



| Curriculum Document | | | | |
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| Curriculum Code | | Curriculum Title | | Logo |
| 713101000 | | Chemical Production Machine Operator | |  |
| | Name | Email | Phone | Logo |
| Development Quality Partner | Chemical Industries Education and Training Authority (CHIETA) | qualifications@chieta.org.za | 011-628 7000 |  |

Learner QDF Signature

Date

QDF Signature

Date

DQP Representative Signature

Date

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SECTION 1: CURRICULUM SUMMARY

1. Occupational Information

1.1 Associated Occupation

713101: Chemical Production Machine Operator

1.2 Occupation or Specialisation Addressed by this Curriculum

713101000: Chemical Production Machine Operator

1.3 Alternative Titles used by the Industry

- Slurry Manufacturing Operator

2. Curriculum Information

2.1 Curriculum Structure

This qualification is made up of the following compulsory Knowledge, Practical Skills and Workplace Experience Modules:

Knowledge Modules:

List of Knowledge Modules for which Specifications are included:

- 713101000-KM-01, Chemical manufacturing process work context, NQF Level 1, 2 Credits
- 713101000-KM-02, Chemical manufacturing process operations, NQF Level 2, 20 Credits
- 713101000-KM-03, Legislation applicable in the chemical manufacturing environment, NQF Level 3, 4 Credits
- 713201000-KM-04, Sampling and material testing in the chemical manufacturing process, NQF Level 2, 4 Credits

Total number of credits for Knowledge Modules: 30

List of Practical Skill Module Specifications

- 713101000-PM-01, Apply and maintain safety, health, environmental practices in chemical manufacturing process operations, NQF Level 2, 8 Credits
- 713101000-PM-02, Perform shift-handover and take-over procedures, NQF Level 1, 2 Credits
- 713101000-PM-03, Perform sampling and testing of materials, NQF Level 2, 8 Credits
- 713101000-PM-04, Handle and prepare chemicals for manufacturing as per plant requirements, NQF Level 2, 8 Credits
- 713101000-PM-05 Prepare and start-up equipment in a chemical manufacturing process, NQF Level 2, 10 Credits
- 713101000-PM-06, Monitor and control manufacturing systems processes, NQF Level 3, 16 Credits
- 713101000-PM-07, Planned and unplanned shutdown/stop of the process, NQF Level 2, 5 Credits
- 713101000-PM-08, Perform troubleshooting on equipment and process, NQF Level 3, 4 Credits

Total number of credits for Practical Skills Modules: 61

List of Work Experience Modules Specifications

- 713101000-WM-01, Shift handover and take-over processes, NQF Level 1, 3 Credits
- 731101000-WM02, Material quality assurance processes, NQF Level 3, 8 Credits
- 713101000-WM-03, Materials handling and loading/transfer processes, NQF Level 2, 8 Credits
- 713101000-WM-04, Equipment and plant setting-up, starting-up and adjusting processes, NQF Level 2, 8 Credits
- 713101000-WM-05, Monitoring and controlling manufacturing processes, NQF Level 3, 8 Credits
- 713101000-WM-06, Planned and unplanned equipment shutdown processes, NQF Level 2, 8 Credits

Total number of credits for Workplace Experience Modules: 43

3. Entry Requirements

Academic Requirements:

- NQF Level 1 with Communication and Mathematical Literacy

Physical Requirements

- None

4. Assessment Quality Partner Information

Name of body: The Chemical Industry Education and Training Authority (CHIETA)

Address of body: 2 Clamart Road, Richmond, Johannesburg

Contact person name: Tshidi Magonare

Contact person work telephone number: (011) – 628 7000 Ext 2043

5. Part Qualification Curriculum Structure

- None

SECTION 2: OCCUPATIONAL PROFILE

1. Occupational Purpose

The purpose of this qualification is to prepare a learner to operate as a Chemical Production Machine Operator.

A Chemical Production Machine Operator monitors and operates equipment to process, handle, transfer, sample and test a wide range of chemical products and troubleshoot equipment.

2. Occupational Tasks Details

2.1 Monitor, measure and load/transfer chemical ingredients following plant specific requirements, NQF Level 2

Unique Product or Service

- Compliant Materials

Occupational Responsibilities

- Receive, inspect, transfer and store production materials, NQF Level 2
- Record and accounts for all materials used on the line shift, NQF Level 1

Occupational Contexts

- Measuring and loading/transferring of materials processes, NQF Level 2
- Plant production specific processes, NQF Level 2

2.2 Set up, start, control, adjust and stop equipment and plant operations, NQF Level 2

Unique Product or Service

- Functional Equipment

Occupational Responsibilities

- Set up, start, control, adjust and stop chemical process equipment safely in line with standard operating procedures, NQF Level 2
- Perform log-out and tag-out procedures on equipment, NQF Level 2

Occupational Contexts

Equipment and plant set up, start, control, adjust and stop processes.

2.3 Monitor and control systems in the production process, NQF Level 3

Unique Product or Service

- Precise process equipment readings

Occupational Responsibilities

- Verify and record accuracy of equipment, NQF Level 3
- Set-up equipment and control process within set parameters, NQF Level 3
- Observe and record process, variables NQF Level 3

Occupational Contexts

Plant monitoring and controlling processes, NQF Level 3

2.4 Perform routine chemical and physical sampling and tests of material where required, NQF Level 2

Unique Product or Service

- Material quality data

Occupational Responsibilities

- Perform routine sampling of products or raw materials, NQF Level 2
- Read, interpret product test results and record production data, NQF Level 2

Occupational Contexts

Materials sampling and testing procedures, NQF Level 2

2.5 Monitor chemical processes and transfers of products in conformance with organisational procedures, NQF Level 2

Unique Product or Service

Quality Management of the production process

Occupational Responsibilities

- Operate and control chemical processing equipment, NQF Level 2

Occupational Contexts

Setting-up and starting-up of chemical equipment processes, NQF Level 2

2.6 Perform housekeeping activities and minor troubleshooting and repairs

Unique Product or Service

- Safe working environment

Occupational Responsibilities

- Clean and perform minor repairs to equipment machines and plant to prevent contamination of products, NQF Level 2
- Troubleshoot equipment and processing issues, NQF Level 2

Occupational Contexts

Housekeeping processes, NQF Level 2

2.7 Apply Safety, Health and Environment and Quality in the production process, NQF Level 3

Unique Product or Service

- Safe working environment

Occupational Responsibilities

- Apply elements of the environment and operating practices to ensure safe and healthy conditions, NQF Level 3
- Respond to emergency situations, NQF Level 3

Occupational Contexts

- Safety, Health, Environmental and Quality management processes or practices, NQF Level 3

SECTION 3: CURRICULUM COMPONENT SPECIFICATIONS

SECTION 3A: KNOWLEDGE MODULE SPECIFICATIONS

List of Knowledge Modules for which Specifications are included:

- 713101000-KM-01, Chemical manufacturing process work context, NQF Level 1, 2 Credits
- 713101000-KM-02, Chemical manufacturing process operations, NQF Level 2, 20 Credits

- 713101000-KM-03, Legislation applicable in the chemical manufacturing process environment, NQF Level 3, 4 Credits
- 713101000-KM-04, Sampling and material testing in the chemical manufacturing process, NQF Level 2, 4 Credits

Total number of credits for Practical Skills Modules: 30

1. 713101000-KM-01, Chemical manufacturing process work context, NQF Level 1, 2 Credits

1.1 Purpose of the Knowledge Module

The main focus of this knowledge module is to equip learners with an understanding of the chemical manufacturing process work environment, job roles and responsibilities of a chemical manufacturing process machine operator.

The learning will enable learners to demonstrate an understanding of:

- KM-01-KT01: Introduction to the chemical manufacturing process (100%)

1.2 Guidelines for Topics

1.2.1 KM-01-KT01: Introduction to the chemical manufacturing process. (100%)

Topic elements to be covered include:

- KT0101 Overview of the manufacturing process
- KT0102 Job requirements, roles and responsibilities
- KT0103 Different career opportunities in the chemical manufacturing process

Internal Assessment Criteria and Weight

- List the roles, responsibilities and obligations of chemical manufacturing process operators in the chemical manufacturing process environment
- Describe the role and importance of a Work Permit system in the chemical manufacturing process industry
- Identify aspects that may contribute to improper conduct of the chemical manufacturing process operator in the chemical manufacturing process environment in terms of the Code of Conduct

- Describe and compare the different career opportunities in the chemical manufacturing process in terms of job roles, demands and benefits

(Weight 100%)

1.3 Provider Accreditation Criteria

Physical Requirements:

The provider should demonstrate access to:

- Classroom and furniture (chairs and tables, audio equipment and all other equipment conducive to a learning environment)
- Structured learning material and lesson plans that address all the topics specified in the scope statement of this module

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessors must have assessment expertise in terms of the subject matter related to this module
- Moderation of assessment processes must be a person with evaluative expertise

Legal Requirements:

- Compliance with occupational health, safety and environmental legislative requirements

1.4 Exemptions

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

2. 713101000-KM-02, Chemical manufacturing process operations, NQF Level 2, 20 Credits

2.1 Purpose of the Knowledge Module

The main focus of this knowledge module is to equip learners with an understanding of the chemical manufacturing process operations.

The learning will enable learners to demonstrate an understanding of:

- KM-02-KT01: Fundamentals of chemical manufacturing process operations (40%)
- KM-02-KT02: Chemical manufacturing process equipment (30%)
- KM-02-KT03: Maintaining good manufacturing practices (30%)

2.2 Guidelines for Topics

2.2.1 KM-02-KT01: Fundamentals of chemical manufacturing process operations (40%)

Topic elements to be covered include:

- KT0101 Basic concepts, terminologies and definitions
- KT0102 Basic principles of chemistry and physics
- KT0103 Types of chemicals/materials in the workplace
- KT0104 Sampling theory and practice
- KT0105 Basic principles of chemical manufacturing process operations
- KT0106 Types of hazardous substances and processes

Internal Assessment Criteria

- Define the basic concepts and terminologies applicable in the chemical manufacturing process industry
- Define the concepts of 'process' and 'process control' in terms of their importance, variability, efficiency and safety.

- Identify the various types of hazards and risks associated with chemical manufacturing process
- Identify and define the key components of matter applicable in the chemical manufacturing environment according to standard chemical principles
- Define the 'temperature', 'pressure', 'energy' and 'heat' in terms of their relationship according to standard principles of chemistry and physics
- Identify and describe the physical and chemical properties of materials applicable to the chemical manufacturing process
- Identify and define the units of measure in terms of their physical properties
- Identify and explain the methods of separation and/or segregation of materials
- Explain the concept and role of measurement in quality control in accordance with organisational operating procedures
- Explain the purpose of monitoring measurements related to the material within the parameters in a processing environment as stated in terms of product quality

(Weight 100%)

2.2.2 KM-02-KT02: chemical manufacturing process equipment (30%)

Topic elements to be covered include:

- KT0101 Types of chemical processing equipment
- KT0102 Equipment inspection process
- KT0103 Drawings and diagrams of process units and utilities
- KT0104 Fundamentals of process measurement
- KT0105 Instrumentation and process control
- KT0106 Types of PPE and protection devices
- KT0107 Types of process plant technology
- KT0108 Troubleshooting procedures

Internal Assessment Criteria

- Describe the various types of equipment used in the chemical manufacturing process which may include pipes, valves, pumps, motors, fans, filters, compressors, reactor system, and tanks in terms of their features, functions and components
- Describe the mechanical equipment, electrical equipment, instrumentation and utilities used in the manufacturing process
- Describe the types and role of control systems in the chemical manufacturing process
- Illustrate by means of a sketch, the flow paths of materials through the plant in line with the principles of the process.
- Describe the common process technology used in the manufacturing process
- Explain the functions of chemical processing equipment
- Describe the types of materials used in the chemical manufacturing process in terms of their properties.
- Explain the purpose and fundamental principles of the process in terms of the feed materials and final product(s) produced
- Describe the properties of the final product(s) and by-product(s) produced in the chemical manufacturing process
- Explain the reasons for controlling a process
- Describe the different types of personal protective equipment and protective devices including safety equipment used in the chemical manufacturing process in terms of their functions
- Explain the consequences of non-adherence or using incorrect personal protective equipment in the workplace
- Describe the different types of equipment in terms of their uses and functionality
- Describe common process technologies used in the workplace
- Explain the operating procedures for process units and utilities

(Weight 100%)

KM-02-KT03: Maintaining good manufacturing practices (GMP) (30%)

Topic elements to be covered include:

- KT0101 Housekeeping principles and practices in chemical manufacturing process environment
- KT0102 Process requirements and processing characteristics
- KT0103 Manual and automated cleaning systems
- KT0104 Communication practices
- KT0105 Recordkeeping practices
- KT0106 Principles of teamwork

Internal Assessment Criteria

- Describe housekeeping requirements and responsibilities relating to own work, use and storage of cleaning equipment, waste handling according to GMP procedures
- Identify and describe the signs of unacceptable equipment condition
- Describe ways of handling and disposing waste and recyclable materials according to GMP requirements and organisational standard operating procedure
- Describe ways of handling conforming and non-conforming materials/products
- Describe storage and handling requirements for materials relevant to own work role in the workplace
- Explain the significance of adhering to safety standards when using materials, equipment and instruments in the work area in accordance with manufacturer's instructions
- Describe the characteristics of effective teamwork in the workplace and explain the operator's role in a team
- Describe the various types of hazards and risks associated with chemical manufacturing process and possible control measures in line with organisational standard operating procedures

(Weight 100%)

2.3 Provider Accreditation Criteria

Physical Requirements:

The provider should demonstrate access to:

- Classroom and furniture (chairs and tables, audio equipment and all other equipment conducive to a learning environment)
- Structured learning material and lesson plans that address all the topics specified in the scope statement of this module

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessors must have assessment expertise in terms of the subject matter related to this module
- Moderation of assessment processes must be a person with evaluative expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

2.4 Exemptions

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

3 713101000-KM-03, Legislation applicable in the chemical manufacturing process environment, NQF Level 3, 4 Credits

3.1 Purpose of the Knowledge Module

The main focus of the learning in this knowledge module is to build an understanding of the legislation applicable in the chemical manufacturing process environment and the importance of adhering to legislative and standard operating procedures in a chemical manufacturing process.

The learning will enable learners to demonstrate an understanding of:

- KM-03-KT01: Occupational health and safety in the workplace (70%)
- KM-03-KT02: Environmental considerations (30%)

3.2 Guidelines for Topics

3.2.1 KM-03-KT01: Occupational health and safety in the workplace (70%)

Topic elements to be covered include:

- KT0301 Occupational health and safety related legislation
- KT0302 Safety Data Sheet (SDS)
- KT0303 Standard Operating Procedures (SOP)/Work Instructions
- KT0304 Causes, prevention and control of fires
- KT0305 Hazard identification and risk assessment principles
- KT0306 Incident reporting
- KT0307 Emergency considerations

Internal Assessment Criteria and Weight

- Identify and list legislation applicable in the chemical manufacturing process environment and state how they affect own role in work context
- Explain the roles and responsibilities of employers and employees regarding safety, health and environmental practices in the workplace in terms of the applicable legislation and regulations
- Explain the functions of standard operating procedures generally applicable in the workplace and their importance
- Explain the consequences of non-compliance to safety, health and environmental legislative and regulatory requirements
- Explain the role and importance of adhering to standard operating procedures including lock-out procedures
- Explain the purpose of Safety Data Sheet (SDS) in the chemical manufacturing process environment
- Explain own role in process safety management on the chemical manufacturing process plant
- Identify and describe the potential risks and hazards in the chemical manufacturing process and associated control measures
- Explain the importance of a Work Permit in the chemical manufacturing process environment
- Identify and describe the various types of personal protective equipment in terms of their uses when working with chemicals
- Identify and describe the safety signs associated with hazards and risks and the importance of observing these when working with chemical manufacturing process equipment and process
- Identify and describe the different types of fires in terms of their characteristics and properties including fire protection systems and prevention or control measures
- Describe the site emergency system within the plant in relation to an emergency plan, and describe evacuation procedures in own context

- Identify and describe the possible accidents or incidents including their causes and explain the importance of reporting procedures in accordance with organisational requirements
- Explain the correct procedures in handling and transporting chemicals in accordance with the manufacturer's instructions and the Safety Data Sheet (SDS)
- Explain the basic hazards identification and risk assessment procedures in accordance with organisational policies and procedures

(Weight 100%)

3.2.2 KM-03-KT02: Environmental considerations (30%)

Topic elements to be covered include:

- KT0301 Concepts, principles and considerations
- KT0302 Different categories of waste
- KT0303 Pollution prevention and remedial methods
- KT0304 Different methods of waste disposal
- KT0305 Energy efficiency

Internal Assessment Criteria and Weight

- Define the terms associated with the natural environment including 'environment', 'natural resources', 'ecosystem', 'nature conservation', 'pollution', 'energy efficiency' and 'environmental sustainability'.
- Identify and describe the different types of waste associated with chemical manufacturing process and how these can be recycled and re-used and the impact of incorrect disposal of waste
- Explain the relevance of legislation to own work context
- Identify the types, sources of pollution and their impact in the environment and how to prevent and reduce pollution
- Identify and describe ways of saving energy in chemical manufacturing process

(Weight 100%)

3.3 Provider Accreditation Criteria

Physical Requirements:

The provider should demonstrate access to:

- Classroom and furniture (chairs and tables, audio equipment and all other equipment conducive to a learning environment)
- Structured learning material and lesson plans that address all the topics specified in the scope statement of this module

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessors must have assessment expertise in terms of the subject matter related to this module
- Moderation of assessment processes must be a person with evaluative expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

3.4 Exemptions

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

4 713101000-KM-04, Sampling and material testing in the chemical manufacturing process, NQF Level 2, 4 Credits

4.1 Purpose of the Knowledge Modules

The main focus of the learning in this knowledge module is to build an understanding of the basic principles and procedures for sampling and testing in accordance with standard operating procedures in chemical manufacturing process.

The learning will enable learners to demonstrate an understanding of:

- KM-04-KT01: Principles of sampling and material testing (100%)

4.2 Guidelines for Topics

4.2.1 KM-04-KT01: Principles of sampling and material testing (100%)

Topic elements to be covered include:

- KT0401 Types of sampling and testing apparatus
- KT0402 Sampling and testing procedures and frequencies

Internal Assessment Criteria and Weight

- Identify and describe the different types of samples taken in the chemical process environment in terms their purpose and sampling procedures
- Explain the purpose of sampling from the scientific and technical bases upon which sampling is based
- Identify and describe the different types of apparatus used for sampling and testing of materials in terms of their purpose, functions and features
- Identify and describe the various types of containers used to store samples in the chemical manufacturing process
- Explain the sampling procedure, its processing and frequency in accordance with organisational standard operating procedures
- Explain the factors that could impact on sample quality before, during and after sampling in accordance with organisational operating procedures

- Identify and explain reasons and consequences for any sampling deviations from standard operating procedures during sampling
- Describe the importance of maintaining health and safety during sampling in accordance with organisational operating procedures
- Explain the importance and methods for recording and reporting test results

(Weight 100%)

4.3 Provider Accreditation Criteria

Physical Requirements:

The provider should demonstrate access to:

- Classroom and furniture (chairs and tables, audio equipment and all other equipment conducive to a learning environment)
- Structured learning material and lesson plans that address all the topics specified in the scope statement of this module

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessors must have assessment expertise in terms of the subject matter related to this module
- Moderation of assessment processes must be a person with evaluative expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

4.4 Additional Assignments to be Assessed Externally

- None

4.5 Exemptions

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

SECTION 3B: PRACTICAL SKILL MODULE SPECIFICATIONS

List of Practical Skill Module Specifications

- 713101000-PM-01, Apply and maintain safety, health, environmental practices in chemical manufacturing process operations, NQF Level 2, 8 Credits
- 713101000-PM-02, Perform shift-handover and take-over procedures, NQF Level 1, 2 Credits
- 713101000-PM-03, Perform sampling and testing of materials, NQF Level 2, 8 Credits
- 713101000-PM-04, Handle and prepare chemicals for manufacturing as per plant requirements, NQF Level 2, 8 Credits
- 713101000-PM-05 Prepare and start-up equipment in a chemical manufacturing process, NQF Level 2, 10 Credits
- 713101000-PM-06, Monitor and control manufacturing processes, NQF Level 3, 16 Credits
- 713101000-PM-07, Planned and unplanned shutdown/stop of the process, NQF Level 2, 5 Credits
- 713101000-PM-08, Perform troubleshooting on equipment and process, NQF Level 3, 4 Credits

Total number of credits for Practical Skills Modules: 61

1. 713101000-PM-01, Apply and maintain safety, health, environmental practices in chemical manufacturing process operations, NQF Level 2, 8 Credits

1.1 Purpose Statement

The focus of the learning in this module is on providing the learner an opportunity to develop competencies in applying and maintaining safety, health and environmental practices in a chemical manufacturing process environment for legal compliance.

The learner will be required to:

- PS-01-PS01: Follow occupational health and safety procedures and legal requirements in chemical manufacturing process
- PS-01-PS02: Respond to emergencies in the workplace
- PS-01-PS03: Identify and report injuries in the workplace

1.2 Guidelines for Practical Skills

1.2.1 PS-01-PS01: Follow occupational health and safety procedures and legal requirements

Scope of Practical Skills

Given task instructions, different occupational health and safety related legislation, PPE, relevant documentation, Safety Data Sheet, relevant housekeeping equipment, the learner must be able to:

- PA0101: Identify potential hazards and risks associated with chemical manufacturing process
- PA0102: Apply relevant control measures to mitigate hazards and risks identified
- PA0103: Maintain good housekeeping in the work area

Applied Knowledge

- AKA101 Occupational health and safety legislation and regulations
- AKA102 Safety Data Sheet (SDS)
- AKA103 Housekeeping practices and methodologies
- AKA104 Hazardous Material Handling System
- AKA105 Hazards and risks identification process

Internal Assessment Criteria

- Given case scenarios, identify potential hazards and risks associated with the different chemical manufacturing process, and explain their impact on the health and safety of self and others
- Given case scenarios, environmental protection procedures are applied to maintain environmental safety and health using specified control measures in accordance with applicable legislation and regulations
- Given case studies or simulations, the identified hazards and risks are responded to applying the relevant corrective action to maintain a safe working environment in line with organisational standards and procedures.
- Relevant housekeeping methodologies and principles are described and applied to keep the work area clean to eliminate potential incidents/accidents
- Work area, materials, equipment and product are routinely monitored to ensure compliance with general manufacturing requirements and occupational health, safety and environmental requirements
- Materials and packaging components are handled according to general manufacturing requirements and workplace procedures
- Control measures in managing contamination and spillages are followed relating to work responsibilities and according to good manufacturing practices requirements
- Materials, product and packaging components are handled according to GMP and workplace procedures

(Weight 100%)

1.2.2 PS-01-PS02: Respond to emergencies in a chemical process environment

Scope of Practical Skills

Given task instructions, different occupational health and safety related legislation, different types of PPE, shift log/report, emergency evacuation plan, emergency evacuation procedures, Safety Data Sheet, relevant housekeeping equipment, the learner must be able to:

- PA0201: Obtain and familiarise self with the emergency plan and evacuation procedures
- PA0202: Participate in staff evacuation drills as per site requirements
- PA0203: Respond to an emergency situation.
- PA0204: Report an emergency or potential emergency situation

Internal Assessment Criteria

- Given case scenarios, site ground floor plan is described and access and exit routes are identified
- Given case scenarios, emergency escape procedures are accurately communicated to staff and others in accordance with legislative, OHS and organisational requirements and evacuation protocol
- Given case scenarios, emergency communication systems such as public-address system, portable radio unit or visual/audio alarms are used to notify the relevant responsible role-players such as the relevant supervisor and control room according to site specific standard operating procedures
- Given an emergency situation, correct response to that condition according to standard operating procedure
- Evacuation drills are conducted in accordance with organisational evacuation policy and procedures
- Feedback on evacuation implementation is responded to and any modifications to policy and procedures are communicated/followed up
- Given case scenarios, an emergency is documented in line with organisational standard operating procedures
- Given case scenarios, the required Safe Work permit procedures are identified and communicated to the relevant stakeholders for immediate action

(Weight 100%)

1.2.3 PS-01-PS03: Identify and report injuries in the workplace

Given task instructions, checklist, communication instruments/equipment, and relevant documentation the learner must be able to:

- PA0301: React to an injury incident
- PA0302: Report an incident to the relevant person

- PA0303: Monitor and support the injured person
- PA0304: Assist in the compilation of first-aid incident report

Applied Knowledge

- AK0301 Different types of injuries in the workplace
- AK0302 Organisational injury procedures
- AK0303 Reporting procedures and protocols
- AK0304 Communication tools and procedures.

Internal Assessment Criteria

- A simulated injury incident is reacted to in accordance with organisational emergency procedures
- Given a simulated injury incident, relevant communication tools are used to convey the incident to the relevant person to take appropriate action
- Given role play, an injured person is monitored and appropriate support is given until appropriate medical assistance is given.

(Weight 100%)

1.3 Provider Accreditation Criteria

Physical Requirements:

- The provider should allow access to all documents specified in the scope statement.
- Communication equipment
- Relevant personal protective equipment
- Housekeeping and safety equipment
- Chemical manufacturing plant.

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum experience of 2 years as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessments must be conducted by a subject matter expert with assessment expertise
- Moderation must be conducted by a subject matter expert with moderation expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

1.4 Additional Assignments to be Assessed Externally

- None

1.5 Exemptions

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

2. 713101000-PM-02, Perform shift-handover and take-over procedures, NQF Level 1, 2 Credits

2.1 Purpose Statement

The focus of the learning in this module is on providing the learner an opportunity to develop competencies in performing shift-hand-over and take-over responsibilities in a simulated environment.

The learner will be required to:

- PS-02-PS01 Apply shift-handover and take-over procedures at least three times

2.1 Guidelines for Practical Skills

2.1.1 PS-02-PS01 Apply shift-handover procedures at least three (3) times

Scope of Practical Skills

Given task instructions, manual or electronic shift hand-over log or report/register, the learner must be able to:

- PA0201 Prepare for shift-hand over
- PA0202 Perform and communicate shift hand-over activities

Applied Knowledge

- AK0201: Shift hand-over and take-over process and procedures
- AK0202: Different types of shift handover and take-over documentation if applicable.
- AK0203: Different types of chemical manufacturing process equipment.
- AK0204: Organisational standard operating procedures

Internal Assessment Criteria

- Relevant documentation is completed correctly for shift hand-over
- Using an observation checklist, a shift hand-over activity is carried out according to organisational standard operating procedures
- Issues are recorded and reported in order of importance using an established format in accordance with organisational standard operating procedures

(Weight 100%)

2.2 Provider Accreditation Criteria

Physical Requirements:

- The provider should demonstrate and permit access to all documents specified in the scope statement
- A manufacturing process plant
- Communication equipment
- Data recording tool

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessments must be conducted by a subject matter expert with assessment expertise
- Moderation must be conducted by a subject matter expert with moderation expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

2.3 Additional Assignments to be Assessed Externally

- None

2.4 Exemptions

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

3. 713101000-PM-03, Perform sampling and testing of materials, NQF Level 2, 8 Credits

3.1 Purpose of the Practical Skills

The focus of the learning in this module is on providing the learner an opportunity to perform sampling and testing of materials as per organisational procedures in a simulated work environment.

- PS-03-PS01: Prepare and conduct routine sampling of products
- PS-03-PS02: Prepare and test material

3.2 Guidelines for Practical Skills

3.2.1 PS-03-PS01: Conduct routine sampling of materials

Scope of Practical Skills

Given task instructions, sampling procedures, sampling schedule, sampling point, equipment including sample containers or holders, test-tubes, sample bags, required PPE, labels and marker pen), tools and sampling sheet, the learner must be able to:

Applied Knowledge

- AK0301 Sampling process and techniques
- AK0302 Different types of material samples
- AK0303 Health, safety and environmental standards and legal requirements
- AK0304 Sampling handling and storage procedures and frequencies

Internal Assessment Criteria

- Sampling points, tools and equipment are identified and selected in accordance with organisational procedures
- Using a given sample schedule/roster, sampling of material is conducted correctly and is within the specified timeframes, location, frequency and size according to the organisational procedures
- Sample collection procedures are carried out in accordance with organisational procedures

- Samples are labelled in accordance with organisational procedures including date, time, location, source, purpose and sampler
- Samples are handled, transported and stored in accordance with organisational procedures
- Sampling is documented according to organisational procedures

3.2.2 PS-03-PS02: Perform testing of materials

Given task instructions, relevant documentation, containers, testing methods and procedures, different types of materials, testing equipment including analytical test equipment, oven or moisture analyser, screens, viscosity equipment and relevant documentation, the learner must be able to:

- PA0301 Prepare work area and equipment for material testing
- PA0302 Select and verify the status of testing equipment to be used
- PA0303 Test materials while manufacturing
- PA0304 Determine and apply the appropriate testing method
- PA0305 Record and interpret testing results against specifications
- PA0306 Communicate test results using the relevant system and stakeholders
- PA0307 Store or discard samples of materials as per organisational procedures

Applied Knowledge

- AK0301 Material testing process and techniques
- AK0302 Different types of testing equipment
- AK0303 Health, safety and environmental standards and legal requirements

Internal Assessment Criteria

- Given task instructions, work area and equipment are prepared in accordance with organisational standard procedures for material testing purposes
- Appropriate testing method is applied and correct testing equipment is selected, and the status of equipment is verified in accordance with organisational standards procedures
- Using simulations, tests are conducted correctly while manufacturing and organisational work safety procedures are adhered to

- Test results are interpreted and recorded using a test sheet/log or shift sheet and communicated to the relevant stakeholders
- Samples are stored or discarded as per organisational standards procedures

(Weight 100%)

3.3 Provider Accreditation Criteria

Physical Requirements:

- The provider should demonstrate and permit access to all documents specified in the scope statement
- A manufacturing process plant
- Testing apparatus.
- Appropriate personal protective equipment

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessments must be conducted by a subject matter expert with assessment expertise
- Moderation must be conducted by a subject matter expert with moderation expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

3.4 Additional Assignments to be Assessed Externally

- None

3.5 Exemptions

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

4. 713101000-PM-04, Handle and prepare chemicals for manufacturing as per plant requirements, NQF Level 2, 8 Credits

4.1 Purpose of the Practical Skills Module

The focus of the learning in this module is on providing the learner an opportunity to be exposed to the processes of weighing, handling, transferring, storing materials as per standard organisational procedures in a simulated workplace environment.

The learner will be required to:

- PS-04-PS01: Handle and transfer/load materials

4.2 Guidelines for Practical Skills

4.2.1 PS-04-PS01: Handle and transfer materials

Scope of Practical Skills

Given task instructions, relevant documentation, different types of materials, weighing scale and relevant equipment the learner must be able to:

- PA0401: Perform pre-handling inspection
- PA0402: Identify, inspect and receive manufacturing materials
- PA0403: Prepare materials and equipment for measurement
- PA0404: Measure and/or label materials
- PA0405: Transfer ingredients and maintain supply to manufacturing line
- PA0406: Stack and/or store materials
- PA0407: Complete and communicate relevant documentation as per job requirements
- PA0408: Monitor and report stock levels

Applied Knowledge

- AK0401: Material measurement systems
- AK0402: Material handling management systems
- AK0403: Storage mechanisms or systems
- AK0404: Material transportation systems
- AK0505: Health, safety and environmental standards and legal requirements

Internal Assessment Criteria

- Work area is prepared for materials handling
- Material is received, identified and inspected to determine correctness and the delivery is confirmed in accordance with organisational standard operating procedures
- The equipment and materials are inspected, and electronic and manual measurements are checked and monitored
- Given the standard operating procedures, the accuracy of the measuring equipment is verified.
- The material is identified and measured correctly and meet the relevant specifications in accordance with organisational standard operating procedures
- A process of transferring materials is followed correctly to maintain supply to manufacturing line
- The materials are stacked and/or stored in accordance to organisational standard operating procedures and the level of manufacturing is maintained
- The stipulations of the SDS are observed and applied correctly when handling materials
- Material handling activities are documented and communicated as per job requirements and organisational standard operating procedures
- Stock levels are maintained in accordance with work instructions

(Weighting 100%)

4.3 Provider Accreditation Criteria

Physical Requirements:

- The provider should demonstrate and permit access to all documents specified in the scope statement
- Chemical manufacturing process plant, and testing apparatus
- Prescribed personal protective equipment
- Communication tools
- Data logging tool

- All chemical process equipment that may include, pumps, compressors, valves, heat exchangers, extruders, reactors, separators, vessels, distillation column, scrubbers, extractors, dryers, filters, fans etc.
- Processes that may include: drying, separation, transferring, distilling, compression, blending extruding, cracking, reactions and heat exchanging

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise;
- Assessments must be conducted by a subject matter expert with assessment expertise
- Moderation of assessments must be conducted by a subject matter expert with moderation expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

4.4 Additional Assignments to be Assessed Externally

- None

4.5 Exemptions

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

5. 713101000-PM-05 Prepare and start-up equipment in a chemical manufacturing process, NQF Level 2, 10 Credits

5.1 Purpose of the Practical Skills Module

The focus of the learning in this module is on providing the learner an opportunity to apply stages in the start-up procedure of designated chemical processing equipment within design parameters in a simulated environment.

The learner will be required to:

- PS-05-PS01: Prepare and start-up of chemical manufacturing process and equipment.

5.2 Guidelines for Practical Skills

5.2.1 PS-05-PS01: Prepare and start up chemical manufacturing process equipment

Scope of Practical Skills

The person will be expected to engage in the following work activities:

- PA0501 Identify and select the correct equipment for chemical manufacturing process
- PA0502 Conduct pre-start checks on equipment and facilities
- PA0503 Set up/line-up process equipment to required settings
- PA0504 Complete relevant documentation correctly
- PA0505 Identify and confirm the availability of utilities
- PA0506 Record checks and tests according to organisational operating procedures
- PA0507 Apply problem-solving techniques
- PA0508 Communicate information concerning checks and tests
- PA0509 Report emergency / process alarms.

Applied Knowledge

- AK0501: Start-up procedures
- AK0502: Manufacturer's specifications
- AK0503: Safety Data Sheet

- AK0504: Health, safety and environmental standards and regulations

Internal Assessment Criteria

- Pre-start checks on equipment, utilities and facilities are conducted to determine plant status and possible corrective action
- Process equipment is cleaned-up, set-up/lined-up to required standards
- The initial start-up procedures are applied to ensure a safe transfer to achieve normal operating mode
- Start-up procedures are adhered to correctly in accordance with the organisational operating procedures
- Equipment readings are interpreted and responded to using applicable data sources to optimise the start-up process
- Abnormalities or deviations on a process are identified, recorded and reported to the relevant person to ensure maintenance of product quality and process safety
- Problem-solving/corrective techniques are applied in response to discrepancies identified
- Relevant documentation is completed and stored correctly according to organisational operating guidelines
- Potential hazards during start-up of plant or process are identified and describe, and specific operating procedures to deal with eventualities are applied correctly.

5.3 Provider Accreditation Criteria

Physical Requirements:

- A chemical manufacturing plant and process
- Prescribed personal protective equipment
- Communication tools
- Data logging tool
- All chemical process equipment that may include: pumps, compressors, valves, heat exchangers, extruders, reactors, separators, vessels, distillation column, scrubbers, extractors, dryers, filters, fans, etc.
- Processes that may include: drying, separation, transferring, distilling, compression, blending extruding, cracking, reactions and heat exchanging

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessments must be conducted by a subject matter expert with assessment expertise
- Moderation of assessments must be conducted by a subject matter expert with moderation expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

5.4 Additional Assignments to be Assessed Externally

- None

5.5 Exemption

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

6. 71310100-PM-06, Monitor and control chemical manufacturing processes, NQF Level 3, 16 Credits

6.1 Purpose of the Practical Skills Module

The focus of the learning in this module is on providing the learner an opportunity to monitor and control chemical manufacturing processes to ensure quality conformance, report any deviations, and maintain the chemical process and equipment in a chemical manufacturing plant.

The learner will be required to:

- PS-06-PS01: Monitor and control plant process for functionality and adjust plant equipment

6.2 Guidelines for Practical Skills

6.2.1 PS-06-PS01 Monitor and control plant process for functionality and adjust plant equipment

Scope of Practical Skills

Given task instructions, process parameters, instruments such as pressure gauges, sampling instrument, checklist and manufacturing requirements the person must be able to:

- PA0601 Observe/inspect process during normal operations
- PA0602 Respond to non-conformances and deviations
- PA0603 Compare equipment readings with set parameters

Applied Knowledge

- AK0601: Monitoring processes
- AK0602: Monitoring tools and techniques

Internal Assessment Criteria

- Methods of monitoring the plant process are applied in accordance with organisational procedures
- Monitor equipment and identify process conformances and deviations maintaining safe work practices
- Critical areas to monitor are identified.
- Deviations are identified in accordance with organisational operating procedures

- Impact of deviations are described in order to apply corrective action
- Take appropriate action to address the identified non-conformances or deviation/s from set standards
- Equipment readings are compared with set parameters and changes in operation are determined and recorded in line with organisational standard operating procedures

(Weighting 100%)

6.3 Provider Accreditation Criteria

Physical Requirements:

- A chemical manufacturing plant and process
- Prescribed personal protective equipment
- Communication tools
- Data logging tool
- All chemical process equipment that may include: pumps, compressors, valves, heat exchangers, extruders, reactors, separators, vessels, distillation column, scrubbers, extractors, dryers, filters, fans etc.
- Processes that may include, drying, separation, transferring, distilling, compression, blending extruding, cracking, reactions and heat exchanging

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessments must be conducted by a subject matter expert with assessment expertise
- Moderation of assessments must be conducted by a subject matter expert with moderation expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

6.4 Additional Assignments to be Assessed Externally

- None

6.5 Exemption

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

7. 713101000-PM-07, Planned and unplanned shutdown/stop of the process, NQF Level 2, 5 Credits

7.1 Purpose of the Practical Skills Modules

The focus of the learning in this module is on providing the learner an opportunity to perform planned and unplanned shut down or stop of the process in a simulated work environment and to respond to abnormal/shutdown emergency conditions.

The learner will be required to:

- PS-07-PS01: Perform equipment shutdown/stop of the process for scheduled or unscheduled activities
- PS-07-PS02: Perform equipment shutdown/stop for abnormal/emergency conditions

7.2 Guidelines for Practical Skills

7.2.1 PS-07-PS01: Perform equipment shutdown/stop of the process for scheduled or unscheduled activities

- PA0701: Prepare the process for shutdown/stop as per schedule
- PA0702: Monitor the equipment shutdown process to confirm shutdown status
- PA0703: Shutdown and isolate equipment
- PA0704: Communicate the planned shutdown/stop to all relevant stakeholders

Applied Knowledge

- AK0701: Process shutdown/stop procedures
- AK0702: Communication channels in the workplace
- AK0703: Occupational health, safety and environmental standard requirements

Internal Assessment Criteria

- The equipment is monitored to confirm operating status
- The process is inspected and verified to ensure safe shutdown/stop conditions
- The process shutdown/stop is simulated, and proper shutdown/stop procedures are adhered to in accordance with the organisational operating procedures
- Status and availability of equipment is communicated to all relevant stakeholders using available communication channels

(Weighting 100%)

7.2.2 PS-07-PS02: Respond to abnormal/emergency shutdown/stop conditions

- PA0701: Recognise emergency conditions
- PA0702: Apply emergency shutdown procedures

Applied Knowledge

- AK0701: Operating parameters and requirements
- AK0702: Shutdown/stop standard operating procedures
- AK0703: Emergency stop procedures

Internal Assessment Criteria

- Abnormal points are identified and critical parameters are contained to meet manufacturing requirements
- Operating data and plant operating conditions are analysed to identify causes of abnormal performance
- Emergency conditions are recognised and responded to ensure safety of people and equipment following organisational procedures or protocol
- Emergency shutdown procedures are implemented as required according to organisational standard operating procedures and manufacturer's recommendations
- Corrective action is taken in response to hazards and abnormal plant performance in accordance with organisational standard operating procedures

(Weighting 100%)

7.3 Provider Accreditation Criteria

Physical Requirements:

- A chemical manufacturing plant and process
- Prescribed personal protective equipment
- Communication tools
- Data logging tool
- All chemical process equipment that may include: pumps, compressors, valves, heat exchangers, extruders, reactors, separators, vessels, distillation column, scrubbers, extractors, dryers, filters, fans etc.

- Processes that may include: drying, separating, transferring, distilling, compressing, blending extruding, cracking, reactions and heat exchanging

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessments must be conducted by a subject matter expert with assessment expertise
- Moderation of assessments must be conducted by a subject matter expert with moderation expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

7.4 Additional Assignments to be Assessed Externally

- None

7.5 Exemption

- No exemptions are currently recognised for any of the listed knowledge modules. An RPL approach is recommended for all listed knowledge modules.

8. 713101000-PM-08, Perform troubleshooting on equipment and process, NQF Level 3, 4 Credits

8.1 Purpose of the Practical Skills Modules

The focus of the learning in this module is on providing the learner an opportunity to identify equipment process failures and conduct troubleshooting on the equipment in a simulated environment.

The learner will be required to:

- PS-08-PS01: Carry out first-line/basic troubleshooting on the equipment and process

8.2 Guidelines for Practical Skills

8.2.1 PS-08-PS01: Carry out first-line/basic troubleshooting on the equipment and process issues

- PA0801: Identify variables deviating from the normal operating standards
- PA0802: Establish likely causes of the deviation or problem
- PA0803: Prioritise and eliminate possible causes to equipment and process failure
- PA0804: Confirm deviations and take appropriate action
- PA0805: Check the effect of corrective action
- PA0806: Record the corrective action taken

Applied Knowledge

- AK10801 Root-cause analysis
- AK10802 Prioritisation techniques

Internal Assessment Criteria

- Process variables are checked and compared to control limits
- Deviations from operating specifications are identified in accordance with standard operating procedures
- Likely causes of deviations are identified to determine the appropriate corrective action

- The most probable causes are recorded and prioritised using available resources or technologies indicating extent and location of the faults in an appropriate format
- Appropriate corrective action is applied to eliminate the problem
- The process is monitored to determine the impact of corrective action in accordance to standard operating procedures
- Actions taken are clearly documented in accordance with organisational operating procedures

(Weighting 100%)

8.3 Provider Accreditation Criteria

Physical Requirements:

- A Chemical manufacturing processes which may include: drying, separating, transferring, distilling, compressing, blending extruding, cracking, reactions and heat exchanging.
- Prescribed personal protective equipment
- Communication tools
- Data logging tool
- All chemical process equipment that may include, pumps, compressors, valves, heat exchangers, extruders, reactors, separators, vessels, distillation column, scrubbers, extractors, dryers, filters, fans etc.

Human Resource Requirements:

- Facilitator/instructor must have a qualification in chemical manufacturing process at NQF level 2 and at least minimum of 2 years experience as a subject matter expert in the chemical manufacturing process industry
- Facilitator/Instructor must be a subject matter expert with at least 5 years work experience with facilitation expertise
- Assessments must be conducted by a subject matter expert with assessment expertise
- Moderation of assessments must be conducted by a subject matter expert with moderation expertise

Legal Requirements

- Compliance with occupational health, safety and environmental legislative requirements

8.4 Additional Assignments to be Assessed Externally

- None

8.5 Exemptions

- No exemptions are currently recognised for any of the listed practical modules. An RPL approach is recommended for all listed practical modules.

SECTION 3C: WORKPLACE EXPERIENCE MODULES SPECIFICATIONS

List of Work Experience Modules Specifications

- 713101000-WM-01, Shift handover and take-over processes, NQF Level 1, 3 Credits
- 731101000-WM02, Material quality assurance processes, NQF Level 3, 8 Credits
- 713101000-WM-03, Handling and loading/transfer of materials processes, NQF Level 2, 8 Credits
- 713101000-WM-04, Equipment and plant setting-up, starting-up and adjusting processes, NQF Level 2, 8 Credits
- 713101000-WM-05, Monitoring and controlling manufacturing systems processes, NQF Level 3, 8 Credits
- 713101000-WM-06, Planned and unplanned equipment shutdown processes, NQF Level 2, 8 Credits

Total number of credits for Workplace Experience Modules: 43

1. 713101000-WM-01, Shift handover and take-over processes, NQF Level 1, 3 Credits

1.1. Purpose of the Work Experience

The focus of the learning in this module is on providing the learner an opportunity to gain exposure in the processes of performing and applying shift hand-over and take-over procedures in a real-life chemical manufacturing process environment.

The learner will be required to:

- WM-WE-01-01 Observe and assist a qualified person in the processes of conducting shift-handover and take-over
- WM-WE-01-02 Perform shift-handover and take-over activities autonomously, but under the direct supervision of a qualified person

1.2 Guidelines for Work Experience

1.2.1 WE-01-01 Observe and assist a qualified person in the processes of shift-handover and take-over

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Participate in an induction program
- WA0102 Prepare for shift-hand over on the plant
- WA0103 Communicate shift activities to ensure understanding of plant status

Supporting Evidence

- SE0101 Completed shift logbook /sheet or Observation Sheet signed-off and dated manually or electronically by the supervisor and the learner
- SE0102 Attendance register for induction training

1.2.2 WE-01-02 Perform shift-handover and take-over activities under the direct supervision of a qualified person at least three times

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Prepare for shift-hand over of chemical manufacturing process
- WA0102 Communicate shift activities to ensure understanding of plant status

Supporting Evidence

- SE0101 Completed shift logbook /sheet or Observation Sheet signed-off and dated manually or electronically by the supervisor and the learner

1.3 Contextualised Workplace Knowledge

- Shift hand-over and take-over log sheet or observation sheet
- ISO 9002 and 14001 and OSHAS 18000 standards and applications
- Location of information on the hazards
- Standard operating procedures
- Organisational practices, policies and procedures
- Shift handover process
- Layout of the plant equipment and utilities
- Process flow in the chemical plant and utilities
- Efficiency settings of machines and equipment
- Product knowledge and identification

1.4 Criteria for Workplace Approval

Physical Requirements:

- A chemical process
- Prescribed personal protective equipment
- Communication tools
- Data logging tool
- All chemical process equipment that may include: pumps, compressors, valves, heat exchangers, extruders, reactors, separators, vessels, distillation column, scrubbers, extractors, dryers, filters, fans etc.
- Processes that may include, drying, separation, transferring, distilling, compression, blending extruding, cracking, reactions and heat exchanging

Human Resource Requirements:

- The supervisor must be a subject matter expert in chemical operations
- Supervisor/subordinate ratio of 1:10 Maximum

- Coach/learner ratio of 1:1
- Mentor/learner ratio of 1:5 Maximum

Legal Requirements:

- Compliance with Occupational Health and Safety Act

Additional Assignments to be Assessed Externally

- None

2 713101000-WM-02, Material quality control processes, NQF Level 3, 16 Credits

2.1 Purpose of the Workplace Experience

The focus of the work experience is on providing the learner an opportunity to gain exposure in the processes of sampling material and perform testing for quality control data and records in the chemical manufacturing process industry.

The learner will be required to engage in the following work activities:

- WM-02- WE01: Observe and assist a qualified person in the processes of conducting routine sampling and testing of materials
- WM-02-WE02: Conduct routine sampling and testing of materials autonomously, but under the direct supervision of a qualified person

2.2 Guidelines for Work Experiences

2.2.1 WM-02- WE01: Observe and assist in the performance of routine sampling and testing of materials

- WA0101 Identify and select correct sampling equipment or method
- WA0102 Prepare sampling equipment for sampling
- WA0103 Perform sampling procedures
- WA0104 Complete relevant sampling documentation
- WA0105 Perform regular equipment inspection to prevent equipment failures
- WA0106 Maintain safe work practices while sampling materials
- WA0107 Receive and label samples of materials for testing
- WA0108 Determine the appropriate testing method
- WA0109 Select and prepare appropriate testing equipment
- WA0110 Conduct testing as per organisational procedures
- WA0111 Interpret, record and compare testing results against specification
- WA0112 Communicate test results using the relevant system
- WA0113 Store or discard samples of materials as per organisational procedures

Supporting Evidence

- SE0201 Completed checklist of sampling and/or tests according to organisational procedures signed-off and dated by both the supervisor/mentor and the learner

- SE0202 Completed Sampling and/or tests Logsheet/ Process Chart/sampling or tests record signed-off and dated by both the supervisor/mentor and the learner

2.2.3 WM-02-WE02: Conduct routine sampling and testing of materials autonomously, but under supervision

- WA0201 Identify and select correct sampling and testing equipment or method
- WA0202 Prepare sampling equipment for sampling
- WA0203 Perform sampling and/or testing according to organisational procedures
- WA0204 Complete sampling documentation
- WA0205 Perform regular equipment inspection to prevent equipment failures
- WA0206 Maintain safe work practices while sampling and/or testing materials
- WA0207 Receive and label samples of materials for testing
- WA0208 Interpret, record, compare and communicate testing results against specification, where applicable

Supporting Evidence

- SE0201 Record of samples and tests/Inventory of samples and tests
- SE0202 Record/Log of testing results, where applicable
- SE0203 Completed checklist of organisational procedure on sampling and/or testing signed-off and dated by both the supervisor/mentor and the learner, where applicable

2.3 Contextualised Knowledge

- Organisational policies and procedures
- Sampling and/or testing documentation
- Safety, Health, Environmental and Quality legislation

2.4 Criteria for Workplace Approval

Physical Requirements:

Access to the following Equipment:

- Personal protective equipment
- Relevant sampling, consumables and testing equipment

Human Resource Requirements:

- The supervisor must have NQF Level 2 qualification or a qualified subject matter expert in related chemical manufacturing process field
- Supervisor/subordinate ratio 1:10 Maximum
- Coach/learner ratio of 1:5 Maximum
- Mentor/learner ratio of 1:5 Maximum

Legal Requirements:

- Compliance with Occupational Health and Safety Act, NEMA, ISOE's quality and environment, SCM Act

2.5 Additional Assignments to be Assessed Externally

- None

3 713101000-WM-03, Materials handling and loading/transferring processes, NQF Level 2, 16 Credits

3.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to be exposed to the processes of measuring, handling, transferring and storing materials as per standard organisational procedures under supervision.

The learner will be required to:

- WM-03-WE01: Observe and assist in the process of handling and transferring/loading materials
- WM-03-WE02: Handle and transfer/load materials under supervision

3.2 Guidelines for Work Experiences

3.2.1 WM-03-WE01: Observe and assist in the process of handling and transferring materials

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101: Receive and inspect the materials to be handled or transferred.
- WA0102: Prepare materials for measurement
- WA0103: Complete moving machinery checklist
- WA0104: Measure and/or label materials
- WA0105: Transfer materials and maintain supply to manufacturing line
- WA0106: Stack and/or store materials
- WA0107: Complete relevant documentation as per job requirements
- WA0108: Conduct post-handling and loading/transferring processes

Supporting Evidence

- SE0101: Measuring/labelling system verification document
- SE0102: Completed moving machinery checklist
- SE0103: Relevant stores and/or dispatch document
- SE0104: Released batch/Quality Control Certificate
- SE0105: Copy of Safety Data Sheet

3.2.2 WM-03-WE02: Handle and transfer materials autonomously, but under supervision

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101: Receive and inspect the materials to be handled or transferred.
- WA0102: Prepare materials for weighing
- WA0103: Complete moving machinery checklist
- WA0104: Measure and/or label materials
- WA0105: Transfer materials and maintain supply to manufacturing line
- WA0106: Stack and/or store materials
- WA0107: Complete relevant documentation as per job requirements
- WA0108: Conduct post-handling and loading/transferring processes

Supporting Evidence

- SE0101: Measuring/labelling system verification document
- SE0102: Completed moving machinery checklist

3.3 Contextualised Workplace Knowledge

- Industry specific policies and procedures
- Standard operating procedures
- Layout and function of the process equipment and utilities
- Process flow in the chemical manufacturing and utilities
- Material knowledge and identification

3.4 Criteria for Workplace Approval

Physical Requirements:

Access to the following Tools:

- Receiving or dispatching tools
- Personal protective equipment
- Spanners, dip sticks, measuring tapes, spades, cleaning tools and containers

Access to the following Equipment where applicable:

- Transporting and lifting equipment, measuring equipment, packaging and storage equipment
- Communication tools

Human Resource Requirements:

- The supervisor must have NQF Level 2 qualification or a qualified subject matter expert in related chemical manufacturing process field
- Supervisor/subordinate ratio of 1:10
- Coach/learner ratio of 1:1
- Mentor/learner ratio of 1:5

Legal Requirements:

- Compliance with Occupational Health and Safety Act, National Environmental Management Act, ISOE's-quality and environment

3.5 Additional Assignments to be Assessed Externally

- None

4 713101000-WM-04, Equipment and plant setting-up, starting-up, and adjusting processes, NQF Level 2, 8 Credits

4.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to apply stages in the start-up and adjust procedures of designated chemical processing equipment within design parameters and applicable legislative requirements whilst identifying and responding to abnormal start up conditions at least three times.

The learner will be required to:

- WM-04-WE01: Observe and assist in the preparation, setting-up, starting-up chemical manufacturing process and equipment
- WM-04-WE02: Adjust, set-up and start plant equipment under supervision

4.2 Guidelines for Work Experiences

4.2.1 WM-04-WE01: Observe and assist in the preparation, setting-up and starting-up chemical manufacturing process and equipment

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Identify the correct equipment
- WA0102 Identify and interpret plant equipment information
- WA0103 Identify and conduct pre-start checks on equipment and facilities
- WA0104 Read and interpret equipment readings in chemical processing
- WA0105 Set-up process equipment to required settings
- WA0106 Complete relevant documentation correctly
- WA0107 Identify and confirm the availability of utilities
- WA0108 Record tests, checks and readings according to standard operating procedures
- WA0109 Compare equipment readings with set parameters to determine changes in operation.
- WA0110 Communicate information concerning checks and tests
- WA0111 Identify, correct and report possible non-conforming conditions

- WA0112 Report emergency or process alarms.

Supporting Evidence

- SE0101 Completed plant equipment checklist
- SE0102 Relevant plant process document
- SE0103 Copy of checklist of organisational procedures signed-off
- SE0104 Clearance certificate/Permits
- SE0105: Lab results, Defect / Job request document

4.2.2 WM-04-WE02: Adjust, set up and start plant equipment under supervision

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Identify the correct equipment
- WA0102 Identify and interpret plant equipment information
- WA0103 Identify and conduct pre-start checks on equipment and facilities
- WA0104 Read and interpret equipment readings in processing equipment
- WA0105 Set-up process equipment to required settings
- WA0106 Complete relevant documentation correctly
- WA0107 Identify and confirm the availability of utilities
- WA0108 Record tests, checks and readings according to standard operating procedures
- WA0109 Compare equipment readings with set parameters to determine changes in operation.
- WA0110 Communicate information concerning checks and tests
- WA0111 Identify, correct and report possible fault conditions
- WA0112 Report emergency or process alarms.

Supporting Evidence

- SE0101 Completed plant equipment checklist
- SE0102 Relevant plant process document

- SE0103 Copy of checklist of organisational procedures signed-off
- SE0104 Clearance certificate/Permits
- SE0305: Lab results, Defect / Job request document

4.3 Contextualised Workplace Knowledge

- Standard operating procedures
- Layout of the equipment and utilities
- Process flow in the chemical plant and utilities
- Product knowledge and identification
- Problem-solving documentation, where applicable
- Relevant documentation and legislation including SHEQ legislation

4.4 Criteria for Workplace Approval

Physical Requirements:

Access to the following Equipment:

- Personal protective equipment
- Valve spanners
- Hoses
- Analysers
- Computer
- Transferring Equipment such as conveyors and pumps
- Communication equipment such as radios and alarms
- Process equipment such as instrumentation and control valve, etc.
- At least one chemical process
- Processes that may include but not limited to: fuel systems, cooling systems, distillations, steam systems, screening systems, filtration systems, dosing systems, power systems.

Human Resource Requirements:

- The supervisor must have NQF Level 2 qualification or a qualified subject matter expert in related chemical manufacturing process field
- Supervisor/subordinate ratio of 1:10 Maximum
- Coach/learner ratio of 1:1
- Mentor/learner ratio of 1:5 Maximum

Legal Requirements:

- Compliance with Occupational Health and Safety Act, NEMA, ISOE's quality and environment, SCM Act

4.5 Additional Assignments to be Assessed Externally

- None

5. 71310100-WM-05, Monitoring and controlling chemical manufacturing processes, NQF Level 3, 16 Credits

5.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to:

Monitor and control chemical manufacturing processes to ensure quality conformance and report any deviations and maintain the chemical process and equipment safely in a chemical plant under the supervision.

The learner will be required to:

- WM-05-WE02: Monitor and control plant equipment for functionality
- WM-05-WE03: Maintain safe work practices to ensure the safety of people, equipment, materials and the environment

5.2 Guidelines for Work Experiences

5.2.1 WM-05-WE01: Monitor and control plant equipment for functionality

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0201 Inspect equipment during normal and abnormal operation.
- WA0202 Monitor equipment and process to identify non-conformances and deviations.
- WA0203 Identify non-conformances and deviations and apply appropriate corrective action or report to the relevant stakeholders for corrective action.

Supporting Evidence

- SE0201 Completed plant log sheets/checklist and organisational operating procedures signed-off and dated by the supervisor/mentor and the learner
- SE0202 Completed deviation and corrective action reports.
- SE0203 Completed Observation Checklist specific chemical process or a copy of the checklist of the organisational procedures signed-off and dated by the supervisor/mentor and the learner

5.2.2 WM-05-WE03: Maintain safe work practices during the monitoring and controlling of manufacturing processes

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0301 Participate in safety induction program
- WA0302 Complete lock out and tagging procedures
- WA0303 Participate in fire and safety training
- WA0304 Participate in mock emergency exercises
- WA0305 Participate in hazards identification and risk analysis for equipment safety
- WA0306 Operate and control the equipment/process safely within set parameters under supervision

Supporting Evidence

- SE0301 Attendance register and topic covered for safety induction
- SE0302 Lock out and tagging record
- SE0303 Fire and safety training attendance register
- SE0304 Mock emergency exercises attendance register
- SE0305 Attendance register on HIRA/PDA/HAZOP equipment safety and risk analysis process
- SE0406 Declaration of competence in safe making of equipment by the supervisor

Contextualised Workplace Knowledge

- Hand over logs and log items in the plant/process
- ISO 9002 and 14001 and OSHAS 18000 principles and applications
- Location of information on the hazards
- Standard operating procedures
- Organisational practices, policies and procedures
- Shift handover process
- Layout of the plant equipment and utilities

- Process flow in the chemical plant and utilities
- Efficiency settings of machines and equipment
- Product knowledge and identification
- Root cause analyses and fault-finding process manual
- Maintenance procedures

5.3 Criteria for Workplace Approval

Physical Requirements:

- Prescribed personal protective equipment
- Communication tools
- Data logging tool
- All chemical process equipment that may include: pumps, compressors, valves, heat exchangers, extruders, reactors, separators, vessels, distillation column, scrubbers, extractors, dryers, filters, fans etc.
- At least one chemical process
- Processes that may include: drying, separation, transferring, distilling, compression, blending extruding, cracking, reactions and heat exchanging

Human Resource Requirements:

- The supervisor is a SME in chemical operations
- Supervisor/subordinate ratio of 1:15
- Coach/learner ratio of 1:1
- Mentor/learner ratio of 1:4

Legal Requirements:

- Compliance with Occupational Health and Safety Act, Basic Conditions of Employment Act, Employment Equity Act, Labour Relations Act

5.4 Additional Assignments to be Assessed Externally

- None

6. 713101000-WM-06, Planned and unplanned equipment shutdown procedures, NQF Level 2, 12 Credits

6.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to performing planned and unplanned shut down chemical processing equipment within design parameters and applicable legislative requirements including SHE procedures during plant shutdown to minimise the impact on people and/or environment and or process plant.

The learner will be required to:

- WM-06-WE01: Observe and assist a qualified person in the processes of performing equipment planned or unplanned shutdown
- WM-06-WE02: Perform equipment shutdown for unplanned maintenance, under supervision

6.2 Guidelines for Work Experience

6.2.1 WM-06-WE01: Observe and assist a qualified person in the processes of performing equipment planned or unplanned shutdown

- WA0601: Shutdown and isolate equipment
- WA0602: Prepare for maintenance
- WA0603: Obtain safe work permit
- WA0604: Render equipment safe and suitable for planned or unplanned shutdown
- WA0605: Communicate the planned maintenance shutdown to all relevant stakeholders
- WA0606: Inspect and verify plant condition

6.2.2 WM-06-WE02: Perform equipment shutdown for unplanned maintenance, under supervision

- WA0601: Shutdown and isolate equipment
- WA0602: Prepare for maintenance
- WA0603: Obtain safe work permit
- WA0604: Render equipment safe and suitable for unplanned shutdown

- WA0605: Communicate the planned maintenance shutdown to all relevant stakeholders
- WA0606: Inspect and verify plant condition

6.3 Contextualised Workplace Knowledge

- ISO 9002 and 14001 and OSHAS 18000 standards and applications
- Location of information on the hazards
- Standard operating procedures
- Organisational practices, policies and procedures
- Process flow in the chemical plant and utilities

6.4 Criteria for Workplace Approval

Physical Requirements:

Access to the following Equipment:

- Process equipment such as: Pipes, valves, pumps, blowers, reactors, compressors, heat exchangers, cooling towers, distillation units, vessels, centrifuges
- Basic company specific maintenance tools

Access to any of the following processes:

- Blending
- Separation
- Heating
- Cooling
- Drying
- Extruding
- Distillation
- Leaching
- Compression

Human Resource Requirements:

- The supervisor is a chemical process specialist
- Supervisor/subordinate ratio of 1:5 Maximum
- Coach/learner ratio of 1:1
- Mentor/learner ratio of 1:5 Maximum

Legal Requirements:

- Compliance with Occupational Health and Safety Act

6.5 Additional Assignments to be Assessed Externally

- None