentials
5. what are the hazards involved in handling high pressure gases
6. what are the dangers in handling pure oxygen
7. how to identify potential entrapment hazards
8. what are the appropriate diver emergency signals
9. what is the appropriate action to be taken for out of air/low on air, entrapment, equipment malfunction and loss of buoyancy at surface as a diver
10. how to identify surface hazards due to shipping, sea state, currents and overhead lifts
11. how to reduce the risks of drowning
12. how to use decompression tables to identify and calculate :- no decompression limits, exceptional exposure dives, decompression stops, minimum surface intervals, nitrogen loading for repetitive dives, no fly interval, ascent rates, omitted decompression, and diving at altitude
13. how to use marine charts to determine direction, distance, depth of water and tidal set and flow.

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

Evidence should include a demonstrated ability to:

- identify hazards and evaluate both risks and potential risks in the workplace
- use decompression tables to calculate NDL, surface interval, stop times, adjusted no decompression times. no fly times, and exceptional exposure.

- reduce risks to individual's safety and health in the workplace
- identify which workplace policies and procedures are relevant to workplace practices
- handle High pressure cylinders
- comply with special precautions for storage and handling of Pure Oxygen
- display emergency signals
- achieve positive buoyancy at surface in full SCUBA for self and companion diver
- carry out procedures for lost contact with companion diver
- tow companion diver unassisted for 50 meters in full SCUBA
recover companion diver to surface from 5 MSW
- recover diver to diving platform as part of a diving team
- administer diving related first aid
- plot direction and distance on a marine chart
- estimate tidal flow and direction using a marine chart and tables

(2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy, and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials, and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals, and reference materials

(3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00006: Work with Others

Unit Descriptor:

This unit deals with the skills and knowledge required to work harmoniously and effectively with team members, colleagues and others in a work environment

ELEMENTS**PERFORMANCE CRITERIA**

Candidates must be able to:

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| 1 | Participate in the workplace/group process | 1.1 Identify the relevant work requirements for the group/process |
| | | 1.2 Ensure individual responsibility in meeting work requirements by performing to expectations |
| | | 1.3 Provide appropriate assistance and constructive contributions to other team members involved in the work group/process as required to meet work requirements |
| | | 1.4 Include time and resource constraints when planning and fulfilling work requirements |
| | | 1.5 Conduct work activities in compliance with the organisation's work policies, procedures and conventions covering acceptable workplace conduct |
| | | 1.6 Utilize strengths of individuals to develop others in the group and incorporate the sharing of knowledge in group/process activities |
| 2 | Contribute to the flow of information and ideas | 2.1 Enhance work outcomes by sharing information and ideas relevant to the work activity with others |
| | | 2.2 Provide timely and relevant information to others |
| | | 2.3 Seek information and ideas to assist in the achievement of work requirements from appropriate persons when required |
| | | 2.4 Record information in the specified format in accordance to workplace procedures |

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| | 2.5 | Maintain and file relevant work information for easy retrieval |
| | 2.6 | Identify language and culture differences in communication and account for their impact on the work processes |
| 3 | Deal effectively with issues, problems and conflicts | |
| | 3.1 | Identify and assess issues, problems and conflicts encountered in the work place |
| | 3.2 | Discuss with team members issues, problems and conflicts and suggest solutions or refer to relevant authority |

RANGE STATEMENT

Working with others includes:

- one to one communication in a group or team
- taking part in informal discussions
- following instructions
- consulting with internal and external customers
- taking part in meetings
- dealing with conflict

Groups include:

- established or ad hoc work units
- diving team
- task forces
- committees
- self-directed teams

Working with others requires individual diversity to be taken into account include:

- cultural racial and ethnic background
- physical requirements
- gender
- languages
- customs
- religious and traditional beliefs

Techniques include:

- problem solving
- negotiation
- conflict resolution
- use of a mediator or conciliator

Work requirements include:

- goals
- objectives
- priorities
- specified targets or results
- time frames
- coordination with other work processes
- clear role definitions
- application of particular procedures
- organisation of work materials
- roster arrangements or particular approaches
- to work processes specified by the organisation or work group
- pre and post dive briefings

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. what are the individual roles, responsibilities and relationships to others
2. what are the techniques for managing work load such as meeting deadlines
3. what are the appropriate standards for personal presentation and hygiene

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

Evidence should include a demonstrated ability to:

- apply team work principles to one's own job role
- communicate effectively with others
- manage own work
- apply listening and questioning skills

- maintain an orderly workplace
- work harmoniously with others

(2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

(3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00007: Perform Underwater Work using SCUBA

Unit Descriptor:

This unit deals with the skills and knowledge required to carry out commercial diving using SCUBA equipment

ELEMENTS**PERFORMANCE CRITERIA**

Candidates must be able to:

1	Introduce self-contained underwater breathing apparatus (SCUBA)	1.1	Communicate and receive instructions from instructor/supervisor
		1.2	Carry out pre safety checks on SCUBA equipment
		1.3	Recap signals to be used with instructor/supervisor
		1.4	Assemble SCUBA and dress in accordance with company policies
		1.5	Establish weighting in pairs and enter water
		1.6	Adjust weighting until neutral at the surface with vented buoyancy
		1.7	Carry out mask and regular clearing exercises in accordance with workplace policy
		1.8	Use regulator for breathing
		1.9	Correct ascent rate, remove and pass weights, exit and undress
		1.10	Debrief and discuss assigned task with instructor
		1.11	Carry out post dive care and maintenance in accordance with company procedures and industry standards
2	Introduce lifeline communication signals	2.1	Set up dive station, flag Alpha, ladder and locate O2 kit
		2.2	Carry out pre dive safety checks

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| | 2.3 | Perform simple search on lifeline using basic signals |
| | 2.4 | Perform direction signals and act as a tender |
| | 2.5 | Respond to 4 pulls, ascend at the correct rate and safely egress |
| | 2.6 | Carry out post dive equipment care and maintenance in accordance with company procedures and industry standards |
| 3 | Perform basic rescue techniques | |
| | 3.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | 3.2 | Carry out self rescue techniques in accordance with company policies |
| | 3.3 | Make necessary signals and descend |
| | 3.4 | Disconnect/reconnect B.C quick connect and repeat for companion, |
| | 3.5 | Recover lost mouthpiece, clear fully flooded mask and use quick release of weights at surface in accordance with industry practices |
| | 3.6 | Carry out post dive equipment care and maintenance in accordance with company and industry standards |
| | 3.7 | Discuss and debrief assigned task with instructor |
| 4 | Act and deploy as standby diver | |
| | 4.1 | Communicate with instructor and receive instructions/task |
| | 4.2 | Perform duties of a stand by diver |
| | 4.3 | Ascend at the correct rate following company policies and industry standards |
| | 4.4 | Perform simulated rescue/recovery of a stricken/distressed diver |
| 5 | Act as standby diver tender | |
| | 5.1 | Tend to standby diver in the water |
| | 5.2 | Respond and act to all signals given by diver or instructor/supervisor |

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| | | 5.3 | Manage divers lifelines and work space following company policy and industry standards |
| | | 5.4 | Guide standby diver as necessary to the designated target |
| | | 5.5 | Handle high pressure SCUBA cylinders to industry safety standards |
| 6 | Perform rescue and contingency skills | 6.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 6.2 | Carry out pre dive safety checks and recap briefing with instructor |
| | | 6.3 | Follow procedures to buddy breathe with companion diver |
| | | 6.4 | Receive and interpret rescue signals from client /supervisor |
| | | 6.5 | Make contact with diver and perform rescue procedures and emergency evacuation in accordance with company policies |
| | | 6.6 | Carry out post dive care and maintenance in accordance with company and industry standards |
| | | 6.7 | Debrief and discuss assigned task with instructor |
| 7 | Perform lifeline signals and search techniques | 7.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 7.2 | Carry out pre dive safety checks and recap briefing with instructor |
| | | 7.3 | Carry out simple search task to safe endurance of SCUBA unit |
| | | 7.4 | Carry out simulated staged compression exercises using a lazy shot |
| | | 7.5 | Carry out post dive care and maintenance in accordance with company and industry standards |
| | | 7.6 | Debrief and discuss assigned task with supervisor |
| 8 | Use basic hand tools | 8.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |

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| | 8.2 | Carry out pre dive safety checks and recap briefing with instructor | |
| | 8.3 | Identify and select appropriate tools for assigned task | |
| | 8.4 | Perform task using hand tools at depth not exceeding 30 Meters Sea water. | |
| | 8.5 | Break down dive station and carry out post dive equipment care and maintenance in accordance with company policies | |
| | 8.6 | Debrief and discuss assigned task with supervisor | |
| 9 | Perform underwater surveys and measurements | 9.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 9.2 | Carry out pre dive safety checks and recap briefing with supervisor |
| | | 9.3 | Perform compass swim to endurance of SCUBA unit |
| | | 9.4 | Carry out measurements using appropriate tools |
| | | 9.5 | Carry out decompression exercise using appropriate equipment, signals and protocol |
| | | 9.6 | Break down dive station and carry out post dive equipment care and maintenance |
| | | 9.7 | Debrief and discuss assigned task with supervisor |
| | | 9.8 | Report verbally and transcribe information to supervisor/client |
| 10 | Charge SCUBA | 10.1 | Select and dress in appropriate personal protective wear |
| | | 10.2 | Prepare compressor for charging SCUBA |
| | | 10.3 | Charge SCUBA to working pressure and store in accordance with workplace procedures |
| | | 10.4 | Maintain machinery log book in accordance with company procedures |
| 11 | Navigate and manoeuvre small | 11.1 | Communicate with instructor and recap briefing boats |

boats	11.2	Carry out pre maintenance checks on small boat for sea worthiness
	11.3	Ensure minimum equipment is available and on board
	11.4	Carry out berthing procedures
	11.5	Navigate and manoeuvre a small boat in accordance with assigned task
	11.6	Carry out post operation equipment care and maintenance
	11.7	Debrief and discuss assigned task with supervisor

RANGE STATEMENT

Rescue skills include:

- recovery of a diver unable to help themselves at surface not less than 50 meters from dive station
- recovery of diver unable to help themselves, submerged not less than 5 MSW
- connecting/disconnecting power inflator whip for companion
- releasing weights at surface for companion
- removal of SCUBA for companion at surface
- providing alternate air source for companion submerged
- using distress signals
- applying procedure for lost contact with companion

Self-rescue skills include:

- releasing weights at surface
- inflation of buoyancy device at surface Orally and using inflation valve
- connecting /disconnecting power inflation whip
- maintaining correct ascent rate
- using distress signal
- applying procedures for lost contact with companion

Industry standards include:

- industry
- company

Stand by diver includes:

- immediate notice standby diver (diver fully dressed at the access point)
- short notice standby diver (diver with equipment ready and close at hand)
- as in -water standby diver (diver fully dressed and in the water)

Minimum small boats equipment includes:

- In date hand flares
- an anchor and rode
- a bailer
- paddles
- potable water
- a sound signaling device
- first aid kit
- VHF radio
- engine tools and spares
- life jackets for all crew

Basic hand tools include:

- saws
- hammers
- cold chisel
- wrenches
- measuring tape
- calipers
- pliers
- cutters
- pry bar
- chain hoist
- block and tackle
- magnetic compass

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. what is the importance and use of simple hand tools
2. how to use basic communication signals
3. what is the importance, advantages/disadvantages of modern SCUBA and its limitations
4. what are the basic components of SCUBA

5. what are the importance and correct use of ancillaries
6. what are the importance of fins and fining technique
7. what are the importance and use of thermal protection for different water temperatures
8. what are the importance and use of divers lifeline, swim float, compass and time piece
9. what are the importance and use of divers harness
10. what are the importance of pre and post dive equipment checks
11. what are the importance of divers weighting systems
12. what are the importance and use of buoyancy compensator
13. what are the importance and use of rescue techniques
14. how to interpret and apply decompression tables
15. what are the national and international legislations relating to the Limitations on the use of SCUBA

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

Evidence should include a demonstrated ability to:

- assemble SCUBA and dress
- perform mask and regulator clearing exercises
- use a divers Shot
- maintain decompression stop depth
- maintain predetermined working depth
- operate a divers reserve system
- use basic single lifeline codes
- charge SCUBA
- use simple hand tools underwater
- conduct a simple underwater search
- conduct a simple underwater survey
- perform simulated rescue
- prepare/ inventory safety equipment for small boat
- use basic hand signals
- log a minimum of 1000 in water training minutes using SCUBA, 300 of which are between 20 and 30 meters sea water.
- complete minimum 200 contact hours
- use voice communications
- use full face mask
- complete a set task at 30 meters sea water
- safely manoeuvre a small boat
- use basic rigging techniques ,bends and hitches

(2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

(3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00008 Perform Underwater Work using Surface Demand Diving Equipment no Deeper than 30 Meters

Unit Descriptor:

This unit deals with the skills and knowledge required to carry out commercial diving using surface demand diving equipment

ELEMENTS

PERFORMANCE CRITERIA

Candidates must be able to:

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|---|--|-----|---|
| 1 | Select and employ surface demand diving equipment (SDDE) | 1.1 | Communicate and receive instructions from instructor |
| | | 1.2 | Carry out pre safety checks on equipment in accordance with company procedures and industry standards |
| | | 1.3 | Recap signals to be used with instructor |
| | | 1.4 | Use surface demand equipment to carry out assigned tasks |
| | | 1.5 | Debrief and discuss assigned task with instructor |
| | | 1.6 | Carry out post dive care and maintenance in accordance with company procedures and industry standards |
| 2 | Introduce hard wire voice communication | 2.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 2.2 | Carry out pre dive safety checks in accordance with company procedures |
| | | 2.3 | Perform simple search on divers umbilical using hardwire voice communication |
| | | 2.4 | Perform direction signals and act as a tender |
| | | 2.5 | Respond to supervisor, ascend and safely egress |

MM00008 Perform Underwater Work using Surface Demand Diving Equipment no Deeper than 30 Meters

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| | 2.6 | Carry out post dive equipment care and maintenance in accordance with company procedures and industry standards |
| 3 | Use bailout manifold | |
| | 3.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | 3.2 | Identify main supply failure and operate reserve manifold |
| | 3.3 | Make necessary signals and descend |
| | 3.4 | Carry out post dive equipment care and maintenance in accordance with company and industry standards |
| | 3.5 | Discuss and debrief assigned task with instructor |
| 4 | Act and deploy as standby diver using SDDE | |
| | 4.1 | Communicate with instructor and receive instructions/task |
| | 4.2 | Perform duties of a standby diver |
| | 4.3 | Deploy and make contact with working diver using appropriate voice communications |
| 5 | Act as standby diver tender using SDDE | |
| | 5.1 | Tend to standby diver in the water |
| | 5.2 | Respond and act to all signals given by diver/ instructor |
| | 5.3 | Manage divers lifelines and work space following industry standards |
| | 5.4 | Handle high pressure SCUBA cylinders to industry and safety standards |
| 6 | Perform rescue and contingency skills | |
| | 6.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | 6.2 | Carry out pre dive safety checks and recap briefing with instructor |
| | 6.3 | Dress and perform stricken diver duties to 5 meters sea water |
| | 6.4 | Carry out post dive care and maintenance in accordance with company and industry standards |

MM00008 Perform Underwater Work using Surface Demand Diving Equipment no Deeper than 30 Meters

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| | 6.5 | Debrief and discuss assigned task with instructor |
| 7 | Perform survey techniques | 7.1 Set up station, flag Alpha, ladder and located O2 kit |
| | 7.2 | Carry out pre dive safety checks and recap briefing with instructor |
| | 7.3 | Carry out assigned search tasks using SDDE |
| | 7.4 | Carry out survey task incorporating video camera using SDDE and operate reserve manifold |
| | 7.5 | Carry out simulative staged compression incorporating a lazy shot |
| | 7.6 | Carry out post dive care and maintenance in accordance with company and industry standards |
| | 7.7 | Debrief and discuss assigned task with instructor |
| 8 | Use power tools | 8.1 Set up dive station, flag Alpha ,ladder and locate O2 kit |
| | 8.2 | Carry out pre dive safety checks and recap briefing with instructor |
| | 8.3 | Receive and interpret voice communication from client/supervisor |
| | 8.4 | Prepare hydraulic/pneumatic plant and tools for the assigned task |
| | 8.5 | Use the appropriate tools to perform assigned tasks |
| | 8.6 | Carry out post dive care and maintenance in accordance with company and industry standards |
| | 8.7 | Debrief and discuss assigned task with instructor |
| 9 | Perform underwater surveys and measurements | 9.1 Set up dive station, flag Alpha, ladder and locate O2 kit |

MM00008 Perform Underwater Work using Surface Demand Diving Equipment no Deeper than 30 Meters

- 9.2 Carry out pre dive safety checks and recap briefing with instructor
- 9.3 Perform survey using SDDE
- 9.4 Carry out measurements using appropriate tools in accordance with assigned task
- 9.5 Break down dive station and carry out post dive equipment care and maintenance
- 9.6 Carry out simulative staged compression using appropriate equipment, signals and protocol
- 9.7 Debrief and discuss assigned task with instructor
- 9.8 Report verbally and transcribe information to supervisor/client
- 10 Charge SCUBA/ H.P cylinders
 - 10.1 Prepare compressor for charging SCUBA or high pressure cylinders
 - 10.2 Charge SCUBA to working pressure of cylinder in use and store in accordance to industry standards
 - 10.3 Maintain machinery log book
- 11 Use free flow helmet
 - 11.1 Set up dive station flag Alpha ,ladder and locate O2 kit
 - 11.2 Dress and perform diver readout and stride entry in free flow helmet
 - 11.3 Receive and interpret voice communication from client/supervisor
 - 11.4 Complete assigned task at 12 meters sea water or greater
 - 11.5 Carry out post dive care and maintenance in accordance with company and industry standards
 - 11.6 Debrief and discuss assigned task with instructor

MM00008 Perform Underwater Work using Surface Demand Diving Equipment no Deeper than 30 Meters

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| 12 | Perform deep dive to assigned depth | 12.1 | Set up dive station, flag Alpha ladder and locate O2 kit |
| | | 12.2 | Dress and perform diver readout and stride entry in Demand helmet |
| | | 12.3 | Receive and interpret voice communication from client/supervisor |
| | | 12.4 | Complete assigned task at 25 (MSW) Metres sea water or greater |
| | | 12.5 | Carry out stage compression using appropriate equipment |
| | | 12.6 | Carry out post dive care and maintenance in accordance with company and industry standards |
| 13 | Perform panel operations | 13.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 13.2 | Perform panel operations in accordance with company procedures |
| | | 13.3 | Carry out post dive care and maintenance in accordance with company and industry standards |
| | | 13.4 | Debrief and discuss assigned task with instructor |
| 14 | Prepare and operate a surface decompression chamber | 14.1 | Inspect surface compression chamber and plant to ensure suitability for use |
| | | 14.2 | Prepare surface compression chamber for use in accordance with company policy and industry standards |
| | | 14.3 | Operate surface compression chamber in accordance with workplace procedures |
| | | 14.4 | Carry out post dive care and maintenance of chamber in accordance with company and industry standards |
| | | 14.5 | Debrief and discuss assigned task with instructor |

RANGE STATEMENT

Power/hydraulic/ pneumatic tools include:

- drill
- saw
- socket wrench
- suction dredge
- jetting tool
- welding equipment
- oxy-arc cutting equipment
- grinder

Panel operations include:

- monitor working diver's air supply and time
- monitor worker's depth and panel instruments
- operating divers secondary supply
- pass and receive effective voice communications

Appropriate equipment includes:

- shot
- lazy shot

Assigned task includes:

- mechanical
- bolted
- video survey
- area search
- simulated rescue

Surface Demand Diving Equipment includes:

- surface demand diving equipment
- free flow and demand helmets
- high and low pressure supply systems

Company policy includes:

- procedural Check lists
- Trinidad Standard CDTTS 539:20XX Commercial Diving Operations

Panel operations include:

- monitoring main and reserve air supplies
- monitoring and recording dive profile
- calculating divers decompression obligation
- relaying information to tenders and crew
- relaying and receiving information from diver
- operating divers reserve supply

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. how to use hardwire voice communications
2. what are the eight principal knots and purpose of each knot
3. what is the importance, advantages/disadvantages of modern SDDE and its limitations
4. national and international legislation relating to surface supplied diving
5. what are the basic components of SDDE
6. what is the importance and use of surface decompression chambers
7. what is the importance of divers bailout supply
8. what is the importance and use of thermal protection for different water temperatures
9. what is the importance and use of divers' umbilical
10. what is the importance and use of divers' harness
11. what is the importance of pre and post dive equipment checks
12. what is the importance of divers' weighting systems
13. what is the importance and use of power tools underwater
14. what is the importance and use of therapeutic decompression tables

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

Evidence should include a demonstrated ability to:

- assemble SDDE and dress
- perform emergency bailout exercises
- use hardwire voice communications
- prepare a surface compression chamber for use
- operate a surface compression chamber
- use power tools for cutting, cleaning, dredging, assembling or welding
- operate a divers air supply panel
- perform a set task in water deeper than 25 Meters Sea Water
- Log a minimum of 1000 in water training minutes 120 of which are distributed between 20 and 30 MSW during 25 Dives in varying conditions.
- complete 200 contact hours
- deploy as standby diver and recover diver in an emergency

(2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency .The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

(3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00009 Perform Underwater Work using Surface Demand Diving Equipment to 50 Meters Incorporating Wet Bell

MM00009: Perform Underwater Work using Surface Demand Diving Equipment to 50 Meters Incorporating Wet Bell

Unit Descriptor:

This unit deals with the skills and knowledge required to carry out commercial diving using surface demand diving equipment to 50 meters incorporating wet bell.

ELEMENTS

PERFORMANCE CRITERIA

Candidates must be able to:

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|---|--|-----|---|
| 1 | Select and employ surface demand diving equipment (SDDE) | 1.1 | Communicate and receive instructions from instructor |
| | | 1.2 | Carry out pre safety checks on equipment |
| | | 1.3 | Recap with the instructor signals to be used |
| | | 1.4 | Communicate and receive instructions from instructor |
| | | 1.5 | Carry out pre safety checks on equipment |
| | | 1.6 | Use SDDE to carry out assigned tasks |
| | | 1.7 | Debrief and discuss assigned task with instructor |
| | | 1.8 | Carry out post dive care and maintenance in accordance with company procedures and industry standards |
| 2 | Use wet bell | 2.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 2.2 | Carry out pre dive safety checks |
| | | 2.3 | Perform simple search on divers umbilical using hardwire voice communication at a depth of 18 MSW deploying from a wet bell |

MM00009 Perform Underwater Work using Surface Demand Diving Equipment to 50 Meters Incorporating Wet Bell

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| | | 2.4 | Carry out post dive equipment care and maintenance in accordance with company procedures and industry standards |
| 3 | Perform surface oxygen decompression | 3.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 3.2 | Follow procedures to perform surface oxygen decompression |
| | | 3.3 | Carry out post dive equipment care and maintenance in accordance with company and industry standards |
| | | 3.4 | Discuss and debrief assigned task with instructor |
| 4 | Act as chamber operator | 4.1 | Communicate with instructor and receive instructions |
| | | 4.2 | Operate surface compression chamber in accordance with workplace procedures |
| 5 | Act as tender to diver in deep water | 5.1 | Tend to diver in the water |
| | | 5.2 | Respond and act to all signals given by diver/ instructor |
| | | 5.3 | Manage divers umbilical lines and work space following industry standards |
| 6 | Perform rescue and contingency skills | 6.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 6.2 | Carry out pre dive safety checks and recap briefing with instructor |
| | | 6.3 | Dress and perform dive readout and stride entry in SDDE (Helmet) to 5 meters sea water |
| | | 6.4 | Receive and interpret voice communication from client/supervisor |
| | | 6.5 | Deploy as immediate notice standby diver |

MM00009 Perform Underwater Work using Surface Demand Diving Equipment to 50 Meters Incorporating Wet Bell

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| | 6.6 | Make contact with working diver and perform SDDE rescue procedures and emergency evacuation in accordance with company policy | |
| | 6.7 | Carry out post dive care and maintenance in accordance with company and industry standards | |
| | 6.8 | Debrief and discuss assigned task with instructor | |
| 7 | Perform cutting and welding underwater | 7.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 7.2 | Dress and perform diver readout and stride entry in SDDE |
| | | 7.3 | Receive and interpret voice communication from client/supervisor |
| | | 7.4 | Prepare cutting/welding plant and tools for the assigned task |
| | | 7.5 | Use selected cutting tool to complete assigned task |
| | | 7.6 | Carry out post dive care and maintenance in accordance with company and industry standards |
| | | 7.7 | Debrief and discuss assigned task with instructor |
| 8 | Dive to 40 meters of sea water (MSD) | 8.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 8.2 | Dress and perform diver readout and stride entry in Demand helmet |
| | | 8.3 | Receive and interpret voice communication from client/supervisor |
| | | 8.4 | Complete assigned task at no less than 40 meters sea water |
| | | 8.5 | Carry out post dive care and maintenance in accordance with company and industry standards |
| | | 8.6 | Debrief and discuss assigned task with instructor |

MM00009 Perform Underwater Work using Surface Demand Diving Equipment to 50 Meters Incorporating Wet Bell

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|----|---|------|---|
| 9 | Use underwater close circuit television (CCTV) | 9.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 9.2 | Dress and perform diver readout and stride entry in SDDE |
| | | 9.3 | Receive and interpret voice communication from client/supervisor |
| | | 9.4 | Prepare CCTV equipment for underwater inspection |
| | | 9.5 | Complete a CCTV inspection task at 5 meters sea water or greater |
| 10 | Perform deep dive to assigned depth | 10.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 10.2 | Dress and perform diver readout and stride entry in demand mask or helmet |
| | | 10.3 | Receive and interpret voice communication from client/supervisor |
| | | 10.4 | Complete assigned task at the appropriate depth no greater than 50 Meters sea water |
| | | 10.5 | Carry out stage compression using appropriate equipment |
| | | 10.6 | Carry out post dive care and maintenance in accordance with company and industry standards |
| 11 | Perform panel operations | 11.1 | Set up dive station, flag Alpha, ladder and locate O2 kit |
| | | 11.2 | Perform panel operations |
| | | 11.3 | Carry out post dive care and maintenance in accordance with company and industry standards |
| | | 11.4 | Debrief and discuss assigned task with instructor |
| 12 | Prepare and operate a surface decompression chamber | 12.1 | Inspect surface compression chamber and plant to ensure suitability for use |
| | | 12.2 | Prepare surface compression chamber for use in accordance company policy and industry standards |

- 12.3 Operate surface compression chamber in accordance with workplace procedures
- 12.4 Carry out post dive care and maintenance of chamber in accordance with company and industry standards
- 12.5 Debrief and discuss assigned task with instructor

RANGE STATEMENT

Surface Demand Diving Equipment includes:

- surface demand diving equipment
- free flow helmet
- Umbilical bundle
- High and low pressure compressors
- High pressure storage banks
- Twin lock surface compression chamber

Appropriate equipment includes:

- shot
- lazy shot
- Wet bell
- Divers stage

Power/hydraulic/ pneumatic tools include:

- grinder
- brush
- drill
- saw
- socket wrench
- suction dredge
- jetting tool
- welding equipment
- oxy-arc cutting equipment

Assigned task includes:

- mechanical
- bolted
- video survey
- search
- use of hydraulic/pneumatic tool
- oxy arc cutting
- welding

Panel operations include:

- monitoring main and reserve air supplies
- monitoring and recording dive profile
- calculating divers decompression obligation
- relaying information to tenders and crew
- relaying and receiving information from diver
- operating divers reserve supply

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. how to use hardwire voice communications
2. what are the different knots and purpose of each knot
3. what is the importance, advantages/disadvantages of modern SDDE and its limitations
4. what are the basic components of SDDE
5. what is the importance and use of surface compression chambers
6. what is the importance of divers bailout supply
7. What is the application of a wet bell
8. the importance and placement of non-return valves in SSDE
9. what is the importance and use of thermal protection for different water temperatures
10. what is the importance and use of divers Umbilical
11. what is the importance and use of divers harness
12. what is the importance of pre and post dive equipment checks

13. what is the importance of divers weighting systems
14. what is the importance and use of power tools underwater
15. what is the importance and use of Therapeutic decompression tables
16. how to apply oxy arc cutting equipment

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

Evidence should include a demonstrated ability to:

- assemble SDDE and dress
- check non return valve of helmet or mask
- perform emergency bailout exercises
- use hardwire voice communications
- use divers shot line
- deploy from a wet bell as diver and bellman
- carry out a set task at 45 – 50 MSW
- prepare a surface compression chamber for use
- operate a Decompression Chamber
- follow procedures for surface Oxygen Decompression
- identify and respond to a diver suffering from Decompression illness
- deploy as standby diver and assist in the recovery of diver in the event of an emergency
- log 1200 in water training minutes in no less than 25 dives,400 minutes of which show distribution between30 MSW and 50 MSW using surface supplied equipment
- complete 200 course contact hours minimum
- use power tools for cutting, cleaning, dredging, assembling or welding
- operate a divers air supply panel
- complete a set task in water deeper than 40 meters Sea water

(2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

(3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00010

Use Power Tools

Unit Descriptor:

This unit deals with the skills and knowledge required to select and use appropriate power tools of commercial diving and applies to individuals in the diving industry

ELEMENTS**PERFORMANCE CRITERIA**

Candidates must be able to:

1	Identify and select power tools	1.1	Communicate and receive instructions from instructor
		1.2	Identify and select power tools for the assigned task
		1.3	Check to ensure all power tools are in a safe and usable condition
2	Prepare power tools for use	2.1	Carry out the necessary preparations to the power tools in line with work requirements
		2.2	Make sure all required safety arrangements are in place to protect oneself and others
		2.3	Report completion of preparations in accordance with company procedures
		2.4	Deal promptly with problems within your control and report those that cannot be solved
3	Establish power supply to work location	3.1	Identify route for safe placement of leads/hoses clear of hazards
		3.2	Cover and support where necessary all power supply if presenting any possible hazards
4	Use power tools	4.1	Locate material and hold in position for power tool application
		4.2	Use power tools safely and effectively in accordance with intended use

- 4.3 Store power tools safely when not in use
- 5 Clean up
 - 5.1 Clean power tools and store in accordance with company policy
 - 5.2 Clean work area and remove waste

RANGE STATEMENT

Power supply includes:

- electricity
- compressed air
- hydraulics

Power tools include:

- drills
- oxy-arc cutting equipment
- hydraulic wrenches
- screwdrivers
- pneumatic suction dredge
- hydraulic grinder

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. what are the workplace and equipment safety requirements
2. what power tools are to be used for assigned tasks
3. how to prepare power tools for use
4. what are the care and control procedures for power tools

EVIDENCE GUIDE**1) Critical Aspects of Evidence**

Evidence should include a demonstrated ability to:

- work safely to instructions
- handle/hold materials during operation of tools
- select appropriate tools for material usage
- communicate effectively with co workers

2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00011: Use Hand tools

Unit Descriptor:

This unit deals with the skills and knowledge required to select and use appropriate hand tools of commercial diving and applies to individuals in the diving industry

ELEMENTS**PERFORMANCE CRITERIA**

Candidates must be able to:

- | | | | |
|---|--------------------------------|-----|--|
| 1 | Identify and select hand tools | 1.1 | Communicate and receive instructions from instructor |
| | | 1.2 | Identify and select hand tools for the assigned task |
| | | 1.3 | Check to ensure all hand tools are in a safe and usable condition |
| 2 | Prepare hand tools for use | 2.1 | Carry out the necessary preparations to the hand tools in line with work requirements |
| | | 2.2 | Make sure all required safety arrangements are in place to protect oneself and others |
| | | 2.3 | Report completion of preparations in accordance with company procedures |
| | | 2.4 | Deal promptly with problems within your control and report those that cannot be solved |
| 3 | Use hand tools | 3.1 | Locate material and hold in position for hand tool application |
| | | 3.2 | Use hand tools safely and effectively in accordance with intended use |
| | | 3.3 | Store hand tools safely when not in use |
| 4 | Clean up | 4.1 | Clean hand tools and store in accordance with company policy |
| | | 4.2 | Clean work area and remove waste |

RANGE STATEMENT

Hand tools include:

- hammers
- cold Chisels
- saws
- screwdrivers
- punches
- chain Hoists
- turfors
- come alongs
- callipers
- measuring tapes
- hand Compass
- tackles

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

- 1 what are the workplace and equipment safety requirements
- 2 what hand tools are to be used for assigned tasks
- 3 how to prepare hand tools for use
- 4 what are the care and control procedures for hand tools

EVIDENCE GUIDE**1. Critical Aspects of Evidence**

Evidence should include a demonstrated ability to:

- work safely to instructions
- handle/hold materials during operation of tools
- select appropriate tools for material usage
- communicate effectively with co workers
- rig a simple purchase
- use a force multiplier

2. Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

3. Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00012: Carry out Measurements and Calculations

Unit Descriptor:

This unit deals with the skills and knowledge required to effectively carry out measurements and calculation so work to required tolerance and applies to individuals working in the diving industry

ELEMENTS

PERFORMANCE CRITERIA

Candidates must be able to:

1	Obtain measurements	1.1	Communicate and receive instructions from instructor
		1.2	Obtain measurements for assigned task using the appropriate tool/s
		1.3	Recognise and adhere to all quality assurance requirements associated with commercial diving operations
2	Perform Calculations	2.1	Carry out calculations involving length, perimeter mass, pressure, volume and Buoyancy using the basic operations
		2.2	Carry out calculations for No decompression limits, ascent, descent and bottom time, stop time, minimum surface interval, no Fly intervals and diving at altitude using Industry approved decompression tables.
3	Estimate appropriate quantities	3.1	Estimate safe working load on natural and synthetic fibre ropes and shackles
		3.2	Calculate mechanical advantage and velocity ratio for a block and tackle purchase.
		3.3	Calculate and record quantity of suitable material in accordance with assigned task
		3.4	Estimate air endurance/consumption at depth

RANGE STATEMENT

Appropriate tools include :

- rule
- tape
- square
- electronic calculator

Basic operations include:

- subtraction
- addition
- multiplication
- division
- transposition of simple formulae

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. how to perform basic operations in geometry, measurement and calculations
2. how to read and interpret drawings and specifications
3. how to calculate partial pressure, Percentage and absolute pressure of a gas mixture using Daltons law
4. how to calculate pressure /volume using Boyles law
5. the relationship between temperature and pressure and volume
6. how to calculate buoyancy using archimedes principle
7. the basic principle of gas absorption in a liquid according to Daltons Law
8. how the behaviour of light, heat and sound relates to diving
9. how to calculate absolute and gauge pressure applied to diving
10. how forces are transmitted through a fluid (Pascals law)
11. how to calculate air endurance using different consumption rates
12. how to calculate decompression obligation using tables

13. how to calculate safe working Load of commonly used lines and rigging

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

Evidence should include a demonstrated ability to:

- read and interpret drawings
- record measurements
- Use decompression Tables
- Use Diving related formulae
- Estimate Air endurance of SCUBA unit according to depth and RMV
- Calculate Safe Working Load of Lines and Tackle
- Estimate Mechanical advantage of a Tackle
- operate electronic calculating devices
- communicate effectively

(2) Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

(3) Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams

MM00013:

Prepare and Operate Manual Metal Arc Welding Equipment

Unit Descriptor:

This unit deals with the skills and knowledge required to prepare and operate manual metal arc welding equipment in a marine environment in accordance with instructions and or approved welding procedures.

ELEMENTS

Candidates must be able to:

PERFORMANCE CRITERIA

1	Prepare for manual metal arc welding process	1.1	Obtain the appropriate equipment for the welding activities to be carried out
		1.2	Check the condition and connect welding leads earthing arrangements and electrode holder
		1.3	Set and adjust welding conditions/parameters in accordance with welding procedure specification
		1.4	Prepare the work area for the welding activities
		1.5	Set up and secure workplace for specified joint preparation
		1.6	Obtain and wear appropriate personal protective equipment
2	Operate manual metal arc welding equipment	2.1	Use manual metal arc welding and related equipment to produce welded joints incorporating fillet and butt welds
		2.2	Use manual metal arc welding and related equipment to produce joints in the specified material form
3	Join marine materials/structures using manual metal arc welding process	3.1	Obtain the appropriate material for the welding activities to be carried out
		3.2	Follow the relevant joining procedure and job instructions
		3.3	Check that joining preparation complies with specification

- 3.4 Check that joining and related equipment and consumables are as specified and fit for purpose
- 3.5 Make the joints using the appropriate thermal joining technique to specifications
- 3.6 Produce joints of the required quality and of specified dimensional accuracy
- 3.7 Deal promptly with excess and waste materials and temporary attachments in line with approved and agreed procedures

RANGE STATEMENT

Welding activities include:

- sitting welding screens
- positioning fume extraction equipment

Specified material form includes:

- plate
- pipe
- tube
- section

UNDERPINNING KNOWLEDGE & SKILLS

Candidates must know:

1. what are the safe working practices and procedures to be observed when working with manual metal arc equipment
2. what is the manual metal arc process
3. how to set up and restrain a joint

4. what are the different techniques for operating welding equipment to produce a range of joints in various joint positions

EVIDENCE GUIDE

1. Critical Aspects of Evidence

Evidence should include a demonstrated ability to:

- set up and restrain a joint
- join marine materials/structures using manual metal arc welding process
- operate manual metal arc welding equipment

2. Method of Assessment

Assessors should gather a range of evidence, over a period of time, which is valid, sufficient and authentic. Evidence should be gathered through a variety of ways including direct observation and oral questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, manufacturer's specifications, codes, standards, manuals and reference materials

3. Context of Assessment

This unit may be assessed on the job or off the job. Where assessment is done off the job, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by working in teams.