Technical and Vocational Education and Training Authority

National Competency Standard for Water Plant Operator

Standard Code: CONS03V1/21

Developed in partnership with: Ministry of Environment

GREEN CLIMATE FUND

Qualification Name: National Certificate IV in Water Supply System Operation and Maintenance
Qualification Code: CONS03Q2L4V1/21

PREFACE

Technical and Vocational Education and Training (TVET) Authority was established with the vision to develop a TVET system in the Maldives that is demand driven, accessible, beneficiary financed and quality assured, to meet the needs of society for stability and economic growth, the needs of Enterprise for a skilled and reliable workforce, the need of young people for decent jobs and the needs of workers for continuous mastery of new technology.

TVET system in the Maldives flourished with the Employment Skills Training Project (ESTP) funded by ADB with the objective of increasing the number of Maldivians, actively participating in the labor force, employed and self-employed. The Project supported expansion of demand driven employment-oriented skills training in priority occupations and to improve the capacity to develop and deliver Competency Based Skill Training (CBST). The project supported delivery of CBST programs to satisfy employer demand-driven needs. Currently CBST is offered for six key sectors in the Maldives: Tourism, Fisheries and Agriculture, Transport, Construction, Social and the Information and Technology sectors. These sectors are included as priority sectors that play a vital role in the continued economic growth of the country.

The National Competency Standards (NCS) provides the base for initiating the training in those topics. The NCS are endorsed by the Employment Sector Councils of the respective sectors and validated by the Maldives Qualification Authority. These NCS were developed in consultation with Employment Sector Councils representing employers. They were designed using a consensus format endorsed by the Maldives Qualifications Authority (MQA) to maintain uniformity of approach and the consistency of content amongst occupations. This single format also simplifies benchmarking the NCS against relevant regional and international standards. NCS specify the standards of performance of a competent worker and the various contexts in which the work may take place. NCS also describes the knowledge, skills and attitudes required in a particular occupation. They provide explicit advice to assessors and employers regarding the knowledge, skills and attitudes to be demonstrated by the candidates seeking formal recognition for the competency acquired following training or through work experience. By sharing this information, all participants in the training process have the same understanding of the training required and the standard to be reached for certification. Certification also becomes portable and can be recognized by other employers and in other countries with similar standards.

In an effort to accelerate the provision of water supply and sewerage services, the Government of Maldives has placed great emphasis towards increasing financial resources from the national budget and much needed institutional reforms in the water and sanitation sector. With the additional resource received from international development and donor agencies significant improvement have been made in the sector. The Government received a grant from Green Climate Fund (GCF) for the project which is being jointly implemented by the Government of Maldives and United Nations Development Programme (UNDP) to Support vulnerable communities in Maldives to manage climate change-induced water shortages.

An important aim of the project is to strengthen the management and institutional capacity of the Water and Sanitation Sector which ensures the sustainability of the water services implanted and contributes to the national policy goals and strategies related to sector capacity development. This is being achieved by encouraging and supporting local educational institutions to develop courses, conduct technical training and educational programs.

TVET Authority and the Ministry of Environment have signed a Memorandum of Understanding (MoU) to setup the National Competency standards for plumbing, water and sewerage system operations and utility laboratory services. The development of these Standards has been assigned to the Maldives Institution of Technology (MIT) with TVET authority reviewing and approving the material.

NCS are the foundation for the implementation of the TVET system in Maldives. They ensure that all skills, regardless of where or how they were developed can be assessed and recognized. They also form the foundation for certifying skills in the Maldives National Qualification Framework (MNQF).

It is with great pleasure we present these National Competency Standards (NCS) for plumbing, water and sewerage system operation and utility laboratory services, developed by the Ministry of Environment in coordination with the Ministry of Higher Education under the support of Green Climate Fund project "Supporting vulnerable communities in Maldives to manage climate change-induced water shortages".

Mohamed Hashim

Minister of State for Higher Education

TVET Authority

Ahmed Nisham

Quality Assurance Consultant

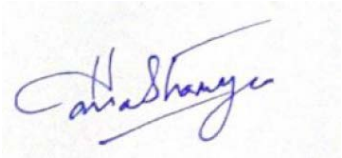
TVET Authority

TECHNICAL PANEL MEMBERS			
#	**Name**	**Designation**	**Organization**
01	Mohamed Siraj	Director	Ministry of National Planning, Housing and Infrastructure
02	Mohamed Fazeeh	Assistant Director	Ministry of Environment
03	Mohamed Ibrahim Jaleel	Assistant Director	Ministry of Environment
04	Adam Mubeen	Assistant Director	Utility Regulatory Authority
05	Ismail Ibrahim	Assistant General Manager	Male' Water and Sewerage Company
06	Ahmed Fathhee	Assistant Director	Housing Development Corporation
07	Hussain Shiyam	Civil Engineer	Association of Civil Engineers
08	Abdulla Hussain Rasheed	Executive Member	Association of Civil Engineers
09	Mohamed Saif Saeed		Association of Civil Engineers
10	Dr Yoosuf Nizam	Lecturer	Maldives National University
11	Mohamed Shaulan Sadiq	Engineer	FENAKA
12	Ali Shareef		STELCO

VERSION	DEVELOPER	DATE	STANDARD CODE
V1	Maldives Institute of Technology	15th February 2021	CONS03V1/21

EMPLOYMENT SECTOR COUNCILS			
#	**Name**	**Designation**	**Organization**
01	Hassan Shameem	Managing Director	INOCA Pvt Ltd
02	Mohamed Naseer	President	Contractors Association
03	Ismail Ameen	Professional Member	Architect Association of Maldives
04	Mohamed Musthafa	Director General	Ministry of Environment and Energy
05	Mohamed Rasheed	Assistant Director, Project Management and Development	Housing Development Corporation
06	Adnan Haleem	Secretary General	Maldives National Association of Construction Industry
07	Ahmed Musthaq	General Manager Engineering and Maintenance	Maldives Airports Company Limited
08	Ahmed Migdhad	Director	Ministry of Economic Development
09	Hussain Shiyam	Civil Engineer	Association of Civil Engineers
10	Mariyam Abdul Rahman	Director	Ministry of Youth, Sports and Community Empowerment
11	Ibrahim Shareef Hassan	Manager of Academic and Student Structure Board	Maldives Institute of Technology (MIT)
12	Mohamed Haikal Ibrahim	Head of Department Engineering	Maldives National University
13	Mohamed Shahud	Assistant Engineer	Ministry of National Planning
14	Muaz Ibrahim	Assistant Manager Projects	MWSC
15	Mohamed Waheed	Assistant Lecturer Grade 2	Maldives Polytechnic

National Occupational Standard has been endorsed by:

 Hassan Shameem Chairperson Construction Employment Sector Council	 Mohamed Naseer Vice-Chairperson Construction Employment Sector Council
Technical and Vocational Education and Training Authority Ministry of Higher Education Handhuvaree Hingun, M. World Dream Male', Maldives	
Date of Endorsement: 15th February 2021	Date of Revision: NA

Standard Development Process

To begin with, Water Supply System Operation and Maintenance occupations were profiled through study of relevant occupation across Maldivian workplaces. During the study, relevant occupations within the Utility Sector were reviewed including their job descriptions. In addition to that, international trends were also reviewed and that led to the development of this National Competency Standard for Water Supply System Operations and Maintenance.

Referred draft occupational standard is now ready to be submitted through TVETA to a team of Technical Panel (TP) selected from relevant Maldivian workplaces. Members of the TP will review and may recommend changes to the competency units mapped and selected. Purpose of this process is to develop a competency standard that reflects current work practices of today with provisions to cater for future growth across the utility enterprises of the Maldives. Technical Panel meetings will continue in reviewing this Competency Standard until Final Draft is agreed and accepted by all the participating members.

Final Draft of Water Supply System Operation and Maintenance Standard approved by the TP will then be submitted to the Construction Employment Sector Council (ESC) for endorsement and validation. A brief report on how the National Occupational Standard of Water supply system operations and Maintenance reflecting the process of compilation will be presented to the Construction Employment Sector Council together with the standard. Council members will further review and If ESC recommends any change, Consultant is required to bring those changes and once agreeable, Competency Standard on Water Supply System Operation and Maintenance will be endorsed by the Council.

With the endorsement from the Construction Employment Sector Council, final document of the National Occupational Standard of Water supply system operations and Maintenance will be submitted to the Maldives Qualification Authority (MQA) for final approval. With approval from MQA, the National Occupational Standard of Water Supply System Operation and Maintenance will be published on TVETA website, to be used by training providers in delivering training using these standards.

Description of "Water Plant Operator"

Water Plant Operators play an important role within the Public Utility Sector of the Maldives as they ensure smooth and effective operation and maintenance of the very expensive water treatment plants being installed across Maldives.

National Certificate IV in Water Supply System Operations and Maintenance is mapped and organized in such a way to ensure those competent in the referred qualification will have the knowledge and skills to contribute positively and work as Plant Technician.

Prospective Job opportunities

Upon successful completion of the National Certificate IV in Water Supply System Operations and Maintenance, students can work in the following jobs.

- Water Plant Technician
- Water Plant Operator

KEY FOR CODING

Coding Competency Standards and Related Materials

DESCRIPTION	REPRESENTED BY
Industry Sector as per ESC (Three letters)	Construction Sector (CON) Fisheries and Agriculture (FNA) Information, Communication and Technology (ICT) Transport Sector (TRN) Tourism Sector (TOU) Social Sector (SOC) Foundation (FOU)
Competency Standard	S
Occupation with in an industry sector	Two digits 01-99
Unit	U
Common Competency	CR
Core Competency	CM
Optional / Elective Competency	OP
Assessment Resources Materials	A
Learning Resources Materials	L
Curricular	C
Qualification	Q1, Q2 etc.
MNQF level of qualification	L1, L2, L3, L4 etc.
Version Number	V1, V2 etc.
Year of Last Review of standard, qualification	By "/" followed by two digits responding to the year of last review, example /21 for the year 2021

1. Endorsement Application for Qualification 02

2. NATIONAL CERTIFICATE IV IN WATER SUPPLY SYSTEM OPERATION AND MAINTENANCE

3. Qualification code: CONS03Q2L4V1/21	**Total Number of Credits: 124**

4. Purpose of the qualification

National Certificate IV in Water Supply System Operation and Maintenance provides comprehensive training for the water plant operators and technicians with up-to-date knowledge and skills related to smooth and effective operation and maintenance of water plants located across the islands and resorts.

5. Regulations for the qualification	National Certificate IV in Water Supply System Operation and Maintenance will be awarded to those who are competent in units 1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16+17+18+19

6. Schedule of Units

Unit No	Unit Title	Code
Common Competencies		
01	Write technical reports	CONCM08V1/21
02	Apply and maintain Occupational Health and Safety	CONCM09V1/21
03	Carry out data entry and retrieval procedures	CONCM10V1/21
04	Apply Mathematics for Water Operations	CONCM11V1/21
Core Competencies		
05	Prepare basic technical drawing	CONS03CR01V1/21
06	Plan to undertake a routine task	CONS03CR02V1/21
07	Apply science for Water Operations	CONS03CR03V1/21
08	Store fluids in bulk	CONS03CR04V1/21
09	Operate and monitor pneumatic systems and equipment	CONS03CR05V1/21
10	Operate process control systems	CONS03CR06V1/21
11	Monitor and operate water distribution systems	CONS03CR07V1/21
12	Conduct chlorine dosing of water at the point of supply	CONS03CR08V1/21
13	Perform sampling and testing of water	CONS03CR09V1/21
14	Operate and Maintain water production systems	CONS03CR10V1/21
15	Apply accident-emergency procedures	CONS03CR11V1/21
16	Trouble shooting of control systems	CONS03CR12V1/21
17	Apply sustainable and efficient operation	CONS03CR13V1/21
18	Perform Chemical Cleaning	CONS03CR14V1/21
19	Operate and maintain of power generation system (renewable energy)	CONS03CR15V1/21

7.Accreditation requirements	The training provider should place trainees in relevant industry or sector to provide the trainees the hands-on experience exposure related to this qualification.
8. Recommended sequencing of units	As appearing under the section 06

Units Details

#	Unit Title	Code	Level	No of credits
01	Write technical reports	CONCM08V1/21	IV	07
02	Apply and maintain Occupational Health and Safety	CONCM09V1/21	IV	10
03	Carry out data entry and retrieval procedures	CONCM10V1/21	IV	10
04	Apply Mathematics for Water Operations	CONCM11V1/21	IV	07
05	Prepare basic technical drawing	CONS03CR01V1/21	IV	05
06	Plan to undertake a routine task	CONS03CR02V1/21	IV	05
07	Apply science for Water Operations	CONS03CR03V1/21	IV	06
08	Store fluids in bulk	CONS03CR04V1/21	IV	05
09	Operate and monitor pneumatic systems and equipment	CONS03CR05V1/21	IV	07
10	Operate process control systems	CONS03CR06V1/21	IV	06
11	Monitor and operate water distribution systems	CONS03CR07V1/21	IV	06
12	Conduct chlorine dosing of water at the point of supply	CONS03CR08V1/21	IV	04
13	Perform sampling and testing of water	CONS03CR09V1/21	IV	05
14	Operate and Maintain water production systems	CONS03CR10V1/21	IV	10
15	Apply accident-emergency procedures	CONS03CR11V1/21	IV	06
16	Trouble shooting of control systems	CONS03CR12V1/21	IV	06
17	Apply sustainable and efficient operation	CONS03CR13V1/21	IV	07
18	Perform Chemical Cleaning	CONS03CR14V1/21	IV	05
19	Operate and maintain of power generation system (renewable energy)	CONS03CR15V1/21	IV	07

Packaging of National Qualifications:
National Certificate IV in Water Supply System Operation and Maintenance will be awarded to those who are competent in units 1+2+3+4+5+6+7+8+9+10+11+12+13+14+15+16+17+18+19

Qualification Code: CONS03Q2L4V1/21

UNIT TITLE	Write technical reports				
DESCRIPTOR	This unit covers the competence to identify and analyse requirements, to plan and conduct research, to evaluate information and findings, and to develop, document and present technical reports.				
CODE	CONCM08V1/21	LEVEL	IV	CREDIT	07

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Plan the research and write the proposal	1.1 Purpose or objective of the research is identified, and confirmed with stakeholders 1.2 Scope and nature of the information requirements are identified. 1.3 All possible sources of the required information are researched and identified. 1.4 A systematic research or information collection plan is designed to optimize the process. 1.5 Resources are obtained and scheduled to service the research requirements.
2. Conduct research	2.1 Research is undertaken effectively in accordance with the plan 2.2 Experiments and tests to support the research effort are conducted in a manner which ensures the demonstrable integrity of the outcomes or findings. 2.3 Research findings are logged, documented and stored to maintain traceability. 2.4 Preliminary analysis is conducted to identify requirements for variations or additions to the research plan.
3. Analyse the information	3.1 Information is sorted, documented and prepared for the analytical process. 3.2 Information and data are manipulated to enable reasonable comparisons and judgements. 3.3 Clarification by way of expert advice and opinion is sought.
4. Prepare and present the report	4.1 Report clearly defines the objectives, process, findings and further actions. 4.2 Report addresses and satisfies the stated objective and timeframe 4.3 Report and associated presentation materials are of a standard and quality for the intended audience 4.4 Reader comprehension of the report is aided by use of executive summaries and attachments. 4.5 Information management requirements, including documenting and repository actions are satisfied in accordance with enterprise procedures.

RANGE STATEMENT

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

Tools, equipment and material used in this unit may include:

For the purpose of delivering the assignment, students need to be familiarized with the following.

- ✓ Workplace environment
- ✓ Personal protective equipment

ASSESSMENT GUIDE

Forms of assessment

Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.

Assessment context

- ✓ Assessment may occur on the job or in a workplace simulated activity.
- ✓ Access to a significant technical research and reporting requirement, information sources and a working environment.

Critical aspects (for assessment)

- ✓ Locate, interpret and apply information.
- ✓ Apply safety requirements throughout the work sequence, including the use of personal protective clothing and equipment.
- ✓ Complete a significant technical report covering:
    - detailed research of the topic area
    - a full analysis of the research outcomes
    - conclusions and recommendations clearly supported by the facts
    - satisfaction of legal, regulatory or intellectual property law requirements.
- ✓ Modify activities to cater for variations in research findings.
- ✓ Work effectively with others.

Assessment conditions

Assessment must reflect both events and processes over a period of time.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ technical writing and presentation techniques. ✓ enterprise (or equivalent) technical procedure formats, content rules, preparation and management techniques. ✓ Technical report structures ✓ Presentation techniques	Skills to be developed: ✓ research, collect, organise and understand technical information related to the subject area, developmental activities, testing processes, diagnostic methods and options and safety procedures. ✓ communicate ideas and information to ensure the completeness, clarity and comprehension of the technical report by the target audience.

UNIT TITLE	Apply and maintain Occupational Health and Safety				
DESCRIPTOR	This unit of competency describes the skills and knowledge to monitor and maintain work health and safety (WHS) within a work area where the person has supervisory responsibility for others.				
CODE	CONCM09V1/21	**LEVEL**	IV	**CREDIT**	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Perform all work safely	1.1. Use established work practices and personal protective equipment (PPE) to ensure personal safety and that of other workplace personnel 1.2. Clean, care for and store equipment, materials and reagents as required 1.3. Minimise the generation of wastes and environmental impacts 1.4. Ensure safe disposal of laboratory/hazardous wastes
2. Ensure others in the work group are able to implement safe work practices	2.1. Ensure hazard controls and PPE appropriate to the work requirements are available and functional 2.2. Provide and communicate current information about workplace health and safety policies, procedures and programs to others 2.3. Ensure hazards and control measures relating to work responsibilities are known by those in the work area 2.4. Provide support to those in the work area to implement procedures to support safety 2.5. Identify and address training needs within level of responsibility
3. Monitor observance of safe work practices in the work area	3.1 Ensure workplace procedures are clearly defined, documented and followed 3.2 Identify any deviation from identified procedures and report and address within level of responsibility 3.3 Ensure personal behaviour is consistent with workplace policies and procedures 3.4 Encourage and follow up others to identify and report hazards in the work area 3.5 Monitor conditions and follow up to ensure housekeeping standards in the work area are maintained
4. Participate in risk management processes	4.1 Report and address any identified hazards and inadequacies in existing risk controls within level of responsibility and according to workplace procedures 4.2 Participate in risk assessments to identify and analyse risks 4.3 Support the implementation of procedures to control risk (based on the hierarchy of control)

	4.4 Ensure records of incidents in the work area and other required documentation are accurately completed and maintained.
5. Support the implementation of emergency procedures within the work group	5.1 Ensure that workplace procedures for dealing with incidents and emergencies are available and known by work group 5.2 Implement processes to ensure that others in the work area are able to respond appropriately to incidents and emergencies 5.3 Participate, as required, in investigations of hazardous incidents to identify their cause

RANGE STATEMENT

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

- ✓ Common Hazards
- ✓ Risk control measures
- ✓ Risk Assessment

Tools, equipment and materials required may include:

Part of the tools and equipment may include the following.

- ✓ new information
- ✓ urgent requests
- ✓ modified activities
- ✓ changed situations
- ✓ late instructions
- ✓ substitution of materials or equipment

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Competency standard.

Critical aspects (for assessment)

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and:

- ✓ effectively monitored and maintained work health and safety (WHS) within 1 work area, including:
- ✓ ensuring others in the workgroup work safely and follow procedures for hazard identification and risk control and implement safe work practices.

Assessment conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- ✓ use of suitable facilities, equipment and resources, including:
- ✓ typical laboratory/field work equipment and materials
- ✓ PPE and other safety equipment
- ✓ workplace WHS documentation, management system, policies and procedures.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ strategies for controlling risks through the hierarchy of control, including: ▪ appropriate use of personal protective clothing ▪ eliminating hazards ▪ isolating hazards ▪ using administrative controls ▪ using engineering controls ✓ first aid procedures ✓ identification of hazards in the workplace, including: ▪ fire, chemical and electrical hazards ▪ managing broken or faulty equipment ▪ slip, trips and falls ▪ spills and leakage of materials ▪ storage of dangerous goods and hazardous substances ▪ waste ✓ management of WHS, including: ▪ communication and consultation processes ▪ interpreting symbols for WHS signage ▪ manual handling procedures ▪ reporting procedures	Skills to be developed: ✓ Communication and interpersonal skills to: ▪ report unsafe work practices, faulty plant and equipment and incidents and accidents through clear and direct communication ▪ share information ▪ use and interpret non-verbal communication ✓ literacy and numeracy skills to: ▪ estimate weights, size, quantities and mixtures ▪ interpret symbols used for WHS signage ▪ read and interpret instructions ✓ technical skills to: ▪ dispose of waste appropriately ▪ handle broken or damaged equipment ▪ identify hazardous goods and substances ▪ locate and identify emergency exits and use safety alarms and fire extinguishers ▪ store and use chemicals and hazardous substances ▪ use personal protective gear and equipment

UNIT TITLE	Carry out data entry and retrieval procedures				
DESCRIPTOR	This unit deals with the skills and knowledge required to operate computer to enter, manipulate, and retrieve and to access data and communicate via the Internet.				
CODE	CONCM10V1/21	LEVEL	IV	CREDIT	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Initiate computer system	1.1. The hardware components of the computer and their functions are correctly identified. 1.2. Equipment is powered up correctly. 1.3. Access codes are correctly applied. 1.4. Appropriate software is selected or loaded from the menu.
2. Enter data	2.1 Types of data for entry correctly identified and collected. 2.2 Input devices selected and used are appropriate for the intended operations. 2.3 Manipulative procedures of Input device conform to established practices. 2.4 Computer files are correctly located or new files are created, named and saved. 2.5 Data is accurately entered in the appropriate files using specified procedure and format. 2.6 Back-up made in accordance with operative procedures.
3. Retrieve data	3.1 The identity and source of information is established. 3.2 Authority to access data is obtained where required. 3.3 Files and data are correctly located and accessed. 3.4 Integrity and confidentiality of data are maintained. 3.5 The relevant reports or information retrieved using approved procedure. 3.6 Formats of retrieved report or information conform to that required. 3.7 Copy of the data is printed where required.
4. Amend data	4.1 Source of data/information for amendment is established. 4.2 Data to be amended is correctly located within the file. 4.3 The correct data/information is entered, changed or deleted using appropriate input device and approved procedures.

	4.4 The Integrity of data is maintained.
5. Monitor the operation of equipment	5.1. The system is monitored for correct operation of tasks. 5.2. Routine system messages are promptly and correctly dealt with. 5.3. Error conditions within level of authority are dealt with promptly and uncorrected errors are promptly reported. 5.4. Output devices and materials are monitored for quality.
6. Access and transmit information via the Internet	6.1. Access to the Internet is gained in accordance with the provider's operating procedures. 6.2. Evidence of the ability to negotiate web sites to locate and access specified information and other services is efficiently demonstrated. 6.3. E-mail is sent and retrieved competently.
7. Close down computer system	7.1. The correct shut down sequence is followed. 7.2. Problem with shutting down computer is reported promptly. 7.3. All safety and protective procedures are observed.

RANGE STATEMENT

Software included: (at least 2)

- ✓ word processing
- ✓ spreadsheet
- ✓ Internet access
- ✓ power point
- ✓ database
- ✓ design Programme (CAD)

Input devices included: (at least 3)

- ✓ keyboard
- ✓ mouse
- ✓ scanner
- ✓ microphone
- ✓ camera
- ✓ light pen
- ✓ barcode scanner

Output devices (at least 1)

- ✓ printer
- ✓ monitors
- ✓ speakers
- ✓ multi-media projectors

Tools, equipment and materials required may include:

- ✓ Relevant procedure manuals
- ✓ Availability of telephone, printer, computer, internet, etc.
- ✓ Availability of data on projects and services; tariff and rates, promotional activities in place etc.

ASSESSMENT GUIDE

Form of assessment

- ✓ Assessment for the unit needs to be holistic and must include real or simulated workplace activities.

Assessment context

Assessment of this unit must be completed on the job or in a simulated work environment which reflects a range of practices.

Critical aspects (for assessment)

You must provide evidence that shows you have done this over a sufficient period of time. It is essential that competence be observed in the following aspects:

- ✓ initiate the use of the equipment
- ✓ locate and access data
- ✓ use file operations
- ✓ manipulate input devices
- ✓ key-in and format documents
- ✓ access to the Internet

Assessment conditions

Assessment methods must confirm consistency of performance over time and in a range of workplace relevant contexts. Assessment should be by direct observation of tasks and/or samples of work and questioning on underpinning knowledge.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge required: ✓ Safety for working with and around computers. ✓ Computer hardware and software systems. ✓ The operation of the data entry management system. ✓ Files operations and their applications. ✓ Creating, locating and saving files. ✓ Routine functions of a software. ✓ Formatting function of software. ✓ Graphic productions and manipulation. ✓ Regard for accuracy and security of information. ✓ Functions on the Internet. ✓ Identify computer hardware. ✓ Manipulate data input devices. ✓ Access and retrieve data. ✓ Amend, save and print data. ✓ Search and retrieve data from the Internet. ✓ Send and receive E-mail.	Skills required: ✓ Ability to implement workstation adjustment according to OH&S guidelines ✓ Basic analysis in relation to a limited range of routine tasks ✓ Low-level decision making in relation to a limited range of routine tasks ✓ Problem solving skills in known areas during normal routine activities ✓ Reading and writing at a level where basic workplace documents are understood ✓ Clear and precise communication ✓ Ability to interpret user manuals ✓ Using a PC and peripherals ✓ Cultural understanding

UNIT TITLE	Apply mathematics for water operations				
DESCRIPTOR	The aim of this module is to enable the candidate to: Use calculation to solve simple problems, construct plane figures, and develop patterns.				
CODE	CONCM11V1/21	**LEVEL**	IV	**CREDIT**	07

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Perform simple mathematic calculations	1.1. Perform simple calculations on: fractions and decimals, calculations to a number of significant figures, decimal places 1.2. Identify and use the multiples and sub-multiples of units 1.3. Perform calculations on: perimeter and area of plane figures (i.e. square and rectangle, triangle, circle), volume and surface area (i.e. cube, rectangular prism, cylinder), mass of containers and their contents (i.e. cube, rectangular prism, cylinder) 1.4. Perform mathematical calculations involving formulas, angles, triangles and geometric construction 1.5. Identify and use formulas for SI quantities: length, area, volume, mass, density
2. Apply knowledge of mathematics in water operations	2.1 Identify and use units of Measurement 2.2 Perform calculations on: Conversion Factors, Weight, Concentration, and Flow 2.3 Perform mathematical calculations involving Typical Water/Wastewater Conversion Examples 2.4 Perform Temperature Conversions and Population Equivalent (PE) or Unit Loading Factor 2.5 Perform calculations on: Specific Gravity and Density, Flow and Detention Time 2.6 Perform chemical Addition Conversions
3. Undertake water/wastewater calculations	3.1. Perform Faucet Flow Estimation 3.2. Calculate Service Line Flushing Time 3.3. Perform Composite Sampling Calculation (Proportioning Factor) and Biochemical Oxygen Demand (BOD) Calculations 3.4. Perform mathematical calculations on Moles and Molarity, Normality, Settleability (Activated Biosolids Solids), Settleable Solids, Biosolids Total Solids, Fixed Solids, and Volatile Solids 3.5. Calculate Biosolids Volume Index (BVI) and Biosolids Density Index (BDI)

RANGE STATEMENT

As per the range of mathematics and drawing, students need to undertake the following.

- ✓ Use calculations to solve simple workshop problems.
- ✓ Make sketches of simple first and third angle orthographic projections from actual objects and pictorial views.
- ✓ Make sketches of simple sectional views.
- ✓ Develop patterns of three-dimensional figures and their frustums between parallel planes.
- ✓ Construct plane figures from given data

Tools, equipment and materials required may include:

Tools, equipment and materials used for this unit may include but not limited to the following.

- ✓ Calculator
- ✓ Drawing tools
- ✓ Drawing table
- ✓ Note pads
- ✓ Pens/pencils

ASSESSMENT GUIDE

Forms of assessment

Assessment for the unit needs to be continuous and holistic and must include real or simulated workplace activities.

Critical aspects (for assessment)

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of mathematics and drawing. This unit may be assessed in conjunction with all and units which form part of the normal job role.

Assessment conditions

It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying circumstances.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ Use calculations to solve simple laboratory problems ✓ Use mathematics in laboratory related mathematical problems in linear measurements ✓ Apply formulas to solve problems in laboratory	✓ Perform simple laboratory calculations ✓ Solve laboratory related mathematical problems related to linear measurement

UNIT TITLE	Prepare basic technical drawing				
DESCRIPTOR	This unit covers identifying the drawing requirements, preparing or making changes to engineering drawings, preparing an engineering parts list and issuing the drawings				
CODE	CONS03CR01V1/21	LEVEL	IV	CREDIT	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Identify drawing requirements	1.1 Requirements and purpose of drawing are determined from customer and/or work specification and associated documents. 1.2 All data necessary to produce the drawing is identified and collected. 1.3 Drawing requirements are confirmed with relevant personnel and timeframes for completion are established.
2. Develop knowledge and proper techniques in preparing drawings and sketches	2.1. Drafting equipment is selected appropriate to the drawing method chosen. 2.2. Drafting principles are applied to produce a drawing that is consistent with standard operating procedures within the enterprise. 2.3. All work is undertaken safely and to prescribed procedure. 2.4. Completed drawing is approved in accordance with standard operating procedures.
3. Perform drawing and sketches to workplace requirements	3.1 Drawings and or parts lists records are completed in accordance with standard operating procedures. 3.2 Approved drawings and or parts lists are copied and issued to relevant personnel in accordance with standard operating procedures. 3.3 Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures.

RANGE STATEMENT

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

Tools, equipment and material used in this unit may include:

For the purpose of delivering the assignment, students need to be familiarized with the following.

- ✓ Drafting and drawing equipment includes the use of Computer Aided Drafting systems
- ✓ Drawing records may include cataloguing, issuing security classifications, filing, preparing distribution lists
- ✓ Drawings are issued in hard copy, photographic, slide or transparency form including presentation as a single drawing and/or with other drawings, support documentation as a package

ASSESSMENT GUIDE

Form of assessment

Assessment for the unit needs to be holistic and must include real or simulated workplace activities.

Assessment context

Assessment of this unit must be completed on the job or in a simulated work environment which reflects a range of practices.

Critical aspects (for assessment)

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations. This unit may be assessed in conjunction with all units which form part of the normal job role.

Assessment conditions

- ✓ Theoretical assessment of this unit must be carried out in an examination room where proper examination rules are followed.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ requirements and purpose of the drawing to be produced ✓ procedures for producing an initial drawing and changing existing drawing ✓ drafting principles to be applied to the production/changing of a drawing ✓ standards to which the drawing is to be produced ✓ procedures for checking drawings ✓ procedures and reasons for recording completed drawings and or parts lists ✓ procedures for copying approved drawings and or parts lists ✓ procedures for issuing approved drawings and or parts lists	Skills to be developed: ✓ using drafting equipment appropriate to the drawing method chosen ✓ producing the component parts list with part name, description of part, material specification or part number, quantities and all other details specified by the customer and/or organisational procedures ✓ where appropriate, copying and issuing approved drawings and or parts lists in accordance with standard operating procedures ✓ handling and storing the approved drawings and or parts lists in accordance with standard operating procedures

UNIT TITLE	Plan to undertake a routine task				
DESCRIPTOR	This unit covers a person planning their own work where tasks involve one or more steps or functions and are carried out routinely on a regular basis. It includes the concepts of following routine instructions, specifications and requirements.				
CODE	CONS03CR02V1/21	LEVEL	IV	CREDIT	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Identify task requirements	1.1. Instructions and procedures are obtained, understood and where necessary clarified. 1.2. Relevant specifications for task outcomes are obtained, understood and where necessary clarified. 1.3. Task outcomes are identified. 1.4. Task requirements such as completion time and quality measures are identified.
2. Plan steps required to complete task	2.1 Based on instructions and specifications provided, the individual steps or activities required to undertake the task are understood and where necessary clarified. 2.2 Sequence of activities is identified. 2.3 Plan is checked to ensure it complies with specifications and task requirements.
3. Review plan	3.1 Effectiveness of plan is reviewed against specifications and task requirements. 3.2 If necessary, plan is revised to better meet specifications and task requirements.

RANGE STATEMENT

Procedures included:

- ✓ Greeting procedure
- ✓ Complaint and comment handling procedure
- ✓ Incidence reporting procedures
- ✓ General knowledge of property
- ✓ Standard operating procedures for service deliveries
- ✓ Non-verbal and verbal communication
- ✓ Dress and accessories
- ✓ Gestures and mannerisms
- ✓ Voice tonality and volume
- ✓ Culturally specific communication customs and practices
- ✓ Cultural and social differences

Includes but are not limited to:

- ✓ Modes of greeting, fare welling and conversation

- ✓ Body language/ use of body gestures
- ✓ Formality of language

Interpersonal skills:
- ✓ Interactive communication
- ✓ Good working attitude
- ✓ Sincerity
- ✓ Pleasant disposition
- ✓ Effective communication skills
- ✓ Customer needs

Customer with limitation may include:
- ✓ Those with a disability
- ✓ Those with special cultural or language needs
- ✓ Unaccompanied children
- ✓ Parents with young children
- ✓ Pregnant women
- ✓ Single women

Tools, equipment and materials required may include:
- ✓ Relevant procedure manuals
- ✓ Availability of telephone, printer, computer, internet, etc.
- ✓ Availability of data on projects and services; tariff and rates, promotional activities in place etc.

ASSESSMENT GUIDE

Form of assessment

Assessment for the unit needs to be holistic and must include real or simulated workplace activities.

Assessment context

Assessment of this unit must be completed on the job or in a simulated work environment which reflects a range of practices.

Critical aspects (for assessment)

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations. This unit may be assessed in conjunction with all units which form part of the normal job role.

Assessment conditions
- ✓ Theoretical assessment of this unit must be carried out in an examination room where proper examination rules are followed.
- ✓ Assessment of hygienic work practices must be constantly evaluated.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ correct sources of information for a particular task ✓ procedures for obtaining instructions and clarification ✓ specifications for the task ✓ hazards and established control measures associated with the routine task, including housekeeping ✓ safe work practices and procedures	Skills to be developed: ✓ obtaining instructions for tasks from correct source of information such as job card. ✓ clarifying tasks and required outcomes with appropriate personnel where necessary ✓ identifying relevant specifications from documentation, job cards, or other information source ✓ preparing plans and sequencing of task activities ✓ comparing planned steps against specifications and task requirements ✓ communicating and interpreting information among stakeholders

UNIT TITLE	Apply science for Water Operations				
DESCRIPTOR	This unit of competency covers the ability to relate fundamental laws of science with routine tasks and work environment.				
CODE	CONS03CR03V1/21	**LEVEL**	IV	**CREDIT**	06

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Apply principals and theories of physics in real world	1.1 Perform scalars and vector arithmetic 1.2 Understand kinetics and perform simple calculations 1.3 Understand circulation motion, and governing laws 1.4 Understand and apply the laws of Forces in real world examples 1.5 Understand the Conservation of Energy principals and apply in real world 1.6 Understand the momentum and impulse 1.7 Understand kinematics 1.8 Understand wave principals
2. Apply principals and theories of chemistry in real world examples	2.1 Understanding matter • States of matter, and properties related to it • Pure substances and mixtures 2.2 Understanding atoms, molecules, elements and compounds, and basic understanding of chemical reactions 2.3 Understanding solvents, solutions, saturation facts, and concentration limits 2.4 Observing properties of acids and bases, and understanding strong and weak acids

RANGE STATEMENT

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

Tools, equipment and material used in this unit may include,

- ✓ Lab equipment
- ✓ Motors
- ✓ Fans
- ✓ pendulum

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Competency standard.

Critical aspects (for assessment)

Assessors should ensure that candidates have knowledge of:

- ✓ principles vector units and scalar units
- ✓ principles of kinematics
- ✓ principles of circular motion
- ✓ laws of forces
- ✓ laws of conservation of energy
- ✓ principle of momentum
- ✓ states of matter and how chemical properties and physical properties of matter are related
- ✓ atoms, molecule, elements, compounds
- ✓ solvents, solutions, saturation
- ✓ acids and bases

Assessment conditions

- ✓ use of suitable facilities, equipment and resources, including:
    - o laboratory/field work environment, equipment and materials
- ✓ modelling of industry operating conditions, including:
    - o access to staff and students.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
✓ relating nature of physics to real world, and apply it in day to day work ✓ understanding the scientific laws, and limits, and how they govern the real-world applications	✓ working principles of machineries ✓ principles of physics ✓ scientific terminology and technical details

UNIT TITLE	Store fluids in bulk				
DESCRIPTOR	This competency covers the storage and transfer of fluids to and from tanks. In a typical scenario the plant technician will manage a series of liquid storage tanks for raw materials and finished product as part of the production process.				
CODE	CONS03CR04V1/21	**LEVEL**	IV	**CREDIT**	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare storage/ loading facilities.	2.1 Ensure that products are being stored in the tank area to procedures 2.2 Inspect storage facilities for leaks or damage 2.3 Check and test safety equipment and systems to verify their operational condition and status, and report all equipment faults 2.4 Confirm quantities and specifications of stored liquids in the tank area 2.5 Identify all equipment requiring maintenance 2.6 Take appropriate action
3. Transfer fluids to and from tanks	3.1. Confirm tank capacities and identification and quality of current contents, and determine if these are being maintained within the agreed product requirements prior to transfer 3.2. Ensure all areas involved in the transfer are safe to allow transfer of liquids to occur 3.3. Inspect all transfer equipment before transfer, including lines, hoses, pumps, fittings, instruments and controls 3.4. Confirm that transfer destination has sufficient capacity for the transfer 3.5. Take appropriate action 3.6. Transfer liquids safely to procedures 3.7. Conduct cleaning, purging or draining as required 3.8. Record transfer as required.
4. Isolate and de-isolate plant.	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service.

RANGE STATEMENT

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

Products may include

- ✓ fluid material or
- ✓ product in the plant and stored in bulk.

Fluids may include any material which flows, and includes materials which:

- ✓ are normally a liquid at ambient conditions
- ✓ are normally a gas at ambient conditions
- ✓ have been liquefied
- ✓ have been vaporized
- ✓ have been melted
- ✓ are in a condition when they can flow.

Typical problems for your facility may include:

- ✓ interruptions to loading through adverse weather conditions
- ✓ selection of appropriate storage facility
- ✓ control of temperature and pressure
- ✓ variations in feed
- ✓ vibration
- ✓ tank capacities and space.

Appropriate action includes:

- ✓ determining problems needing action
- ✓ determining possible fault causes
- ✓ rectifying problem using appropriate solution within area of responsibility
- ✓ following through items initiated until final resolution has occurred
- ✓ reporting problems outside area of responsibility to designated person.

Procedures may be written, verbal, computer-based or in some other form. They include:

- ✓ all work instructions
- ✓ standard operating procedures
- ✓ formulas/recipes
- ✓ batch sheets
- ✓ temporary instructions
- ✓ any similar instructions provided for the smooth running of the plant.

Tools and equipment include the following:

All the relevant Tools and equipment need to be supplied to the students prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Competency standard.

Critical aspects (for assessment)

Competence must be demonstrated in the ability to recognize and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble and include the following.

- ✓ early warning signs of equipment/processes needing attention or with potential problems are recognised
- ✓ the range of possible causes can be identified and analyzed and the most likely cause determined
- ✓ appropriate action is taken to ensure a timely return to full performance

- ✓ obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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Assessment conditions

The unit should be assessed holistically and the judgement of competence based on a holistic assessment of the evidence. The collection of performance evidence:

- ➢ should occur over a range of situations which include typical disruptions to normal, smooth operation of an operating plant
- ➢ will typically include a supervisor/third-party report or other evidence, focusing on consistent performance and problem recognition and solving. must include the use of an appropriate industrial item of equipment requiring demonstration of operation, start-up and shutdown procedures and responding to problems
- ➢ may use industry-based simulation for part only of the unit where safety, lack of opportunity or significant cost is an issue.

- ✓ Assessment should occur in operational workplace situations. Where this is not possible, or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment reflecting realistic operational workplace conditions.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ Knowledge of all items on of the tank site including their functions ✓ storage and transfer techniques required for the materials being handled ✓ tank capacities, percentages and product mixes ✓ flow rates and measures ✓ principles of operation of plant/equipment ✓ science (e.g. physics, chemistry, biochemistry) relevant to the items and materials being handled ✓ process parameters and limits (e.g. temperature, pressure, flow and pH) ✓ relevant alarms and actions ✓ hazards that may arise in the job/work environment, and: ▪ their possible causes ▪ potential consequences ▪ appropriate risk controls. function and troubleshooting of major components and their problems.	Skills to be developed: ✓ determine and apply any special handling or storage requirements, including dangerous or hazardous goods requirements ✓ undertake checks, inspections and tests to confirm processes and equipment conform to safety requirements and job specifications ✓ recognize early warning signs of equipment/processes needing attention or with potential problems ✓ take appropriate action to ensure a timely return to full performance ✓ isolate and de-isolate equipment ✓ identify hazards and apply hazard control procedures ✓ complete workplace forms.

UNIT TITLE	Operate and monitor pneumatic systems and equipment				
DESCRIPTOR	This unit covers the operation and monitoring of a complex compressor system and associated equipment.				
CODE	CONS03CR05V1/21	**LEVEL**	IV	**CREDIT**	07

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Startup compressor systems/ equipment.	2.1 Perform pre-start-up checks 2.2 Check the status of the system/equipment prior to commencing start-up process 2.3 Check all required auxiliary systems, including oil and water, to confirm their operational condition 2.4 Startup individual items of equipment and the entire compressor system as required 2.5 Bring the system to required operating conditions.
3. Control and monitor the compressor system.	3.1. Initiate load-up through the selection of appropriate speed or cycle 3.2. Monitor and adjust downstream equipment as required 3.3. Monitor the operational condition and safety status of the unit/system and take appropriate action 3.4. Adjust operational speeds and operating cycles as required 3.5. Monitor or activate safety systems to ensure that any system shutdowns are controlled and conducted safely and effectively.
4. Shut down compressor systems/equipment.	4.1. Confirm shutdown cause with other personnel and plant operators before commencing to isolate or shut down the equipment/system 4.2. Implement control measures to minimise damage and hazards 4.3. Shut down system according to procedures 4.4. Inspect the system/equipment as required by procedures 4.5. Isolate and purge systems/equipment and prepare plant for maintenance as required.
5. Maintain plant effectiveness.	5.1. Frequently and critically monitor all plant throughout shift 5.2. Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant 5.3. Identify critical equipment/processes and tune

	their performance 5.4. Identify issues likely to impact on plant performance and take appropriate action 5.5. Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people 5.6. Test trips and alarms as required

Range Statement

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

Appropriate action includes:

- ✓ determining problems needing action
- ✓ determining possible fault causes
- ✓ rectifying problem using appropriate solution within area of responsibility
- ✓ following through items initiated until final resolution has occurred
- ✓ reporting problems outside area of responsibility to designated person.

This unit of competency includes all such items of equipment and unit operations which form part of the compressor system. For your plant this may include (select relevant items):

- ✓ single/multi-stage rotary compressors (axial flow, centrifugal, turbine, screw)
- ✓ single/multi-stage reciprocating compressors
- ✓ turbo expanders/compressors
- ✓ advanced lube and seal oil systems
- ✓ intercoolers/heat exchangers
- ✓ scrubbers
- ✓ instrument/control systems
- ✓ programmable logic controllers (PLCs)
- ✓ process controllers.

Typical problems for your plant may include:

- ✓ surging
- ✓ control of temperature and pressure
- ✓ variations in feed
- ✓ vibration.

Tools and equipment include the following:

All the relevant Tools and equipment need to be supplied to the students prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Competency standard.

Critical aspects (for assessment)

Competence must be demonstrated in the ability to recognize and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability

to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that:

- ✓ early warning signs of equipment/processes needing attention or with potential problems are recognized
- ✓ the range of possible causes can be identified and analyzed and the most likely cause determined
- ✓ appropriate action is taken to ensure a timely return to full performance
- ✓ obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response.

Assessment conditions

- ✓ The unit should be assessed holistically and the judgement of competence based on a holistic assessment of the evidence.
- ✓ The collection of performance evidence:
- ➢ should occur over a range of situations which include typical disruptions to normal, smooth operations
- ➢ must include the use of industrial style compressor appropriate to this unit
- ➢ may use industry-based simulation for part only of the unit particularly where safety, lack of opportunity or significant cost is an issue.
- ✓ Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ hierarchy of control ✓ communication protocols, e.g. radio, phone, computer, paper, permissions/authorities ✓ routine problems, faults and their resolution ✓ relevant alarms and actions ✓ plant process idiosyncrasies ✓ all items on a schematic of the plant item and the function of each ✓ correct methods of starting, stopping, operating and controlling process ✓ function and troubleshooting of major components and their problems ✓ types and causes of problems within operator's scope of skill level and responsibility. ✓ physics and chemistry relevant to the process unit and the materials processed ✓ process parameters and limits, eg temperature, pressure, flow, pH ✓ principles of operation of plant/equipment ✓ compression flows and characteristics ✓ liquid and product separation principles ✓ product characteristics and tolerances ✓ flow, pressure, temperature, levels and rates.	Skills to be developed: Competence includes: ✓ efficient and effective operation of plant/equipment ✓ hazard analysis ✓ completing plant records ✓ communication ✓ problem solving Competence also includes the ability to isolate the causes of problems to an item of equipment within the compressor system and to distinguish between causes of problems/alarm/fault indications such as: ✓ process gas variations ✓ instrument failure/wrong reading ✓ electrical failure ✓ mechanical failure ✓ operational problem.

UNIT TITLE	Operate process control systems				
DESCRIPTOR	This unit covers the operation of a centralized control panel. These controllers use a range of control algorithms and multiple control loops. The panel will control multiple vessels/plant items and or products. It will typically be located off plant in a control room.				
CODE	CONS03CR06V1/21	**LEVEL**	IV	**CREDIT**	06

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Use operator interface.	2.1 Use keyboards, track ball and monitor and/or stand-alone controllers to access control system/panel 2.2 Monitor the process using the operator interfaces 2.3 Select appropriate controller modes 2.4 Access historical data and information 2.5 Acknowledge messages and alarms.
3. Access control information.	3.1. Obtain relevant data and information from the control system by applying systems knowledge 3.2. Identify the status of individual pieces of equipment from the control panel and use information to identify potential faults 3.3. Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics 3.4. Record process variations/irregularities to procedures.
4. Control process variations and monitor operations.	4.1. Use historical data to assist the identification of problems 4.2. Process available information to identify potential faults 4.3. Undertake required set point/output changes to meet plant and process requirements 4.4. Optimize plant operating conditions in accordance with guidelines 4.5. Adjust production in response to test results and control panel information 4.6. Monitor key process and environmental variables and take appropriate action 4.7. Adjust controller settings in accordance with procedures 4.8. Use fine tuning software as appropriate 4.9. Coordinate with upstream and downstream units as appropriate 4.10. Record adjustments and variations to specifications/schedules 4.11. Communicate to appropriate personnel as required.
5. Facilitate planned and	5.1. Select and apply procedures to planned startup and

unplanned process start-ups and shut-downs.	shutdown processes 5.2. Select and apply procedures to unplanned shutdown processes 5.3. Implement all required emergency responses 5.4. Communicate necessary information to all personnel affected by events 5.5. Log all required information.
6. Respond to alarms or out of specification conditions.	6.1. Identify system(s) affected by the alarm or condition 6.2. Interpret alarms and prioritize actions to be taken 6.3. Take appropriate action to respond to the alarm or incident 6.4. Deal with any out of specification material in accordance with procedures 6.5. Communicate the problem/solution to appropriate personnel 6.6. Record the information as required 6.7. Provide details of the alarm and action taken to the next shift at change over

Range Statement

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

Context:

This unit of competency includes all such items of equipment and unit operations which form part of the control system. For your control room this may include (select relevant items):

- ✓ process control systems, eg Distributed Control Systems
- ✓ personal computers
- ✓ printers
- ✓ fire and gas detection/protection systems
- ✓ emergency shutdown systems
- ✓ communications systems.

Typical problems for your plant may include:

- ✓ loss of power/utilities
- ✓ analysing failure modes
- ✓ variation/loss of feed
- ✓ unstable control of pressure, temperature level and flows
- ✓ control equipment failure
- ✓ process plant trips
- ✓ change in atmospheric conditions (rain, temperature, wind, lightning)
- ✓ emergency situations.

Alarms or other abnormal conditions includes:

- ✓ emergency, including emergency shut down
- ✓ partial or complete controller failure.

Appropriate action:

Appropriate action includes:

- ✓ determining problems needing action

- ✓ determining possible fault causes
- ✓ rectifying problem using appropriate solution within area of responsibility
- ✓ following through items initiated until final resolution has occurred
- ✓ reporting problems outside area of responsibility to designated person.

Tools and equipment include the following:

All the relevant Tools and equipment need to be supplied to the students prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Competency standard.

Critical aspects (for assessment)

Competence must be demonstrated in the ability to recognize and analyse potential situations requiring action and then in implementing appropriate responses. Consistent performance should be demonstrated. In particular look to see that:

- ✓ early warning signs of equipment/processes needing attention or with potential problems are recognised
- ✓ the range of possible causes can be identified and analyzed and the most likely cause determined

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response.

Assessment conditions

The unit should be assessed holistically and the judgement of competence based on a holistic assessment of the evidence. The collection of performance evidence:

- ✓ Assessment should occur in operational workplace situations. Where this is not possible, or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment reflecting realistic operational workplace conditions.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ the architecture and location of the process/production equipment ✓ specific plant process operations ✓ interactions between plant items/processes ✓ systems operating parameters ✓ process specific physics, chemistry and mathematics ✓ basic science of upstream and downstream processes ✓ relevant chemistry of the process to the level of interpreting chemical equations and manipulating factors controlling rate of reaction and yield. ✓ impact of external factors, e.g. variations in weather, feed etc. ✓ process drawings, e.g. P&ID, PFD ✓ cause and effect ✓ instrumentation and control systems, including feed forward, feedback and open control ✓ control loops, including PID control, set points, controlled variable, indicated variable ✓ interaction between multiple control loops, including cascade control ✓ UPS and its applications and use.	Skills to be developed: ✓ instrument failure/malfunction ✓ electrical failure/malfunction ✓ mechanical failure/malfunction ✓ equipment design deficiencies ✓ product parameters (temperature, flows, pressure and levels) ✓ process control system malfunction ✓ power/utility failures.

UNIT TITLE	Monitor and operate water distribution systems				
DESCRIPTOR	In this scenario operations technicians maintain a watching brief over the network from the control Centre. The centre will be the hub for network activities in order to achieve minimum risk to continued safe and efficient operation of the network. The control centre operations technician will communicate with field personnel to obtain information and direct field operators to check and maintain network.				
CODE	CONS03CR07V1/21	**LEVEL**	IV	**CREDIT**	06

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Gather information about network operation needs.	1.1. Respond to and record messages and information received from field operations and pipeline system stations 1.2. Interpret and acknowledge alarm codes correctly to ensure the correct response strategy is selected and applied to the situation 1.3. Clarify additional information needs and select an appropriate communication medium to deliver the information required 1.4. Improve operational efficiency through adequate and timely application of information provided 1.5. Interpret and action customer/shipper gas forecasts to ensure correct gas flow rates into the pipeline system are achieved.
2. Communicate network information.	2.1 Monitor activities of pipeline personnel in the field and data from the control Centre 2.2 Evaluate internal messages and response communications concerning system alarms/incidents to establish the scope and severity of the alarm/ incident 2.3 Convey pipeline system operation information to relevant personnel in other work areas to ensure safe and efficient operation of the pipeline system 2.4 Relay information to technicians and other services/parties so that fault finding or safety checks can be conducted to identify risks to product supply, pipeline equipment, environment and personnel 2.5 Authorize, record and monitor permits to work to allow operational activities to be undertaken or cancelled.
3. Coordinate network systems operations.	3.1. Monitor field and pipeline station operations data 3.2. Monitor and observe equipment operating conditions, pressures and temperatures, and maintain correct equipment operating parameters 3.3. Identify faults and initiate the required repair or reporting of the fault

	3.4. Isolate identified faults in the pipeline as appropriate 3.5. Respond to system alarms and emergencies 3.6. Determine the required course of action or emergency response to the identified system condition/ emergency 3.7. Complete and document pre-shutdown checks 3.8. Shut down the pipeline system under either normal or emergency conditions in accordance with operating procedures 3.9. Confirm all identified maintenance is in compliance with the permit to work system and administer to ensure that all work complies with all issued permits.
4. Record and report.	4.1. Record and monitor field personnel movements to ensure the safety of all personnel in the field 4.2. Report safety and environmental risks or faulty equipment to designated personnel for further action or advice concerning the selection of the appropriate response or course of action 4.3. Interpret and maintain field inspection records and reports 4.4. Complete operations and production reports 4.5. Perform shift handover procedures.

RANGE STATEMENT

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

Context:

This unit of competency includes all such items of equipment and unit operations which form part of the pipeline control system. For your organisation this may include (select relevant items):

- ✓ radio communications equipment, email, fax and telephones
- ✓ heaters, furnaces and exchangers
- ✓ station instrumentation/metering equipment
- ✓ condition monitoring equipment
- ✓ process control equipment
- ✓ gas quality and analysis equipment
- ✓ valves, actuators and flanges
- ✓ piping systems
- ✓ pressure vessels/filtration equipment
- ✓ compressors and prime movers
- ✓ cathodic protection systems.

Typical problems for your plant may include:

- ✓ communications disruptions
- ✓ corrosion/hydrate formation
- ✓ variations in flow temperature and/or pressure
- ✓ failures of piping, valves or flanges
- ✓ pipeline leakages.

Appropriate action includes:

- ✓ determining problems needing action
- ✓ determining possible fault causes
- ✓ rectifying problem using appropriate solution within area of responsibility
- ✓ following through items initiated until final resolution has occurred
- ✓ reporting problems outside area of responsibility to designated person.

Procedures may be written, verbal, computer-based or in some other form. They include:

- ✓ all work instructions
- ✓ standard operating procedures
- ✓ formulas/recipes
- ✓ batch sheets
- ✓ temporary instructions
- ✓ any similar instructions provided for the smooth running of the plant.

Tools and equipment include the following:

All the relevant Tools and equipment need to be supplied to the students prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Competency standard.

Critical aspects (for assessment)

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- ✓ early warning signs of equipment/processes needing attention or with potential problems are recognised
- ✓ the range of possible causes can be identified and analyzed and the most likely cause determined
- ✓ appropriate action is taken to ensure a timely return to full performance
- ✓ obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Assessment conditions

As a general rule assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ system hydraulics basics ✓ system layout ✓ system calculations ✓ environmental aspects of maintenance ✓ lock-out procedures for mechanical and electrical installations ✓ relevant utilities and service bodies ✓ communication systems ✓ hazardous materials handling ✓ landscape and ground structure of work area ✓ risk management principles ✓ risk factors and potential hazards of inspection processes ✓ equipment operation, capacity and limitations ✓ effects of weather and conditions on system operation and plant ✓ control systems ✓ pipes and fittings within operator's scope of skill level and responsibility.	Skills to be developed ✓ system hydraulics basics ✓ system layout ✓ system calculations ✓ environmental aspects of maintenance ✓ lock-out procedures for mechanical and electrical installations ✓ relevant utilities and service bodies ✓ communication systems ✓ hazardous materials handling ✓ landscape and ground structure of work area ✓ risk management principles ✓ risk factors and potential hazards of inspection processes ✓ equipment operation, capacity and limitations ✓ effects of weather and conditions on system operation and plant ✓ control systems ✓ pipes and fittings .

UNIT TITLE	Conduct chlorine dosing of water at the point of supply				
DESCRIPTOR	This unit covers the competency required to conduct chlorine dosing of water at the point of supply and appropriately monitor the collected samples and manage to keep a record of the dosing data.				
CODE	CONS03CR08V1/21	**LEVEL**	IV	**CREDIT**	04

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Prepare for chlorine dosing	1.1. Chlorines are used, handled and stored in accordance with organisational policies and procedures. 1.2. Chlorine residue level is established via field water testing. 1.3. Chlorine residue level is compared with national drinking water guidelines and information related to chlorine concentration to determine chlorine demand.
2. Perform chlorine dosing	2.1 Chlorine dosing is conducted in accordance with organisational policies and procedures. 2.2 Personal protective equipment is selected, fitted and used correctly. 2.3 Dosing is monitored to maintain parameters of dosing to achieve desired chlorine residue level. 2.4 Dosing faults are identified and acted on, in accordance with organisational policies and procedures.
3. Monitor chlorine dosing performance	3.1 Dosing samples are collected and field tested to confirm chlorine residue level and water quality. 3.2 Dosing data is collected, recorded and reported according to organisational policies and procedures. 3.3 Observations outside defined parameters are reported for further action.

RANGE STATEMENT

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

Point of supply my include:

- ✓ Trailer mounted water containers
- ✓ Water distribution point
- ✓ 20 L water jerry cans
- ✓ 100 L water bladder

Organizational policies and procedures may include:

- ✓ Clinical standards (state/territory and national)
- ✓ Codes of ethics
- ✓ Codes of practice
- ✓ Environmental health policy
- ✓ Health and hygiene guidelines
- ✓ Health surveillance policy documents
- ✓ Industry professional body standards
- ✓ Industry standards (state/territory and national)
- ✓ Organisational health policy directives
- ✓ Pesticides manual
- ✓ Relevant Standards
- ✓ Relevant Commonwealth Acts
- ✓ Workplace safety guidelines

Field water testing ay include:

- ✓ Faucal coliform bacteria
- ✓ Free chlorine level (after addition)
- ✓ pH
- ✓ Physical characteristics (taste, colour, odor and temperature)
- ✓ Radioactivity (as ordered)
- ✓ Selected poisons (if presence is suspected, normally arsenic and cyanide, and may include mustard and nerve agents)
- ✓ Total coliform bacteria
- ✓ Total dissolved solids (TDS)
- ✓ Turbidity

Chlorine dosage:

- ✓ is the amount of chlorine added to water; dosage is expressed as a concentration, normally in terms of milligrams per liter (mg/L)

Personal protective equipment:

- ✓ Chemical resistant apron
- ✓ Chemical resistant gloves
- ✓ Eye protection

Dosing faults may include

- ✓ Chlorine residual level too high
- ✓ Chlorine residual level too low
- ✓ Insufficient contact time allowed
- ✓ Water pH level too high
- ✓ Water temperature too high

Tools and equipment include the following:

All the relevant Tools and equipment need to be supplied to the students prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Competency standard.

Critical aspects (for assessment)

Assessment must confirm the ability to:

- ✓ handle, store and used chlorine safely
- ✓ accurately calculate chlorine dosing levels
- ✓ identify and respond to dosing faults.

Consistency in performance

Competency should be demonstrated over a minimum of two assessment occasions.

Assessment conditions

access to the full range of equipment involved in integrated continuous manufacturing of power generation systems in a pulp or paper manufacturing facility, including chemical products:

- ✓ high and low voltage transformers
- ✓ steam or gas turbine driven alternators
- ✓ switchboards
- ✓ water systems and auxiliary plant
- ✓ circuit breaker
- ✓ AC/DC generation and distribution systems
- ✓ analogue and digital instrumentation

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ EPA Maldives guidelines ✓ best use of available resources ✓ causes of disease transmission ✓ causes of manpower wastage ✓ chlorine dosing levels per volume of water ✓ control measures of disease transmission ✓ documentation processes relevant to own workplace ✓ handling and storage requirements for chlorine ✓ process of disease ✓ relationship between chlorine, water pH and temperature as it relates to water disinfection ✓ risk management principles ✓ safe water handling practices ✓ water quality assurance measures	Skills to be developed: ✓ calculate chlorine dosing level ✓ communicate appropriately about, consult on and impart knowledge of: ▪ causes of disease transmission ▪ causes of manpower wastage ▪ control measures of disease transmission ▪ safe water handling practices ▪ water quality assurance measures ✓ interpret data gathered in the field against quality standards ✓ liaise and communicate with persons in positions of authority ✓ make technical judgements based on own level of knowledge and experience ✓ measure chemicals accurately ✓ prioritize tasking ✓ work safely

UNIT TITLE	Perform sampling and testing of water				
DESCRIPTOR	This unit covers the competency required to prepare and perform sampling along with understanding of the testing requirements and conducting according to a specific standard while maintaining a safer environment				
CODE	CONS03CR09V1/21	**LEVEL**	IV	**CREDIT**	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Confirm sampling and testing requirements	1.1. Confirm the sampling location, number and type of samples, and timing and frequency of sampling from the enterprise or client's sampling plan 1.2. Check that all sampling and testing procedures are in accordance with client or enterprise requirements, relevant standards and codes
2. Prepare for water sampling	2.1 Identify site and sampling hazards and review enterprise safety procedures 2.2 Liaise with relevant personnel to arrange site access and, if appropriate, all necessary clearances and/or permits 2.3 Select sampling equipment and conditions to achieve representative samples and preserve sample integrity during collection, storage and transit 2.4 Ensure all reagents, solutions, standards and blanks (as appropriate) are obtained and/or prepared ready for field use 2.5 Select field test equipment/instruments and check operation and calibration, as required, in accordance with procedures and manufacturer instructions 2.6 Assemble and check all sampling equipment, field test equipment, materials, containers and safety equipment 2.7 Arrange suitable transport to, from and/or around site as required
3. Conduct sampling of water	3.1 Locate sampling sites and, if required, services at the site 3.2 Conduct representative sampling in accordance with sampling plan and defined procedures for field and/or laboratory testing, as required 3.3 Ensure all controls, blanks and replicate samples are properly integrated into the sampling process 3.4 Record all information and label samples in accordance with traceability requirements 3.5 Record environmental conditions and any atypical observations made during sampling that may impact on sample representativeness or integrity 3.6 Transport all samples back to base according to

	enterprise procedures and relevant codes 2.8 Distribute samples/sub-samples to required destinations for testing, maintaining sample integrity, traceability and chain of custody requirements, as necessary
4. Conduct field testing of water	4.1 Obtain sample or sub-sample for designated field test, or locate testing location for in-situ testing 4.2 Check equipment/instruments set-up and reagents and calibrate, as necessary, to ensure safe operation and valid results 4.3 Run quality control (QC) samples to check method validity 4.4 Operate equipment/instruments in accordance with test method requirements 4.5 Perform tests/procedures/observations on all samples, and standards, if appropriate, in accordance with specified methods 4.6 Record all field observations and results and ensure that they are accurately transferred to enterprise information database
5. Maintain a safe work environment	5.1 Use defined safe work practices and personal protective equipment to ensure personal safety and that of others 5.2 Minimise the generation of waste 5.3 Rehabilitate sampling site to render it safe and minimise environmental impacts 5.4 Clean all equipment, containers, work area and vehicles according to enterprise procedures 5.5 Check serviceability of all equipment before storage 5.6 Ensure the safe collection of all hazardous wastes for appropriate disposal

RANGE STATEMENT

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

Common field test parameters include one or more of:

- ✓ pH
- ✓ electrical conductivity
- ✓ dissolved oxygen
- ✓ salinity
- ✓ temperature
- ✓ turbidity
- ✓ Secchi disk depth.

Laboratory and/ or field test parameters include one or more of:

- ✓ total suspended solids
- ✓ volatile suspended solids
- ✓ nitrogen (nitrate, organic, ammonia and Kjeldahl)
- ✓ phosphorus (total and soluble reactive)
- ✓ chlorophyll and phaeophytin

- ✓ total organic carbon (TOC)
- ✓ biological oxygen demand (BOD)
- ✓ chemical oxygen demand (COD)
- ✓ silica
- ✓ metals (total and dissolved)
- ✓ organic and inorganic pollutants
- ✓ microorganisms.

Hazards include one or more of:

- ✓ solar radiation, dust and noise
- ✓ personnel getting lost
- ✓ accidents, emergencies and incidents, such as snake, insect or animal bites
- ✓ exposure to severe weather conditions
- ✓ manual handling of heavy objects
- ✓ vehicle and boat handling in rough/remote conditions.

Tools and equipment include the following:

- ✓ All the relevant Tools and equipment need to be supplied to the students prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Competency standard.

Critical aspects (for assessment)

Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include:

- ✓ planning and preparing for sample collection
- ✓ interpreting and correctly applying sampling, testing and data quality procedures
- ✓ demonstrating correct and safe use of field instruments and/or equipment, including field calibration
- ✓ obtaining reliable, representative water samples
- ✓ obtaining valid and reliable field test data
- ✓ preparing calibration graphs and calculating results using appropriate units and precision
- ✓ identifying atypical results as out-of-normal range or an artefact
- ✓ completing sampling records using enterprise procedures
- ✓ working safely and follow relevant legislative requirements for the disposal of waste and the preservation of the environment.

Assessment conditions

- ✓ access to the full range of equipment involved in integrated continuous manufacturing of power generation systems in a pulp or paper manufacturing facility, including chemical products:
  - high and low voltage transformers
  - steam or gas turbine driven alternators
  - switchboards
  - water systems and auxiliary plant
  - circuit breaker
  - AC/DC generation and distribution systems
  - analogue and digital instrumentation
- ✓ personal protective equipment suitable for operating a power generation system

- ✓ template operating log and documents for recording power generation processes and maintenance requirements
- ✓ organisational workplace health and safety and standard operating procedures
- ✓ relevant personnel for the purposes of communicating information.
- ✓ Competency is to be assessed in the workplace or in a productive environment that accurately reflects performance in a workplace.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ appropriate scientific terminology for water chemistry, biology and microbiology ✓ the hydrologic cycle ✓ fundamentals of aquatic chemistry: ▪ physical and chemical properties of water ▪ chemical equilibria in natural, polluted and process waters ▪ biogeochemical processes in freshwater and marine systems ▪ water analytical environmental chemistry ▪ environmental contaminants in water (fate, transport and bioaccumulation) ✓ fundamentals of hydrobiology ✓ principles and procedures for random, systematic and stratified sampling ✓ preservation of the integrity of samples ✓ maintaining identification of samples relative to their source ✓ common characteristics of water to be sampled and likely contaminants ✓ links between quality control, quality assurance, quality management systems and sampling procedures ✓ enterprise procedures dealing with legislative requirements for the handling, labelling and transport of hazardous goods	Skills to be developed: ✓ field sampling and monitoring procedures, including pre-treatment, containers, preservation, storage, labelling and traceability ✓ demonstrating correct and safe use, of field instruments and/or equipment under laboratory and field conditions, including field calibration ✓ identifying and rectifying basic instrument faults ✓ collecting representative samples in accordance with a sampling plan ✓ using appropriate techniques to preserve the integrity of samples ✓ identifying atypical materials and samples and taking appropriate action ✓ maintaining sampling equipment ✓ completing sampling records ✓ seeking advice when issues/problems are beyond scope of competence/responsibility ✓ working safely for the protection of self and others ✓ following requirements for the disposal of waste and the preservation of the environment

UNIT TITLE	Operate and Maintain water production systems				
DESCRIPTOR	This unit describes the outcomes required to operate, monitor and maintain water production systems across the water plants installed. Proper operational techniques including all the relevant knowledge will be developed among the participants while completing this unit.				
CODE	CONS03CR10V1/21	LEVEL	IV	CREDIT	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Conduct local inspections and pre-operational safety checks	1.1. Local inspections and pre-operational safety checks are conducted within Occupational Health and Safety (OHS) regulations, environmental and safe working requirements/practices. 1.2. Isolations are removed 1.3. Availability of supplies for water system is confirmed 1.4. Plant status and requirements are determined 1.5. Sequencing for plant startup is confirmed
2. Startup water systems	2.1 Water systems are started up within OHS, housekeeping, SOP, environmental and safe working requirements and practices 2.2 Water system is started up 2.3 Water system is observed for correct startup operational response 2.4 Startup variation conditions are detected and corrective action taken
3. Operate and control water treatment processes.	3.1 Carry out routine plant inspections according to organisational and plant requirements. 3.2 Conduct and analyse process tests and compare performance to plant operational requirements. 3.3 Make integrated process adjustments to optimize system performance according to organisational and statutory requirements. 3.4 Collect, interpret and record process according to organisational and plant requirements. 3.5 Correctly select, fit and use required safety equipment, including personal protective equipment.
4. Monitor and control water systems	4.1 Water systems are monitored and controlled within OHS, housekeeping, SOP, environmental and safe working requirements and practices 4.2 Water system operation is monitored 4.3 Water samples are taken and tested to maintain quality as required

	4.4 Routine checks of water systems are conducted as required 4.5 Variations from operational parameters are identified 4.6 Action is taken to restore water system to standard operational parameters 4.7 Operator level maintenance is conducted as required
5. Conduct a water system shutdown	5.1 Water system shutdown is conducted within OHS, housekeeping, SOP, environmental and safe working requirements and practices 5.2 Shutdown plan is confirmed and communicated to relevant personnel 5.3 Shutdown procedures are implemented 5.4 Plant is left in a safe condition for isolation as required
6. Respond to an unplanned shutdown	5.4 Unplanned shutdown is responded to within OHS, housekeeping, SOP, environmental and safe working requirements and practices 5.5 Cause of shutdown is identified and actioned as required 5.6 Sequence for systems shutdown of plant is completed 5.7 Action taken is communicated to relevant personnel 5.8 Plant is left in a safe condition for isolation as required
7. Maintain items of equipment used in water treatment processes.	7.1 Identify maintenance requirements and schedules according to standard operating procedures. 7.2 Complete maintenance and cleaning requirements of equipment.
8. Record and report water systems information	8.1 Water systems information is recorded and reported within OHS, housekeeping, SOP, environmental and safe working requirements and practices 8.2 Water systems information is recorded as required 8.3 Problems and related action are recorded and communicated to relevant personnel

RANGE STATEMENT

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

Water system:

- ✓ reverse osmosis plant

Tools, equipment and material used in this unit may include:

Materials and supplies:
- ✓ chemicals
- ✓ filtering mediums

Equipment:
- ✓ flow control and metering devices
- ✓ pumping systems
- ✓ electronic and digital monitoring and metering
- ✓ valving systems
- ✓ recording systems
- ✓ pipes
- ✓ fittings
- ✓ chemical testing and analysis equipment
- ✓ chemical dosing equipment
- ✓ tanks and chests
- ✓ hand and power tools
- ✓ computer systems
- ✓ electronic screens and alarms
- ✓ process control systems
- ✓ fully automated, semi-automated, manually operated plant and equipment appropriate to water processes and systems
- ✓ analogue and digital instrumentation

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment guidelines.

Critical aspects (for assessment)

Evidence should be relevant to the work. It should satisfy the requirements of the elements and performance criteria and include consideration of:
- ✓ the required knowledge and skills tailored to the needs of the specific workplace
- ✓ applicable OHS regulations, environmental and safe working requirements/practices, SOP and housekeeping requirements
- ✓ practical workplace demonstration of skills in the operation of water systems

Assessment conditions

Assessment of skills must take place under the following conditions:
- ✓ physical conditions:
  - a workplace or a productive environment that accurately reflects performance in a workplace
- ✓ resources, equipment and materials:
  - access to the full range of equipment required to Operate and Maintain water production systems in a pulp or paper manufacturing facility
  - test and diagnostic equipment
  - PPE required for operating water systems
- ✓ specifications:
  - template operating log and documents for recording operation of the water system and maintenance requirements
  - organisational workplace health and safety and SOPs.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ Procedures, regulations and legislative requirements ✓ Relevant forms of communication ✓ Basic problem-solving techniques ✓ Sampling and testing process for plant and system operations, and process monitoring ✓ Working knowledge of water system, plant, processes, layout and associated services sufficient to carry out startup and shutdown activities within level of responsibility ✓ Types, causes and effects of water system shutdowns ✓ Required responses to all unplanned shutdowns (e.g. power outage, mechanical breakdown, blockages, jamming, air supply, control system failure) to ensure safety quality and productivity ✓ Emergency procedures and responses ✓ Effects of shutdowns on the rest of the systems	Skills to be developed: ✓ Interprets instruments, gauges and data recording equipment ✓ Takes samples, conducts tests, interprets and records results, if required ✓ Identifies and monitors process control points ✓ Plans and organizes startup and shutdown of water systems ✓ Identifies and responds appropriately to shutdown causes ✓ Responds to problems associated with plant shutdown and unplanned shutdown to ensure safety quality and productivity ✓ Maintains situational awareness in the work area ✓ Operates high risk equipment as required ✓ Uses electronic control and other systems to control equipment and processes as required

UNIT TITLE	Apply accident-emergency procedures				
DESCRIPTOR	This unit involves the skills and knowledge required to apply accident emergency procedures, including responding to an incident, controlling and assisting at an accident or emergency site, finalizing accident-emergency processes, and completing records, reports and other required documentation.				
CODE	CONS03CR11V1/21	LEVEL	IV	CREDIT	06

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Respond to the incident	1.1. Response to the incident or accident is in accordance with workplace emergency procedures and relevant regulatory requirements 1.2. Details of the cause(s) and effects of the incident are identified and reported 1.3. Assistance requirements for accidents and emergencies are clarified and reported immediately to the appropriate parties 1.4. Requests for assistance are made to relevant personnel and emergency services
2. Control and assist at accident or emergency site	2.1 Site is controlled and protected until the arrival of authorized personnel 2.2 Assistance is provided to injured persons, within the limitations of duty of care and workplace procedures 2.3 Relevant authorities at the site are cooperated with and assisted within workplace policies
3. Finalize accident - emergency process and complete records	3.1 Relevant information is exchanged in accordance with state/territory law and workplace procedures 3.2 Documentation and reports are completed and processed in accordance with workplace and relevant regulatory requirements

Range Statement

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

Work may be conducted:

- ✓ in a range of work environments
- ✓ by day or night

Work may be conducted in:

- ✓ limited or restricted spaces
- ✓ exposed conditions
- ✓ controlled or open environments
- ✓ even or uneven surfaces
- ✓ wet or dry surfaces

Workplace hazards may include but are not restricted to:

- ✓ moving heavy loads in an unsafe work environment
- ✓ unsecured machinery, components or repaired equipment
- ✓ slippery floors
- ✓ flammable liquids, vapours and fuel
- ✓ poor housekeeping procedures
- ✓ non-compliance with safe working procedures
- ✓ electrical wiring and systems, including exposed electrical circuits
- ✓ working at heights and in confined spaces
- ✓ toxic gases and substances
- ✓ chemicals and other harmful substances
- ✓ damaged goods, pallets and containers
- ✓ dangerous/hazardous goods

Tools and equipment include the following:

All the relevant Tools and equipment need to be supplied to the students prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Competency standard.

Critical aspects (for assessment)

The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements include the following:

- ✓ the underpinning knowledge and skills
- ✓ relevant legislation and workplace procedures
- ✓ other relevant aspects of the range statement

Assessment conditions

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ Relevant regulatory and code requirements applicable in accident/emergency situations ✓ Relevant OH&S and environmental protection policies and procedures ✓ Workplace procedures for accident-emergency response ✓ Workplace emergency, fire and accident procedures ✓ Site layout ✓ Focus of operation of work systems, equipment or management, site and organisational operating and emergency procedures ✓ Typical problems that can occur during a safety incident, accident or emergency and related action that can be taken	Skills to be developed ✓ Communicate effectively with others when responding to an accident or an emergency ✓ Interpret and follow operational instructions and prioritize work ✓ Promptly report and/or rectify any identified problems, faults or malfunctions ✓ Implement contingency plans for unplanned events that may occur when responding to an accident or an emergency ✓ Apply precautions and required action to minimise, control or eliminate hazards ✓ Monitor work activities in terms of planned schedule ✓ Modify activities depending on differing operational contingencies, risk situations and environments ✓ Work systematically with required attention to detail without injury to self or others, or damage to goods or equipment

UNIT TITLE	Perform trouble shooting of control systems				
DESCRIPTOR	This unit covers finding and rectifying faults in process control apparatus and systems. The unit encompasses safe working practices, interpreting process and circuit diagrams, applying knowledge of process controls to logical fault-finding procedures, conducting repairs, safety and functional testing and completing the necessary service documentation.				
CODE	CONS03CR12V1/21	**LEVEL**	IV	**CREDIT**	06

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Find faults.	1.1 Health and safety risk control measures and procedures for carrying out the work are followed. 1.2 Develop relevant theoretical knowledge 1.3 The need to test or measure live is determined in strict accordance with health and safety requirements. 1.4 Apparatus is checked as being isolated where necessary in strict accordance health and safety requirements and procedures 1.5 Fault finding is approached methodically drawing on knowledge of industrial processes and control apparatus and systems using measured and calculated values of system parameters. 1.6 Apparatus components are dismantled where necessary and parts stored to protect them against loss or damage 1.7 Faulty components are rechecked and their fault status confirmed. 1.8 Unexpected situations are dealt with safely and with the approval of an authorized person 1.9 Fault finding activities are carried out without damage to apparatus, circuits, the surrounding environment or services and using sustainable energy principles.
2. Rectify fault.	2.1. Health and safety risk control measures and procedures for carrying out the work are followed. 2.2. Apparatus is checked as being isolated where necessary in strict accordance to standard requirements and procedures 2.3. Materials required to rectify faults are sourced and obtained in accordance with established procedures. 2.4. Repairs are affected efficiently without damage to other components or apparatus and using sustainable energy principles. 2.5. Effectiveness of the repair is tested in accordance with established procedures. 2.6. Apparatus is reassembled, finally tested and

	prepared for return to customer.
3. Completion and report fault finding and rectification activities	3.1. OHS work completion risk control measures and procedures are followed. 3.2. Work area is cleaned and made safe in accordance with established procedures. 3.3. Written justification is made for repairs to apparatus. 3.4. Work completion is documented and appropriate person(s) notified in accordance with established procedures

RANGE STATEMENT

This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Tools and equipment include the following:

All the relevant Tools and equipment need to be supplied to the students prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Competency standard.

Critical aspects (for assessment)

Before the critical aspects of evidence are considered all prerequisites must be met.

- ✓ A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to comply to Occupational Health and Safety workplace procedures and practices, apply sustainable energy principles and practices, demonstrate an understanding of the required skills and knowledge as described in this unit.

Assessment conditions

As a general rule assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ pipeline system functions within the design parameters and design philosophy ✓ SCADA systems ✓ alarm systems and emergency systems, including fire and shutdown ✓ MSDS information. ✓ physics and chemistry relevant to the process unit and the materials processed ✓ process parameters and limits, e.g. temperature, pressure, flow, pH ✓ correct methods of starting, stopping, operating and controlling process ✓ corrective action appropriate to the problem cause ✓ function and troubleshooting of major components and their problems ✓ types and causes of problems within operator's scope of skill level and responsibility.	Skills to be developed: ✓ pipeline pressure variations ✓ instrument failure/wrong reading ✓ electrical failure ✓ mechanical failure ✓ operational problems.

UNIT TITLE	Apply sustainable and efficient operation				
DESCRIPTOR	This unit covers identifying, implementing and monitoring strategies for sustainable resource use. Moreover, accessing and evaluating the current resources and knowing how to utilize while reviewing the effective methods to reduce resource usages				
CODE	CONS03CR13V1/21	**LEVEL**	IV	**CREDIT**	07

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Assess and evaluate current resource utilisation	1.1 Reliable measurable indicators of resource utilisation are identified to provide data on resource consumption. 1.2 Measurement is undertaken accurately and comprehensively. 1.3 Comparisons are made against identified practice from a variety of sources and accepted standards of performance.
2. Monitor and review effectiveness of ways to reduce resource usage	2.1. Regular data is collected and analyzed to provide accurate measures of performance. 2.2. Comparisons are made with strategy objectives to assess effectiveness. 2.3. Changes to implementation strategy are made as required in a timely manner to ensure outcomes are achieved or alternatives are introduced. 2.4. Information obtained during monitoring and review is used to develop new strategies that are based on accumulated knowledge and experience. 2.5. Information is shared on a regular basis with other councils and relevant agencies.
3. Conduct routine checks of performance efficiency	3.1. Use appropriate hand tools and hand-held power tools to implement routine checks of machine performance and preventative maintenance strategy, in accordance with manufacturer instructions 3.2. Assess and perform periodic servicing, such as lubrication and greasing, in accordance with manufacturer instructions 3.3. Clean machine in accordance with manufacturer cleaning instructions and work environment
4. Perform preventative maintenance procedures	4.1. Inspect parts according to operating procedures and manufacturer instructions 4.2. Maintain service and production records to assist with life cycle monitoring of parts and machine, as required 4.3. Identify faulty parts for repair, replacement or adjustment and take necessary action 4.4. Inspect, check and monitor replacement parts and consumables to ensure they comply with operational specifications

Range Statement

The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance.

Resources may include:

- ✓ Water, air
- ✓ energy
- ✓ timber
- ✓ soil, sand and rock
- ✓ ores

Assessment may include:

- ✓ audits, such as energy audits
- ✓ surveys

Information may include:

- ✓ Internet information
- ✓ Relevant reports
- ✓ new technology developments related to sustainability
- ✓ results of monitoring and research

Tools and equipment include the following:

All the relevant Tools and equipment need to be supplied to the students prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

On the job or in a simulated work environment and followings are suggested.

- ✓ observation of the learner performing a range of workplace tasks over sufficient time to demonstrate handling of a range of contingencies
- ✓ written and/or oral questioning to assess knowledge and understanding
- ✓ completion of workplace documentation
- ✓ third-party reports from experienced practitioners
- ✓ completion of self-paced learning materials including personal reflection and feedback from trainer, coach or supervisor

Critical aspects (for assessment)

Critical aspects of evidence to be considered

- ✓ Comprehensive data of local relevant resources
- ✓ Relevant data gathered from a variety of sources
- ✓ Analysis of data to indicate options for sustainable use of resources
- ✓ Evidence of consultation with appropriate stakeholders to gain support for identified strategies
- ✓ Clear and accessible reports that provide practical strategies

Assessment conditions

A person who demonstrates competency in this unit will be able to perform the outcomes described in the elements to the required performance level detailed in the performance criteria.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ environmental issues ✓ principles of ecologically sustainable development ✓ impacts on the environment of overuse of resources ✓ state of the environment reports ✓ relevant legislation ✓ available resources ✓ minimisation of resource usage ✓ community needs and expectations ✓ regulations, standards and policies ✓ training requirements ✓ community information ✓ community demographics	Skills to be developed: ✓ data gathering ✓ analytical ✓ budget cycle ✓ program planning, review and monitoring ✓ evaluation processes ✓ presentation

UNIT TITLE	Perform Chemical Cleaning				
DESCRIPTOR	This unit of competency describes the skills and knowledge required to prepare process equipment for cleaning in place or in-line. It applies to food processing equipment that is fixed in place and cannot be moved to a cleaning station. It requires the operator to initiate, monitor and control variables during cleaning.				
CODE	CONS03CR14V1/21	LEVEL	IV	CREDIT	05

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Prepare for cleaning	1.1 Read or listen to work instructions from supervisor and clarify where needed 1.2 Identify health and safety hazards in the workplace and tell supervisor 1.3 Wear appropriate personal protective equipment and ensure correct fit 1.4 Confirm that chemical stocks are available to meet cleaning and food safety requirements 1.5 Confirm that services are available and ready for operation 1.6 Plan equipment shut down and take equipment off-line for cleaning 1.7 Configure equipment and related valves and pipework to confirm readiness for cleaning 1.8 Set the plant for the cleaning cycle
2. Operate and monitor the cleaning process	2.1 Carry out the cleaning cycle as directed 2.2 Monitor the cleaning process for completeness 2.3 Record cleaning data appropriately 2.4 Identify, rectify and report out-of-specification process and equipment performance
3. Dispose of waste and return plant to operating condition	3.1 Flush cleaning chemicals from plant and dispose of accordingly 3.2 Set up plant to meet operational requirements 3.3 Conduct work according to workplace environmental guidelines

RANGE STATEMENT

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

Productivity requirements:

- ✓ energy efficiency
- ✓ waste minimisation
- ✓ evaporation minimisation, including landfill and waste water reduction
- ✓ environmentally safe waste disposal
- ✓ consideration of resource utilisation, including fibre efficiency
- ✓ minimising delays
- ✓ chemical recovery maximization

- ✓ meeting key performance indicators
- ✓ machine/process time availability i.e. time the machine or process is making product
- ✓ machine/process production rate

Water system:
- ✓ reverse osmosis plant

Water sources:
- ✓ raw water

Materials and supplies:
- ✓ chemicals
- ✓ filtering mediums

Tools, equipment and material used in this unit may include:
- ✓ flow control and metering devices
- ✓ pumping systems
- ✓ electronic and digital monitoring and metering
- ✓ valving systems
- ✓ recording systems
- ✓ pipes
- ✓ fittings
- ✓ chemical testing and analysis equipment
- ✓ chemical dosing equipment
- ✓ tanks and chests
- ✓ cranes and hoists
- ✓ communication equipment
- ✓ aeration ponds
- ✓ chemical handling equipment
- ✓ hand and power tools
- ✓ pest control equipment
- ✓ load shifting equipment
- ✓ small boat
- ✓ computer systems
- ✓ electronic screens and alarms
- ✓ process control systems
- ✓ fully automated, semi-automated, manually operated plant and equipment appropriate to water processes and systems
- ✓ analogue and digital instrumentation

ASSESSMENT GUIDE

Forms of assessment

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Competency standard.

Critical aspects (for assessment)

Evidence should be relevant to the work. It should satisfy the requirements of the elements and performance criteria and include consideration of:

- ✓ the required knowledge and skills tailored to the needs of the specific workplace
- ✓ applicable OHS regulations, environmental and safe working requirements/practices, SOP and housekeeping requirements
- ✓ applicable aspects of the range statement
- ✓ practical workplace demonstration of skills in the operation of water systems

Assessment conditions

- ✓ physical conditions:
- ✓ skills must be demonstrated in a workplace setting or an environment that accurately represents a real workplace
- ✓ resources, equipment and materials:
  - personal protective clothing and equipment
  - equipment to be cleaned, and related CIP system
  - chemicals and/or automated chemical addition system
- ✓ specifications:
  - Workplace standard operating procedures and task-related documents.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ purpose and basic principles of cleaning in place (CIP), including the use and functions of caustic and acid solutions, and cleaning sequence and stages. ✓ purpose and use of cleaning equipment and chemicals used ✓ terminology relating to the chemical solutions used ✓ safe work procedures, including appropriate signage of cleaning activities, and safe handling and storage of cleaners and sanitizers used ✓ cleaning and sanitizing requirements, including different levels of cleaning requirements ✓ characteristics of cleaning and sanitizing chemicals used, including basic composition as well as compatibility of chemicals with types of equipment ✓ basic operating principles of process control where relevant, including the relationship between control panels and systems and the physical equipment ✓ inspection points for cleaning and sanitizing ✓ consequences of contamination of process flows by cleaning solutions and related safeguards ✓ types of waste generated by both the production and the cleaning process and related collection, treatment and disposal requirements ✓ reporting and recording systems.	Skills to be developed: ✓ shutting down equipment and preparing for cleaning ✓ preparing and using chemicals according to safe work requirements ✓ cleaning equipment to meet work standards ✓ monitoring cleaning and report or address any non-compliances ✓ flushing equipment and dispose of waste according to environmental guidelines ✓ completing required documentation ✓ applying safe work practices and identify health and safety hazards and controls in the workplace ✓ applying food safety procedures.

UNIT TITLE	Operate and maintain of power generation system (renewable energy)				
DESCRIPTOR	This unit deals with the skills and knowledge for the co-ordination of the operations of a hybrid power plant.				
CODE	CONS03CR15V1/21	LEVEL	IV	CREDIT	07

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Coordinate the solar power plant operations	1.1 Plant operational procedures are implemented in consultation with others and reviewed as required 1.2 Resources and supplies are coordinated to meet plant requirements
2. Monitor solar power plant operations	2.1 Deviations from standard plant operations are identified and recorded 2.2 Plant operation and/or condition is monitored against statutory and enterprise requirements taking into account constraints, budget requirements and performance indicators 2.3 New requirements that may impact on operations are considered 2.4 Operations are monitored for suitability/approval with statutory, industry and enterprise/site requirements
3. Test solar power plant operation	3.1 Tests are performed in accordance with defined procedures applicable to the operational test 3.2 Plant is observed for correct operational response 3.3 Correct action is taken when response is not in accordance with documentation, plant integrity or personnel safety requirements 3.4 Plant is returned to required operational status upon completion of test
4. Report operations against strategy requirements	5.1 Data is collected and processed for review against the established strategy 5.2 Plant operation and/or condition is reported against statutory and enterprise requirements taking into account constraints, budget requirements and performance indicators 5.3 Abnormal operating conditions are reported 5.4 Changes to the strategy are suggested in accordance with information received

Range Statement

This relates to the competency standard unit as a whole, providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

Tools and equipment include the following:

All the relevant Tools and equipment need to be supplied to the students prior to the assessment.

ASSESSMENT GUIDE

Forms of assessment

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- ✓ OHS policy and work procedures and instructions.
- ✓ Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions.

Critical aspects (for assessment)

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the Assessment Guidelines.

Assessment conditions

- ✓ physical conditions:
- ✓ skills must be demonstrated in a workplace setting or an environment that accurately represents a real workplace
- ✓ resources, equipment and materials:
  - personal protective clothing and equipment
  - equipment to be cleaned, and related CIP system
  - chemicals and/or automated chemical addition system
- ✓ specifications:
  - Workplace standard operating procedures and task-related documents.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
Knowledge to be developed: ✓ Relevant environmental, occupational health and safety legislation and regulations ✓ Enterprise procedures ✓ Plant drawings and manufacturers manuals ✓ Introduction to and typical arrangements of hybrid power plant ✓ Relevant plant and equipment, its location and operating parameters ✓ Hybrid Power Plant operating parameters ✓ Relevant performance targets ✓ Relevant plant reliability targets ✓ Hybrid Power Plant efficiency ✓ Problem solving techniques ✓ Data collection and recording techniques ✓ Risk management principles ✓ Hybrid Power Plant operating parameters ✓ Enterprise recording procedures ✓ Measurement and analysis systems and procedures ✓ Communication principles ✓ Risk management principles.	Skills to be developed: ✓ Interpret plant drawings and manufacturers manuals ✓ Apply relevant state and territory regulations ✓ Apply enterprise recording procedures ✓ Identify plant status ✓ Apply problem solving ✓ Plan and prioritize work ✓ Communicate effectively ✓ Apply risk management principles ✓ Apply data analysis techniques and tool