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 **REPUBLIC OF KENYA**

**COMPETENCY BASED CURRICULUM**

**FOR**

**OIL PIPELINE OFFICER**

**LEVEL 5**



 TVET CDACC

 P.O. BOX 15745-00100

 NAIROBI

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FOREWORD

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) in conjunction with the Oil and Gas Pipeline Sector Skills Advisory Committee (SSAC) and the Kenya Pipeline Company (KPC) have developed this competency-based oil and gas pipeline curriculum. The curriculum will allow the trainee to gain competency in oil pipeline fire safety.

This curriculum is designed and organised with a clear outline of learning outcomes, specific learning outcomes, suggested delivery methods, training/learning resources and methods of assessing the trainee’s achievement. The curriculum is competency-based, allowing for trainee’s exit to the world of work and easy re-entry to the course.

I am grateful to the staff of TVET CDACC, council technical committee members, course panel members at KPC, Oil and Gas Pipeline SSAC members and all those who participated in the development and production of this curriculum.

**Prof CHARLES M.M. ONDIEKI, PhD, FIET (K), Con. EngTech.**

**CHAIRMAN TVET CDACC**

PREFACE

Kenya, through the Ministry of Education, chairs the human resource capacity building cluster of the Northern Corridor Integration Projects involving the partner states of Kenya, Uganda, South Sudan, Ethiopia and Rwanda. This cluster aims at building capacity for the railways, energy, petroleum and information and communication technology (ICT) sectors.

This curriculum has been developed as part of the effort to build human resource capacity for oil and gas pipelines for the Northern Corridor Integration Projects. The curriculum is competency- based and market-driven, as it has been developed in collaboration with industry players through the Oil and Gas Pipeline Sector Skills Advisory Committee.

It is my conviction that the implementation of this curriculum will play a great role towards the training of competent oil pipeline fire officers needed not only for the implementation of Northern Corridor Integration Projects, but also for the oil and gas pipeline sector as a whole. The Technical and Vocational Education and Training Authority (TVETA) will quality assure programmes launched under this CBET curriculum.

**DIRECTOR, TECHNICAL TRAINING MINISTRY OF EDUCATION**

**ACKNOWLEDGEMENT**

In developing this curriculum, significant involvement and support was received from various persons and organisations to make it inclusive in terms of content for the benefit of all who will use it. The curriculum has been designed for competency- based training and has independent units of competence that allow the trainee flexibility in entry and exit.

I take this opportunity to acknowledge the Kenya Pipeline Company (KPC) board of directors and management for initiating and supporting the process of developing this curriculum.

The TVET CDCC recognizes with appreciation the role of the Oil and Gas Pipeline Sector Skills Advisory Committee (SSAC) in ensuring that competencies required by the industry are addressed in the curriculum. We also sincerely thank all stakeholders in the oil and gas pipeline sector for their valuable input and all those who participated in the process of developing this curriculum.

We are convinced that this curriculum will go a long way in ensuring that the workers in the oil and gas pipeline sector acquire competencies that will enable them to perform their work more efficiently.

**Dr LAWRENCE GUANTAI M’ITONGA, PhD**

**COUNCIL SECRETARY/CEO**

**TVET CDACC**

**ACRONYMS**

ANSI American National Standards Institute

BS British Standard

CDACC Curriculum Development, Assessment and Certification Council

CU Curriculum

DCP Dry Chemical Powder

ERP Emergency Response Plan/Procedure

FHA Fire Hazard Analysis

FO Fire Officer

ICS Incident Command System

ISO International Standards Organisation

JSA Job Safety Analysis

KNQF Kenya National Qualifications Framework

OG Oil and Gas

OHSAS Occupational Health and Safety Assessment Systems

OSHA Occupational Safety and Health Act

P&ID Piping and Instrumentation Drawings

PPE Personal Protective Equipment

PTW Permit to Work

SHE Safety, Health and Environment

KEY TO UNIT CODE

 OG/CU /FO/CR /01/5 / A

Industry or sector

Occupational Standards

Occupational area

Type of competency

Competency number

Competency level

Version control

**Table of Contents**

[FOREWORD iii](#_Toc29942287)

[PREFACE iv](#_Toc29942288)

[ACKNOWLEDGEMENT v](#_Toc29942289)

[ACRONYMS vi](#_Toc29942290)

[KEY TO UNIT CODE vii](#_Toc29942291)

[COURSE OVERVIEW ix](#_Toc29942292)

[BASIC UNITS OF LEARNING 12](#_Toc29942293)

[COMMUNICATION SKILLS 13](#_Toc29942294)

[NUMERACY SKILLS 16](#_Toc29942295)

[DIGITAL LITERACY 21](#_Toc29942296)

[ENTREPRENEURIAL SKILLS 24](#_Toc29942297)

[EMPLOYABILITY SKILLS 27](#_Toc29942298)

[ENVIRONMENTAL LITERACY 32](#_Toc29942299)

[OCCUPATIONAL SAFETY AND HEALTH PRACTICES 35](#_Toc29942300)

[CORE UNITS OF LEARNING 38](#_Toc29942301)

[CONDUCTING FIRE SAFETY TRAINING 39](#_Toc29942302)

[MONITORING FIRE SAFETY MANAGEMENT IN THE PREMISES 43](#_Toc29942303)

[SUPERVISING FIRE-FIGHTERS AND FIRE WARDENS IN THE WORKPLACE 48](#_Toc29942304)

[CONTAINING WORKPLACE FIRE EMERGENCIES (INCIDENTS AND ACCIDENTS) 52](#_Toc29942305)

[CONDUCTING FIRE INCIDENTS AND ACCIDENTS INVESTIGATION 61](#_Toc29942306)

[CONDUCTING WORKPLACE FIRE RISK ASSESSMENT 66](#_Toc29942307)

[MAINTENANCE OF FIRE-FIGHTING EQUIPMENT AND MATERIALS MAINTENANCE 72](#_Toc29942308)

**COURSE OVERVIEW**

The course takes 1580 hours, translating to 53 weeks of 30 hours each. It is designed for oil and gas sector personnel and those working in fire service departments and holds at least a fire engineering certificate or equivalent from recognized learning institutions. The course allows a trainee to work in a fire safety service in the oil and gas and other industries.

This course consists of the following basic, common and core units of learning:

**Basic Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit factor** |
| OG/CU/FO/BC/01/5/A | Communication skills | 25 | 2.5 |
| OG/CU/FO/BC/02/5/A | Numeracy skills | 40 | 4.0 |
| OG/CU/FO/BC/03/5/A | Digital literacy | 45 | 4.5 |
| OG/CU/FO/BC/04/5/A | Entrepreneurial skills | 70 | 7 |
| OG/CU/FO/BC/05/5/A | Employability skills | 50 | 5 |
| OG/CU/FO/BC/06/5/A | Environmental literacy | 25 | 2.5 |
| OG/CU/FO/BC/07/5/A | Occupational safety and health practices | 25 | 2.5 |
| **Total** | **280** | **28.0** |

**Core Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit of Learning Code** | **Unit of Learning Title** | **Duration in Hours** | **Credit Factors** |
| OG/CU/FO/CR/01/5/A | Conducting fire safety training | 160 | 16 |
| OG/CU/FO/CR/02/5/A | Monitoring fire safetymanagement in the premises | 150 | 15 |
| OG/CU/FO/CR/03/5/A | Supervising fire-fighters and firewardens in the workplace | 140 | 14 |
| OG/CU/FO/CR/04/5/A | Containing workplace fireemergencies(incidents/accidents) | 120 | 12 |
| OG/CU/FO/CR/05/5/A | Conducting workplace fireincidents/accidents investigation | 140 | 14 |
| OG/CU/FO/CR/06/5/A | Conducting workplace fire riskassessment | 120 | 12 |
| OG/CU/FO/CR/07/5/A | Maintenance of fire-fightingequipment and materials | 110 |
|  | Industrial attachment  | 360 |
| **Total** | **1300** | **130** |
| **Grand total**  | **1580**  | **158** |

The total duration of the course is 1580 hours including 360 hours’ industrial attachment.

**Entry Requirements**

A trainee entering this course should have any of the following minimum requirements:

1. Kenya Certificate of Secondary Education (KCSE) D (Plain)

**Or**

1. Equivalent qualification as determined by Kenya National Qualifications Authority (KNQA)

**Provision for industrial attachment**

It is envisaged that the trainee will have unfettered access to a fire safety service as a pre-requisite for admission into this training course.

**Assessment**

The course will be assessed at two levels: internally and externally. Internal assessment is continuous and is conducted by the trainer who is monitored by an internal verifier; while external assessment is the responsibility of TVET CDACC.

**Certification**

These units of learning can be done independently. On demonstration of competence in a unit of learning, a trainee will be awarded a Record of Achievement. Finally, on demonstration of competence in all the units of learning, the trainee will be awarded a Certificate in Oil Pipeline Fire Officer. The certificates will be awarded by TVET CDACC in conjunction with the training provider.

**BASIC UNITS OF LEARNING**

**COMMUNICATION SKILLS**

**UNIT CODE: OG/CU/FO/BC/01/5/A**

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Demonstrate communication skills

**Duration of Unit:** 25hours

**Unit Description**

This unit describes the competencies required to use specialized communication skills to meet specific needs of internal and external clients, conduct interviews, facilitate discussion with groups and contribute to the development of communication strategies.

**Summary of Learning Outcomes**

1. Meet communication needs of clients and colleagues
2. Contribute to the development of communication strategies
3. Conduct interviews
4. Facilitate group discussions
5. Represent the organization

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Meet communication needs of clients and colleagues
 | * Communication process
* Modes of communication
* Medium of communication
* Effective communication
* Barriers to communication
* Flow of communication
* Sources of information
* Organizational policies
* Organization requirements for written and electronic communication methods
* Report writing
* Effective questioning techniques (clarifying and probing)
* Workplace etiquette
* Ethical work practices in handling communication
* Active listening
* Feedback
* Interpretation
* Flexibility in communication
 | * Observation
* Oral
 |
| 1. Contribute to the development of communication strategies
 | * Dynamics of groups
* Styles of group leadership
* Openness and flexibility in communication
* Communication skills relevant to client groups
 | * Written
* Observation
 |
| 1. Conduct interviews
 | * Types of interview
* Establishing rapport
* Facilitating resolution of issues
* Developing action plans
 | * Written
* Observation
 |
| 1. Facilitate group discussions
 | * Identification of communication needs
* Dynamics of groups
* Styles of group leadership
* Presentation of information
* Encouraging group members participation
* Evaluating group communication strategies
 | * Written
* Observation
 |
| 1. Represent the organization
 | * Presentation techniques
* Development of a presentation
* Multi-media utilization in presentation
* Communication skills relevant to client groups
 | * Observation
* Written
 |

**Suggested Delivery Methods**

* Interview
* Role playing
* Observation
* Viewing of related videos

**Recommended Resources**

* Desktop computers/laptops
* Internet connection
* Projectors
* Telephone

# NUMERACY SKILLS

**UNIT CODE:** **OG/CU/FO/BC/02/5/A**

**Relationship to Occupational Standards:**

This unit addresses the unit of competency: Demonstrate numeracy skills

**Duration of Unit:** 40 hours

**Unit Description**

This unit covers the competencies required to perform numerical functions. The person who is competent in this unit shall be able to: Calculate with whole numbers and familiar fractions, decimals and percentages for work; Estimate, measure, and calculate with routine metric measurements for work; Use routine maps and plans for work; Interpret, draw and construct 2D and 3D shapes for work; Interpret routine tables, graphs and charts for work; Collect data and construct routine tables and graphs for work; and Use basic functions of calculator

**Summary of Learning Outcomes**

1. Calculate with whole numbers and familiar fractions, decimals and percentages for work
2. Estimate, measure and calculate with routine metric measurements for work
3. Use routine maps and plans for work
4. Interpret, draw and construct 2D and 3D shapes for work
5. Interpret routine tables, graphs and charts for work
6. Collect data and construct routine tables and graphs for work
7. Use basic functions of calculator

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| Learning Outcome | Content | Suggested Assessment Methods |
| 1. Calculate with whole numbers and familiar fractions, decimals and percentages for work | * + Interpretation of whole numbers, fractions, decimals, percentages and rates
	+ Calculations involving several steps
	+ Calculation with whole numbers and routine or familiar fractions, decimals and percentages
	+ Conversion between equivalent forms of fractions, decimals and percentages
	+ Application of order of operations to solve multi-step calculations
	+ Application of problem solving strategies
	+ Making estimations to check reasonableness of problem solving process, outcome and its appropriateness to the context and task
	+ Use of formal and informal mathematical language and symbolism to communicate the result of a task
 | * Oral
* Written
* Practical test
* Observation
 |
| 2. Estimate, measure and calculate with routine metric measurements for work | * Selection and interpretation of measurement information in workplace tasks and texts
* Identification and selection of routine measuring equipment
* Estimation and making measurements using correct units
* Estimation and calculation using routine measurements
* Performing conversions between routinely used metric units
* Using problem solving processes to undertake tasks
* Recording information using mathematical language and symbols
 | * Oral
* Written
* Practical test
* Observation
 |
| 3. Use routine maps and plans for work | * Identification of features in routine maps and plans
* Symbols and keys used in routine maps and plans
* Identification and interpretation of orientation of map to North
* Demonstrate understanding of direction and location
* Apply simple scale to estimate length of objects, or distance to location or object
* Give and receive directions using both formal and informal language
 | * Oral
* Written
* Practical test
* Observation
 |
| 4. Interpret, draw and construct 2D and 3D shapes for work | * Identify two dimensional shapes and routine three dimensional shapes in everyday objects and in different orientations
* Explain the use and application of shapes
* Use formal and informal mathematical language and symbols to describe and compare the features of two dimensional shapes and routine three dimensional shapes
* Identify common angles
* Estimate common angles in everyday objects
* Use formal and informal mathematical language to describe and compare common angles
* Use common geometric instruments to draw two dimensional shapes
* Construct routine three dimensional objects from given nets
 |  |
| 5. Interpret routine tables, graphs and charts for work | * Identify routine tables, graphs and charts in predominately familiar texts and contexts
* Identify common types of graphs and their different uses
* Identify features of tables, graphs and charts
* Locate specific information
* Perform calculations to interpret information
* Explain how statistics can inform and persuade
* Identify misleading statistical information
* Discuss information relevant to the workplace
 | * Oral
* Written
* Practical test
* Observation
 |
| 6. Collect data and construct routine tables and graphs for work | * Identify features of common tables and graphs
* Identify uses of **different tables and graphs**
* Determine data and variables to be collected
* Determine audience
* Select a method to collect data
* Collect data
* Collate information in a table
* Determine suitable scale and axes
* Draft and draw graph to present information
* Check that data meets the expected results and context
* Report or discuss information using formal and informal mathematical language
 | * Oral
* Written
* Practical test
* Observation
 |
| 7. Use basic functions of calculator | * Identify and use keys for **basic functions on a calculator**
* Calculate using whole numbers, money and routine decimals and percentages
* Calculate with routine fractions and percentages
* Apply order of operations to solve multi-step calculations
* Interpret display and record result
* Make estimations to check reasonableness of problem solving process, outcome and its appropriateness to the context and task
* Use formal and informal mathematical language and appropriate symbolism and conventions to communicate the result of the task
 | * Oral
* Written
* Practical test
* Observation
 |

**Suggested Delivery Methods**

**•** Interview

• Role playing

• Observation

• Viewing of related videos

**Recommended Resources**

**•** Desktop computers/laptops

• Internet connection

• Projectors

• Telephone

**DIGITAL LITERACY**

**UNIT CODE: OG/CU/FO/BC/03/5/A**

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate digital literacy

**Duration of Unit:** 45 hours

**Unit Description**

This unit describes competencies required to use a computer and other digital devices for the purposes of communication, work performance and management at the workplace.

**Summary of Learning Outcomes**

1. Identify computer software and hardware
2. Apply security measures to data, hardware, software in automated environment
3. Apply computer software in solving tasks
4. Apply internet and email in communication at workplace
5. Apply desktop publishing in official assignments
6. Prepare presentation packages

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Identify computer hardware and software
 | * Concepts of ICT
* Functions of ICT
* History of computers
* Components of a computer
* Classification of computers
 | * Written tests
* Oral presentation
* Observation
 |
| 1. Apply security measures to data, hardware and software
 | * Data security and control
* Security threats and control measures
* Types of computer crimes
* Detection and protection against computer crimes
* Laws governing protection of ICT
 | * Written tests
* Oral presentation
* Observation
* Project
 |
| 1. Apply computer software in solving tasks
 | * Operating system
* Word processing
* Spread sheets
* Data base design and manipulation
* Data manipulation, storage and retrieval
 | * Oral questioning
* Observation
* Project
 |
| 1. Apply internet and email in communication at workplace
 | * Computer networks
* Network configurations
* Uses of internet
* Electronic mail (e-mail) concept
 | * Oral questioning
* Observation
* Oral presentation
* Written report
 |
| 1. Apply desktop publishing in official assignments
 | * Concept of desktop publishing
* Opening publication window
* Identifying different tools and tool bars
* Determining page layout
* Opening, saving and closing files
* Drawing various shapes using DTP
* Using colour pellets to enhance a document
* Inserting text frames
* Importing and exporting text
* Object linking and embedding
* Designing of various publications
* Printing of various publications
 | * Oral questioning
* Observation
* Oral presentation
* Written report
* Project
 |
| 1. Prepare presentation packages
 | * Types of presentation packages
* Procedure of creating slides
* Formatting slides
* Presentation of slides
* Procedure for editing objects
 | * Oral questioning
* Observation
* Oral presentation
* Written report
* Project
 |

**Suggested Delivery Methods**

* Instructor led facilitation of theory
* Demonstration by trainer
* Practical work by trainee
* Viewing of related videos
* Project
* Group discussions

**Recommended Resources**

* Desk top computers
* Laptop computers
* Other digital devices
* Printers
* Storage devices
* Internet access
* Computer software

**ENTREPRENEURIAL SKILLS**

**UNIT CODE: OG/CU/FO/BC/04/5/A**

**Relationship to occupational standards**

This unit addresses the unit of competency: Demonstrate entrepreneurial skills

**Duration of unit:** 70 hours

**Unit description**

This unit describes the competencies critical to demonstration of entrepreneurial capabilities. It involves, enhancing the entrepreneur’s business skills, fostering a culture of continuous improvement at individual and organization level, implementing appropriate internal controls for profitability, improving employed capital base and undertaking regional/county business expansion.

**Summary of Learning Outcomes**

1. Develop one’s business skill
2. Develop individual workers and teams
3. Expand markets and customers
4. Expand employed capital
5. Undertake regional/county business expansion
6. Develop business Innovative strategies
7. Develop new products/ markets

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Develop one’s business skill
 | * Entrepreneurial skills development
* Market trends
* Monitoring and anticipating market trends
* New technologies in entrepreneurship
* Products and processes in entrepreneurship
* Linkages with other entrepreneurs
* Business conventions ad exhibitions
* Personal improvement and growth
 | * Observation
* Case studies
* Individual/group assignments
* Projects
* Written
* Oral
 |
| 1. Develop individual workers and teams
 | * Good staff/workers
* Team building and team work
* Staff development and enhancement
* Culture of continuous improvement
* Increasing products and services
* Marketing improvement
* Intrapreneurship
 | * Observation
* Case studies
* Individual/group assignments
* projects
* Written
* Oral
 |
| 1. Expand markets and customers base
 | * Maintaining appropriate cash flow in the organization
* Internal controls
* Business break-even point
* Business profitability determinants
* Prudent purchases in an enterprise
* Reducing business expenses
* Good staff/workers and customer relations
* Identifying and maintain new customers and markets
* Product/ service promotions
* Products / services diversification
* SWOT / PESTEL analysis
* Conducting a business survey
* Market expansion
* Small business records management
* Book keeping and auditing for small businesses
* Business support services
* Small business resources mobilization and utilization
* Basic business social responsibility
* Management of small business
* Word processing concepts in small business management
* Computer application software
* Monitoring and controlling business operations
 | * Oral
* Observation
* Case studies
* Individual/group assignments
* projects
* Written
 |
| 1. Expand employed capital
 | * Employed capital in small businesses
* Share holdings
* Business expansion and diversification
* Resources for growing small business
* Small business Strategic Plan
* Cooperate Social responsibility
* Computer software in business development
* ICT and business growth
 | * Observation
* Case studies
* Individual/group assignments
* projects
* Written
 |
| 1. Undertake county/regional business expansion
 | * Region identification process
* Regional laws and regulation
* Business regional expansion requirements
 | * Oral
* Observation
* Case studies
* Individual/group assignments
* projects
* Written
 |

**Suggested Delivery Methods**

* Instructor led facilitation of theory
* Demonstration by trainer
* Practice by trainee
* Role play
* Case study

**Recommended Resources**

* Case studies for small businesses
* Business plan templates
* Lap top/ desk top computer
* Internet

**EMPLOYABILITY SKILLS**

**UNIT CODE:** **OG/CU/FO/BC/05/5/A**

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate employability skills

**Duration of Unit:** 50 hours

**Unit Description**

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating interpersonal communication, critical safe work habits, leading a workplace team, planning and organizing work, maintaining professional growth and development, demonstrating workplace learning, problem solving skills and managing ethical performance.

**Summary of Learning Outcomes**

1. Conduct self-management

2. Demonstrate interpersonal communication

3. Demonstrate critical safe work habits

4. Lead small teams

5. Plan and organize work

6. Maintain professional growth and development

7. Demonstrate workplace learning

8. Demonstrate problem solving skills

9. Demonstrate workplace ethics

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Conduct self-management
 | * Self-awareness
* Formulating personal vision, mission and goals
* Strategies for overcoming life challenges
* Emotional intelligence
* Assertiveness versus aggressiveness
* Expressing personal thoughts, feelings and beliefs
* Developing and maintaining high self-esteem
* Developing and maintaining positive self-image
* Articulating ideas and aspirations
* Accountability and responsibility
* Good work habits
* Self-awareness
* Self-development
* Financial literacy
* Healthy lifestyle practices
 | * Observation
* Written
* Oral interview
* Third party report
 |
| 1. Demonstrate interpersonal communication
 | * Meaning of interpersonal communication
* Listening skills
* Types of audience
* Writing skills
* Reading skills
* Meaning of empathy
* Understanding customers’ needs
* Establishing communication networks
* Sharing information
 | * Observation
* Written
* Oral interview
* Third party report
 |
| 1. Demonstrate critical safe work habits
 | * Stress and stress management
* Punctuality and time consciousness
* Leisure
* Integratingpersonal objectives into organizational objectives
* Resources utilization
* Setting work priorities
* HIV and AIDS
* Drug and substance abuse
* Handling emerging issues
 | * Observation
* Written
* Oral interview
* Third party report
 |
| 1. Lead a small team
 | * Leadership qualities
* Team building
* Determination of team roles and objectives
* Team performance indicators
* Responsibilities in a team
* Forms of communication
* Complementing team activities
* Gender and gender mainstreaming
* Human rights
* Maintaining relationships
* Conflicts and conflict resolution
 | * Observation
* Oral interview
* Written
* Third party report
 |
| 1. Plan and organize work
 | * Functions of management
* Planning
* Organizing
* Time management
* Decision making process
* Task allocation
* Evaluating work activities
* Resource utilization
* Problem solving
* Collecting and organising information
 | * Observation
* Oral interview
* Written
* Third party report
 |
| 1. Maintain professional growth and development
 | * Opportunities for professional growth
* Assessing training needs
* Licenses and certifications for professional growth and development
* Pursuing personal and organizational goals
* Identifying work priorities
* Recognizing career advancement
 | * Observation
* Oral interview
* Written
* Third party report
 |
| 1. Demonstrate workplace learning
 | * Managing own learning
* Contributing to the learning community at the workplace
* Cultural aspects of work
* Variety of learning context
* Application of learning
* Safe use of technology
* Identifying opportunities
* Generating new ideas
* Workplace innovation
* Performance improvement
* Handling emerging issues
* Future trends and concerns in learning
 | * Observation
* Oral interview
* Written
* Third party report
 |
| 1. Demonstrate problem solving skills
 | * Problem identification
* Problem solving
* Application of problem-solving strategies
* Resolving customer concerns
 | * Observation
* Oral interview
* Written
* Third party report
 |
| 1. Demonstrate workplace ethics
 | * Meaning of ethics
* Ethical perspectives
* Principles of ethics
* Values and beliefs
* Ethical standards
* Organization code of ethics
* Common ethical dilemmas
* Organization culture
* Corruption, bribery and conflict of interest
* Privacy and data protection
* Diversity, harassment and mutual respect
* Financial responsibility/accountability
* Etiquette
* Personal and professional integrity
* Commitment to jurisdictional laws
* Emerging issues in ethics
 | * Observation
* Oral interview
* Written
* Third party report
 |

**Suggested Methods of Delivery**

* Instructor lead facilitation of theory
* Demonstrations
* Simulation/Role play
* Group Discussion
* Presentations
* Projects
* Case studies
* Assignments

**Recommended Resources**

* Computers
* Stationery
* Charts
* Video clips
* Audio tapes
* Radio sets
* TV sets
* LCD projectors

# ENVIRONMENTAL LITERACY

**UNIT CODE:**  **OG/CU/FO/BC/06/5/A**

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Demonstrate environmental literacy

**Duration of Unit:** 25 hours

**Unit Description**

This unit describes the competencies required to control environmental hazard, control environmental pollution, comply with workplace sustainable resource use, evaluate current practices in relation to resource usage, identify environmental legislations/conventions for environmental concerns, implement specific environmental programs and monitor activities on environmental protection/programs.

**Summary of Learning Outcomes**

1. Control environmental hazard
2. Control environmental Pollution
3. Demonstrate sustainable resource use
4. Evaluate current practices in relation to resource usage
5. Identify Environmental legislations/conventions for environmental concerns
6. Implement specific environmental programs
7. Monitor activities on Environmental protection/Programs

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** |  **Content** | **Suggested Assessment Methods** |
| 1. Control environmental hazard
 | * Purposes and content of Environmental Management and Coordination Act 1999
* Purposes and content of Solid Waste Act
* Storage methods for environmentally hazardous materials
* Disposal methods of hazardous wastes
* Types and uses of PPE in line with environmental regulations
* Occupational Safety and Health Standards (OSHS)
 | * Written questions
* Oral questions
* Observation of work procedures
 |
| 1. Control environmental Pollution control
 | * Types of pollution
* Environmental pollution control measures
* Types of solid wastes
* Procedures for solid waste management
* Different types of noise pollution
* Methods for minimizing noise pollution
 | * Written questions
* Oral questions
* Observation of work procedures
* Role play
 |
| 1. Demonstrate sustainable resource use
 | * Types of resources
* Techniques in measuring current usage of resources
* Calculating current usage of resources
* Methods for minimizing wastage
* Waste management procedures
* Principles of 3Rs (Reduce, Reuse, Recycle)
* Methods for economizing or reducing resource consumption
 | * Written questions
* Oral questions
* Observation of work procedures
* Role play
 |
| 1. Evaluate current practices in relation to resource usage
 | * Collection of information on environmental and resource efficiency systems and procedures,
* Measurement and recording of current resource usage
* Analysis and recording of current purchasing strategies.
* Analysis of current work processes to access information and data
* Identification of areas for improvement
 | * Written questions
* Oral questions
* Observation of work procedures
* Role play
 |
| 1. Identify Environmental legislations/conventions for environmental concerns
 | * Environmental issues/concerns
* Environmental legislations /conventions and local ordinances
* Industrial standard /environmental practices
* International Environmental Protocols (Montreal, Kyoto)
* Features of an environmental strategy
 | * Written questions
* Oral questions
* Observation of work procedures
 |
| 1. Implement specific environmental programs
 | * Community needs and expectations
* Resource availability
* 5 s of good housekeeping
* Identification of programs/Activities
* Setting of individual roles /responsibilities
* Resolving problems /constraints encountered
* Consultation with stakeholders
 | * Written questions
* Oral questions
* Observation of work procedures
* Role play
 |
| 1. Monitor activities on Environmental protection/Programs
 | * Periodic monitoring and Evaluation of activities
* Gathering feedback from stakeholders
* Analysing data gathered
* Documentation of recommendations and submission
* Setting of management support systems to sustain and enhance the program
* Monitoring and reporting of environmental incidents to concerned /proper authorities
 | * Oral questions
* Written tests
* Practical test
* Observation
 |

**Suggested Delivery Methods**

* Instructor led facilitation of theory
* Demonstration by trainer
* Practical work by trainee
* Viewing of related videos

**Recommended Resources**

* Standard operating and/or other workplace procedures manuals
* Specific job procedures manuals
* Environmental Management and Coordination Act 1999
* Machine/equipment manufacturer’s specifications and instructions
* Personal Protective Equipment (PPE)
* ISO standards
* Ccompany environmental management systems (EMS)
* Montreal Protocol
* Kyoto Protocol

# OCCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE:**  **OG/CU/FO/BC/07/5/A**

**Relationship to Occupational Standards**

This unit addresses the unit of competency: Demonstrate occupational safety and health practices

**Duration of Unit:** 25 hours

**Unit Description**

This unit describes the competencies required to comply with regulatory and organizational requirements for occupational safety and health.

**Summary of Learning Outcomes**

1. Identify workplace hazards and risk
2. Identify and implement appropriate control measures to hazards and risks
3. Implement OSH programs, procedures and policies/guidelines

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Identify workplace hazards and risks
 | * Identification of hazards in the workplace and/or the indicators of their presence
* Evaluation and/or work environment measurements of OSH hazards/risk existing in the workplace is conducted by
* Authorized personnel or agency
* Gathering of OHS issues and/or concerns raised
 | * Oral questions
* Written tests
* Observation of trainees identify hazards and risks
 |
| 1. Identify and implement appropriate control measure to hazards and risks
 | * Prevention and control measures, including use of PPE (personal protective equipment) for specific hazards are identified and implemented
* Appropriate risk controls based on result of OSH hazard evaluation is recommended
* Contingency measures, including emergency procedures during workplace incidents and emergencies are recognized and established in accordance with organization procedures
 | * Oral questions
* Written tests
* Practical test
* Observation of implementation of control measures
 |
| 1. Implement OSH

 programs, procedures and policies/guidelines | * Providing information to work team about company OHS program, procedures and policies/guidelines
* Participating in implementation of OSH procedures and policies/ guidelines
* Training of team members and advice on OSH standards and procedures
* Implementation of procedures for maintaining OSH-related records
 | * Oral questions
* Written tests
* Practical test
* Observation
 |

**Suggested Delivery Methods**

* Instructor led facilitation of theory
* Demonstration by trainer
* Practical work by trainee
* Viewing of related videos

**Recommended Resources**

* Standard operating and/or other workplace procedures manuals
* Specific job procedures manuals
* Machine/equipment manufacturer’s specifications and instructions
* Personal Protective Equipment (PPE) e.g.
* Mask
* Face mask/shield
* Safety boots
* Safety harness
* Arm/Hand guard, gloves
* Eye protection (goggles, shield)
* Hearing protection (ear muffs, ear plugs)
* Hair Net/cap/bonnet
* Hard hat
* Face protection (mask, shield)
* Apron/Gown/coverall/jump suit
* Anti-static suits
* High-visibility reflective vest

**CORE UNITS OF LEARNING**

**CONDUCTING FIRE SAFETY TRAINING**

**Unit Code: OG/CU/FO/CR/01/5/A**

Relationship to Occupational Standards

This unit addresses the unit standard: Conduct Fire Safety Training

**Duration of Unit:** 160 hours

**Unit Description**

This unit describes the skills, knowledge and attitudes required by a Fire Officer in order to competently carry out fire safety training.

**Summary of Learning Outcomes**

1. Develop fire safety training plan
2. Apply housekeeping principles to training
3. Conduct fire safety training
4. Evaluate the training

**Learning Outcomes, Specific Learning Outcomes, Content and Suggested Assessment Methods**

|  |
| --- |
| **Learning Outcome 1:** Develop fire safety training plan |
| **Specific Learning****Outcomes** | **Content** | **Suggested Assessment****Methods** |
| 1.1.Identifytraining needs | Planning a training using training needs assessment reportOther sources oftraining needs information | inspection of work done |
| 1.2.Identifytrainers | Factors to considerin choosing trainers | Writtenassessment |
| 1.3.Developtraining documents | Developing schemes of workDeveloping lesson plansDeveloping notes | Inspection of work done |
| 1.4.Preparetraining aids | Types of training aids e.g.P&IDsPremises layoutsHow to prepare and set up training aids | Inspection of work doneObservation |
| 1.5.Set uptraining venue | Factors to consider in selection and setting up a training venueTraining venue set up models and their usesSafety and environmental requirements | Written assessmentObservation |

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| **Learning Outcome 2:** Apply housekeeping principles totraining venue |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 2.1 Cleanworkplace before and after training | Safety and environmental regulations for workplace cleanlinessGood housekeeping practices | Visual inspection of training venueObservation of cleaningprocess |
| 2.2 Store tools, equipment and trainingaids. | Safe storage practicesHanding over teaching aids for storage | Observation of housekeeping in storage area |
| **Learning Outcome 3:** Conduct fire safety training |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 3.1 Set training tempo | How to introduce a trainingGround rules setting and their role in group management | ObservationPractical |
| 3.2 Deliver the training | Training delivery methods for various target groupsGroup managementtechniques and their application | ObservationPractical |
| 3.3 Process all required permits | Permit to work (PTW) types and their approval processAspects of training requiring PTW | Inspection of completed permits |

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| **Learning Outcome 4:** Evaluate the training |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 2.1 Assesstraining effectiveness | Importance of training evaluationQualitative and quantitative methods of training evaluation | ObservationWritten |
| 2.2 Preparetraining report | Types of reportsHow to prepare a training report | Inspection ofcompleted report |

**Suggested Delivery Methods**

Instructor led facilitation of theory

Demonstration of task by trainer

Practice by trainee

**List of Recommended Resources**

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| --- |
| **Equipment:** |
| Fire safety equipment, tools and accessories |
| **PPE:** |
| Fire safety PPEs e.g. fireman’s suit, hood, footwear, helmet andvisor |
| **References:** |
| Andrew F. & Martin M. (2007). **Introduction to Fire Safety Management**. Elsevier Ltd (Ed.). Oxford. Butterworth Heinemann.NFPA 1452: **Guide for Training Fire Service Personnel**NFPA 600: **Standards on Facility Fire Brigades**NFPA 1401: **Recommended Practice for Fire Service** |

**MONITORING FIRE SAFETY MANAGEMENT IN THE PREMISES**

**Unit Code: OG/CU/FO/CR/02/5/A**

Relationship to Occupational Standards

This unit addresses the unit standard: Supervise fire safety in the workplace.

**Duration of Unit:** 150 hours

Unit Description

This unit describes the skills, knowledge and attitudes required by a Fire Officer in order to competently and safely supervise fire safety management in the workplace according to workplace procedures.

**Summary of Learning Outcomes**

Apply safety principles to fire safety supervision

Apply housekeeping principles to fire safety management

Monitor fire safety performance in the workplace

Report workplace fire safety performance

Learning Outcomes, Specific Learning Outcomes, Content and Suggested Assessment Methods

|  |
| --- |
| **Learning Outcome 1:** Apply safety principles to fire safetysupervision |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 1.1 Identifyreasons for monitoringsafety | Ethical and moralLegalFinancial | Written assessment |
| 1.2 Identifysocietal factors influencing safety management | EconomicGovernmentalGlobalisationWorkers demographics | Written assessment |
| 1.3 Applyprinciples of effective safety management to safety supervision | Definition of hazard, risk and dangerSafety and health management systemsRole of safety professional in safety supervisionSafety supervisor competence and the continuous professional development (CPD) programmesEthical codes of conduct for safety supervisors | Written assessmentObservation |
| 1.4 Reportincidents and accidents | Incident/accident reporting system | Inspection of accident and incident records |

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| **Learning Outcome 2:** Apply housekeeping principles to firesafety management |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 2.1 Identifyregulations affecting housekeeping | Legislative framework for workplace housekeepingWorkplace housekeeping procedures | Written assessmentObservation |
| 2.2 Inspectworkplace for good housekeeping | Good housekeepingprinciplesMethods of good housekeeping | Observation |
| **Learning Outcome 3:** Monitor fire safety performance in theworkplace |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 3.1.Demonstrate knowledge of safety performance measurement | Purpose of performance measurementSafety monitoring systemsActive systemsReactive systemsObjective and reactive systems | Written assessment |
| 3.2.Apply safety monitoring and measurement methods | Types of monitoring and measurement techniquesSafety inspectionSafety and health auditSafety tourSafety samplingSafety survey | Written assessment |

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|  | Safety rating systemsIn-house systemsInternational proprietary systems |  |
| **Learning Outcome 4:** Report workplace fire safety performance |
| **Specific****Learning Outcomes** | **Content** | **Suggested****Assessment Methods** |
| 4.1 Review fire safety andhealth performance | Safety key performance indicators (KPIs)Evaluating performance using the KPIs | Written assessmentInspection of records |
| 4.2 Preparereport of fire safety performance | Structure and content of safety performance report | Inspection of completedreport |

**Suggested Delivery Methods**

Instructor-led facilitation of theory

Demonstration of task by trainer

Practice by trainee

List of Recommended Resources

|  |
| --- |
| **Equipment:** |
| Camera and measuring instruments – noise meter, multi gastester, vibration gauge, measuring tape |
| **PPE:** |
| Workplace personal protection equipment (PPEs) – e.g. hardhats, safety shoes, coveralls, ear muffs and plugs |

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| **References:** |
| Andrew F. & Martin M. (2007). **Introduction to Fire Safety Management.** Elsevier Ltd (Ed.). Oxford. Butterworth Heinemann.Occupational safety and health regulationsPermit to work formsFire safety regulationsSafety, health and environmental manualNFPA 15: **Effective Fire Control** |

**SUPERVISING FIRE-FIGHTERS AND FIRE WARDENS IN THE WORKPLACE**

**Unit Code: OG/CU/FO/CR/03/5/A**

Relationship to Occupational Standards

This unit addresses the unit standard: Supervise Fire-fighters and Fire Wardens in the Workplace

**Duration of Unit:** 140 hours

Unit Description

This unit describes the skills, knowledge and attitudes required by a Fire Officer in order to competently and safely supervise fire- fighters and fire wardens according to instructions and workplace procedures.

Summary of Learning Outcomes

Prepare for fire-fighters and fire wardens supervision

Assign duties to fire-fighters and fire wardens

Assess performance of fire-fighters and fire wardens

Learning Outcomes, Specific Learning Outcomes, Content and Suggested Assessment Methods

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| --- |
| **Learning Outcome 1:** Prepare for supervision of fire fighters andfire wardens |
| **Specific****Learning Outcomes** | **Content** | **Suggested****Assessment Methods** |
| 1.1 Select fire fighters and fire wardens | Difference between fire- fighter and fire wardenRole of fire-fightersRole of fire wardensFactors to consider for fire- fighters and fire wardensIdentifying individual suitability for task | Written assessment |
| 1.2 Conduct fire fighters and fire wardens’ induction/ training | Developing induction/training programmes for fire-fighters and fire wardensDelivering training for fire- fighters and fire wardens | Written assessmentObservatio n |
| Identify required tools | Types of tools for fire- fightersSafe and effective use of fire- fighter toolsTypes of tools for fire wardensSafe and effective use of fire warden toolsHow to enhance individual and group capabilitiesMethods of communication between fire-fighters/fire wardens and the fire officer | WrittenObservatio n |

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| **Learning Outcome 2:** Assign duties to fire-fighters and firewardens |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 2.1 Instruct fire- fighters and fire wardens on their duties | Routine duties for fire- fighters and fire wardensEmergency duties for fire- fighters and fire wardensWorkplace layout and designdrawings interpretation for fire-fighters and wardens | Written assessmentObservation |
| 2.2 Instruct fire- fighters and fire wardens on theirsafety | Types of hazards and risks to fire-fighters and fire wardensOvercoming the hazards and risks in the course of duty | Written assessmentObservation |
| **Learning Outcome 3:** Assess performance of fire-fighters and fire wardens |
| **Specific Learning****Outcomes** | **Content** | **Suggested Assessment****Methods** |
| 3.1 Monitor fire fighter and fire warden performance | General performance management methodsMethods of fire-fighter and fire warden physical assessmentMethods of fire-fighter andfire warden technical skills assessment | Written assessmentObservation |
| 3.2 Prepareassessment report | Types of reporting performance assessmentWriting fire-fighter and fire warden physical and skills assessment reports | Inspection of records |

**Suggested Delivery Methods**

Instructor-led facilitation of theory

Demonstration of task by trainer

Practice by trainee

List of Recommended Resources

|  |
| --- |
| **Equipment:** |
| Camera and measuring instruments |
| **Materials** |
| Design and operation manuals, workplace procedures andmanuals, maintenance manuals and programmes |
| **PPEs:** |
| Workplace personal protection equipment (PPEs) |
| **References:** |
| Andrew F. & Martin M. (2007). **Introduction to Fire Safety Management**. Elsevier Ltd (Ed.). Oxford. Butterworth Heinemann.Fire-fighters/fire wardens manualOccupational Safety and Health Act, 2007Emergency response plan/procedurePermit to work formsRisk management manualSafety health and environment manualNFPA 15: **Effective Fire Control**Design and operation manualsMaintenance manuals and programmes |

**CONTAINING WORKPLACE FIRE EMERGENCIES (INCIDENTS AND ACCIDENTS)**

**Unit Code: OG/CU/FO/CR/04/5/A**

Relationship to Occupational Standards

This unit addresses the unit standard: Respond to Fire Incidents and Accidents at the Workplace

**Duration of Unit:** 120 hours

Unit Description

This unit describes the skills, knowledge and attitudes required by a Fire Officer in order to competently and safely respond to fire incidents and accidents according to instructions and workplace procedures.

Summary of Learning Outcomes

Apply workplace safety during a response

Apply housekeeping principles to the emergency site

Confirm fire emergency

Mobilise fire fighters, equipment and materials to the scene

Establish field command base

Perform evacuation and rescue operation

Effect fire suppression

Escalate response through fire emergency levels

Declare end of emergency response

Learning Outcomes, Specific Learning Outcomes, Content and Suggested Assessment Methods

|  |
| --- |
| **Learning Outcome 1:** Apply Workplace Safety |
| **Specific****Learning Outcomes** | **Content** | **Suggested****Assessment Methods** |
| 1.1 Identify correct fire-fighting personal protective equipment PPE for emergencyresponse | Types of fire-fighting PPEsPurpose of the PPEs | Observation |
| 1.2 Demonstrate correct donning and doffing of PPEs | Donning and doffing of different types of PPEsSafe and correct handling, use, maintenance and storage of different types of PPEs | Observation |
| 1.3 Carry out first responderduties | Definition of first responder in emergencyDuties of first responders | Written assessmentObservation |
| 1.4 Safely enter confined spaces during emergencyresponse | Definition and types of confined spacesTechniques and safety measures for confined spaces entry | Observation |
| 1.5 Adhere to safety requirements during the response | Safety regulations framework for emergency management Safe working procedures during emergency responseIdentifying and managing hazardous materials (HazMat) at emergency site | Written assessmentObservation |

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| --- | --- | --- |
|  | Assessing site safety as anongoing process |  |
| **Learning Outcome 2:** Apply housekeeping principles toemergency site |
| **Specific Learning****Outcomes** | **Content** | **Suggested Assessment****Methods** |
| 2.1 Cleanemergency site during and after response | Regulatory guidelines and housekeeping in emergency site managementBenefits of cleaning during and after responseMethods of emergency site cleaning and restoration | Observation |
| 2.2 Store fire- fighting tools, equipment and unused materials safely | Manufacturers’ guidelines for the care of fire-fighting tools, equipment and materialsProper storage of fire- fighting tools, equipment and materials | Observation |
| **Learning Outcome 3:** Confirm fire emergency |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 3.1 Transmit and receive routine and emergency radio messages | Understanding the International Radiotelephony Spelling Alphabet(ICAO)Using communication equipment | Written assessmentObservation |

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| --- | --- | --- |
|  |  |  |
| 3.2 Record details of emergency | Emergency information sourcesMethod of taking and confirming details in emergencyForms for recording emergency information | Written assessmentInspection of records |
| **Learning Outcome 4:** Mobilise fire fighters, equipment andmaterials to emergency scene |
| **Specific Learning****Outcomes** | **Content** | **Suggested Assessment****Methods** |
| 4.1 Raise fire alarm | Methods of communicationDifferentiating emergenciesCommon workplace emergency communication devices and how to usethem | Observation |
| 4.2 Deploy fire fire-fighters to emergency | Structure of the incident command system (ICS)Operating characteristicsOrganisation and operationFactors to consider in fire- fighters deploymentManaging fire-fighter health and wellness in emergency | Written assessmentObservation |

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| --- | --- | --- |
| 4.3 Deploy fire- fighting equipment and materials to emergency scene | Definition of a holding area in emergency siteFactors to consider in setting up holding areaSetup of a holding areaItems for holding area and the management structurePortable and motorised fire- fighting equipment for emergency response and their safe deploymentBasic design and operation of fire tenders in emergency | Written assessmentObservation |
| **Learning Outcome 5:** Establish a field command base |
| **Specific****Learning Outcomes** | **Content** | **Suggested****Assessment Methods** |
| 5.1 Set up a field command base | Role of field command post and its management structureFactors to consider in setting up a field command postSetting up control points:Reporting pointEvacuation assembly areaFirst Aid pointField command liaison with incident command centre (ICC) | Written assessmentObservation |
| 5.2 Directexternal emergency agencies | External agencies and their role in emergency sceneCoordinating external agencies at the emergency scene | Observation |

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| --- | --- | --- |
| 5.3 Provide fire ground support | What constitutes fire ground supportFire ground support operations | Observation |
| **Learning Outcome 6:** Perform evacuation and rescue operation |
| **Specific Learning****Outcomes** | **Content** | **Suggested Assessment****Methods** |
| 6.1 Applyevacuation procedures to save lives | Emergency scene evacuation proceduresPrioritisation of evacuation processSafety installations for emergency evacuation | Written assessmentObservation |
| 6.2 Applyrescue procedures | Rescue techniques in emergencyPrioritisation of rescue processRescue equipment and tools | Written assessmentObservation |
| **Learning Outcome 7:** Effect fire suppression |
| **Specific Learning****Outcomes** | **Content** | **Suggested Assessment****Methods** |
| 7.1 Safelypositionfire-fighting equipment at the scene | How to perform fire scene surveySafety considerations at the scenePlacement of fire equipment at emergency location | Observation |
| 7.2 Applymedia to extinguish fire | Classes of fireFire-fighting and materials scienceTypes of fire extinguishing media | Written assessmentObservation |

|  |  |  |
| --- | --- | --- |
|  | Techniques of applying extinguishing mediaPortable systemsMotorised systemsFixed systemsThe “do’s” and “don’ts of fire-fightingManaging fire ground hydraulics |  |
| 7.3 Performexterior fire- fighting | What constitutes exterior fire-fighting?Exterior fire-fighting operations | Written assessmentObservation |
| 7.4 Performinterior fire- fighting | What constitutes interior fire-fightingInterior fire-fighting operations | Written assessmentObservation |
| **Learning Outcome 8:** Escalate response through fire emergency levels |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 8.1 Step upemergency response from tier I through to III | Meaning of fire emergency levels (tier I, II and III)Process of escalating emergency response fromtier I to III | Written assessmentObservation |
| 8.2 Coordinate external emergency agencies on site | Types of external agenciesRole of external agencies in tier I, II and III emergenciesProcedure of command handover in each level | Written assessmentObservation |

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| **Learning Outcome 9:** Declare end of emergency response |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 9.1Inspect site for signs of successfulextinguishing | Site survey methodsHow to detect signs of fire presence | Written assessmentObservation |
| 9.2 Pronounce end of response | How to declare end of emergency responseConducting onsite post- mortem | Written assessmentObservation |

**Suggested Delivery Methods**

Instructor-led facilitation of theory

Demonstration of task by trainer

Practice by trainee

List of Recommended Resources

|  |
| --- |
| **Hand Tools:** |
| Forced entry tools e.g. door, wall, roof break-in tools |
| **Power Tools:** |
| Water pump, power saws, standby generator, skimmers |
| **Consumables:** |
| Fire-fighting materials e.g. fire-fighting foam, cold fire, drychemical powder, fire blanket |
| **Equipment:** |
| Fire-fighting equipment and accessories – portable and mobile |
| **PPE:** |
| Workplace PPEs e.g. fireman’s hood, helmet and visor, coverall,hand gloves |

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| **References:** |
| Andrew F. & Martin M. (2007). **Introduction to Fire Safety Management**. Elsevier Ltd (Ed.). Oxford. Butterworth Heinemann.Corporate fire safety manual and emergency response plan (ERP)Corporate fire safety manualIncident command system (ICS) manualFire safety regulationsNational Fire Protection Association (NFPA)standardsFireman’s handbook manual |

**CONDUCTING FIRE INCIDENTS AND ACCIDENTS INVESTIGATION**

**Unit Code: OG/CU/FO/CR/05/5/A**

Relationship to Occupational Standards

This unit addresses the unit standard: Investigate Workplace Fire Incidents and Accidents

**Duration of Unit: 1**40 hours

Unit Description

This unit describes the skills, knowledge and attitudes required by a Fire Officer in order to competently investigate workplace fire incidents and accidents.

Summary of Learning Outcomes

Apply loss causation models to incident/accident investigation

Conduct incident/accident investigation

Analyse incident/accident information

Prepare the investigation report

Learning Outcomes, Specific Learning Outcomes, Content and Suggested Assessment Methods

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| --- |
| **Learning Outcome 1:** Apply loss causation models toincident/accident investigation |
| **Specific****Learning Outcomes** | **Content** | **Suggested****Assessment Methods** |
| 1.1 Differentiate between incident andaccident | Meaning of the terms incident and accidentExamples of incidentsExamples of accidents | Written assessment |
| 1.2 Demonstrate correct use of accident causation models | Types of accident causation models and theoriesUse and limitations of the models | Written assessmentInspection of records |
| 1.3 Identifyhuman errors in incident and accident causation | Meaning of human errorTypes of human errorCauses and examples of human errorReducing human error | Written assessment |
| 1.4 Processrequired permits | Types of work permitsPermit application, renewal and handover process | Inspection of records |
| **Learning Outcome 2:** Conduct incident/accident investigation |
| **Specific****Learning Outcomes** | **Content** | **Suggested****Assessment Methods** |
| 2.1 Identifypurpose of investigation | Legislative frameworkOrganisational interests | Inspection of records |

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| --- | --- | --- |
| 2.2 Identifyinvestigation team | Factors to consider in team selectionEnsuring investigators impartiality | Inspection of recordsObservation |
| 2.3 Gatherincident/ accident information | Types of loss event and near-miss informationSources of loss event and near-miss informationTypes of loss event and near-miss reporting formsThe 5Whys and How of investigationMethods of obtaining incident/accident information | WrittenInspection of recordsObservation |
| 2.4 Identify risk control measures | Types of risk control measuresFramework for setting risk control systemsCategories of control measuresTechnical,ProceduralBehaviouralGeneral hierarchy of control measuresChoosing control measures | WrittenInspection of records |

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| **Learning Outcome 3:** Analyse incident/accident investigationinformation |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 3.1 Analyseincident and accident data | Quantitative and qualitative methods of incident/accident data analysisTechniques of information sampling during investigationMethods of determining incident/accident root causes | WrittenInspection of records |
| 3.2 Presentanalysed incident/ accidentinformation | Charts and diagrams used for incident/accident data presentation | Written assessmentInspection of records |
| **Learning Outcome 4:** Prepare the investigation report |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods** |
| 4.1 Identifyregulatory requirements for incident and accidentreporting | Legislation/regulations governing incident/accident reporting | Written assessment |
| 4.2 Writeinvestigation report | Structure and content of an incident/accident investigation report | Written assessmentInspection of report |

**Suggested Delivery Methods**

Instructor-led facilitation of theory

Demonstration of incident/accident investigation by trainer

Practice by trainee

List of Recommended Resources

|  |
| --- |
| **Equipment:** |
| Camera and measuring instruments |
| **PPEs:** |
| Workplace PPEs e.g. fireman’s hood, helmet and visor, coverall,hand gloves |
| **References:** |
| Andrew F. & Martin M. (2007). **Introduction to Fire Safety Management**. Elsevier Ltd (Ed.). Oxford. Butterworth Heinemann.Corporate incident investigation procedures 3. OSHA 2007,NFPA 921 (**Guide for Fire and Explosion Environment**)BS OHSAS 18001**Meteorology and Measurements Standards** (ISO- ICS 17)Plant/process safety manualsHR Standards - ANSI/SHRM 09001.2012: **Performance Management**MERG: **Standards for a Competence-based Approach to****Monitoring and Evaluation** |

**CONDUCTING WORKPLACE FIRE RISK ASSESSMENT**

**Unit Code: OG/CU/FO/CR/06/5/A**

Relationship to Occupational Standards

This unit addresses the unit standard: Conduct fire risk assessment in the workplace

**Duration of Unit:** 120 hours

Unit Description

This unit describes the skills, knowledge and attitudes required by a Fire Officer in order to competently perform fire risk assessment in the workplace.

Summary of Learning Outcomes

Prepare for a risk assessment process

Carry out fire risk assessment

Prepare the risk assessment report in accordance with workplace instructions

Learning Outcomes, Specific Learning Outcomes, Content and Suggested Assessment Methods

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| --- |
| **Learning Outcome 1:** Prepare for the risk assessment process |
| **Specific Learning****Outcomes** | **Content** | **Suggested assessment****methods** |
| 1.1 Set riskassessment scene | Definition of riskPurpose of assessmentScope definitionLimitations/assumptions descriptionRisk model definition | Written |
| 1.2 Performjob safety analysis (JSA) forthe risk assessment | What is a JSA?Factors to consider in selecting a job for JSAHow to perform JSADeveloping a safety plan using JSA results | ObservationInspection of completed safety plan |
| 1.3 Processrequired work permits and approvals | Types of work permitsRequirements of a permit to work (PTW) systemDesign of PTW forms | WrittenInspection of completed permits |
| 1.4 Developfire risk assessment tool | Types of risk assessment toolsSources of information for preparing risk assessment toolsPiping and instrumentation diagrams (PIDs) interpretationPremises layout and design interpretationProcess and plant design basis definition and usesFire risk assessment standards and regulations | WrittenInspection of records |

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| --- | --- | --- |
| 1.5 Identify risk assessment team | Factors to consider in deriving risk assessment teamsTeam composition and their specific roles | Demonstratio n of team representativ eness |
| 1.6 Adhere to required safety during the riskassessment process | Assessment of risks before workHow to perform risk assessment safely | Observation of adherence to safety |
| **Learning Outcome 2:** Carry out risk assessment |
| **Specific Learning Outcomes** | **Content** | **Suggested assessment methods** |
| 2.1 Pilot the risk assessment tool | What is assessment tool piloting and its importanceHow to pilot a risk assessment toolRecalibrating the risk assessment tool | Observation |
| 2.2 Identifyworkplace hazards | Definition of a hazardTypes of workplace hazardsSources of information for hazard identification, their use and limitationsMethods of identifyingworkplace hazards, their use and limitations | Written assessmentObservation |
| 2.3 Determine who could be harmed | Workplace hazards and the common risk transmission methodsHow to determine who could be harmed | Written assessment |

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| --- | --- | --- |
| 2.4 Analysethe hazards | Methods of hazard analysisDifferent approaches to hazards prioritisation | Written assessment |
| 2.5 Identifysuitable strategy to manage risks | Definition and application of:Risk avoidanceRisk reductionRisk retentionRisk transfer | Written assessment |
| 2.6 Selectappropri ate risk control measure s | Definition and types of risk controlsFramework for setting risk control systemsCategories of control measuresTechnical,ProceduralBehaviouralGeneral hierarchy of control measuresChoice of control measures | Written assessment |
| 2.7 Evaluatethe risks | Risk evaluation considerationsSocialEconomicLegal considerationsMethods of risk evaluationUsing the HSE risk assessment tool | Written assessmentDemonstration of accurate use of risk assessment tool |

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| **Learning Outcome 3: Prepare risk assessment report** |
| **Specific Learning Outcomes** | **Content** | **Suggested assessment methods** |
| 3.1Establish risk assessment legislativeframework | Legislation/regulations governing risk assessment reporting | Written assessment |
| 3.2Write a riskassessment report | Structure and contents of a risk assessment report | Inspection of completed report |

**Suggested Delivery Methods**

Instructor-led facilitation of theory

Demonstration of risk assessment by trainer

Practice by trainee

List of Recommended Resources

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| **Equipment:** |
| Camera and measuring instruments – noise meter, multi gastester, vibration gauge, measuring tape |
| **PPE:** |
| Workplace PPEs e.g. fireman’s hood, helmet and visor, coverall,hand gloves |

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| **Resources** |
| Andrew F. & Martin M. (2007). **Introduction to Fire Safety Management**. Elsevier Ltd (Ed.). Oxford. Butterworth Heinemann.Plant and process manualsPast fire risk assessment reportsNFPA 551 (**Guide for the Evaluation of Fire Risk Assessments**)API Standards (**Fire Risk Assessment and Reduction**)**Fire Safety Statute and Regulations** (OSHA 2007)Fire safety regulationsHazardous substances regulationsApproved Code of Practice (**OSH Auditing Guidelines**)Site layout plan, PPEsP&IDs |

**MAINTENANCE OF FIRE-FIGHTING EQUIPMENT AND MATERIALS MAINTENANCE**

**Unit Code: OG/CU/FO/CR/07/5/A**

Relationship to Occupational Standards

This unit addresses the unit standard: Maintain Fire-fighting Equipment and Materials

**Duration of Unit:** 110hours

Unit Description

This unit describes the skills, knowledge and attitudes required by a Fire Officer in order to competently and safely maintain fire- fighting equipment and materials according to manufacturers’ instructions and workplace procedures.

Summary of Learning Outcomes

Apply workplace safety

Apply housekeeping principles to maintenance process

Prepare tools, equipment and materials for fire equipment, accessories and materials maintenance

Maintain fire-fighting equipment, accessories and materials

Prepare maintenance report

Learning Outcomes, Specific Learning Outcomes, Content and Suggested Assessment Methods

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| **Learning Outcome 1:** Apply workplace safety |
| **Specific Learning****Outcomes** | **Content** | **Suggested Assessment****Methods** |
| 1.1 Developsafety plan for the maintenance task | Elements of a safety planConstructing a safety plan for fire equipment and materialsmaintenance | Inspection of completed safety plan |
| 1.2 Present a tool box talk on the maintenance | What is a tool box talk?Types of tool box talksTopics for tool box talkWho conducts a tool box talk?How to conduct a tool box talkBenefits of tool box talk | Written assessmentObservation |
| 1.3 Inspectequipment and tools for safety | Regulatory and organisational inspection regimes for equipment and toolsTypes of inspections and reliability certifications for equipment and toolsInterpretation of reliability certificates for equipment and tools | Written assessmentObservation |

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|  | How to conduct safety inspection of equipment and toolsReporting equipment and tools defects |  |
| 1.4 Test work area for safety | Regulatory requirements for workplace atmospheric testsTypes of testing equipment and their limitationsHow to use gas testersInterpreting gas testing results | Written assessmentObservation |
| 1.5 Identifycorrect PPEs for the tasks | Types of PPE applicable for the tasksPurpose and limitations of the PPEs | Written assessmentObservation |
| 1.6 Demonstrate correct use of PPEs | Safe and correct handling, use, maintenance and storage of the PPEs formaintenance work | Observation |
| 1.7 Work safely at heights | Regulatory guidelines on working at heightsTypes of devices and platforms for working at heightsSafety inspection and validation of working at heights devices and platforms | Written assessmentObservation |

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| 1.8 Work safely in confined spaces | Regulatory guidelines on working in confined spacesTypes of confined spaces encountered during fire equipment and tools maintenanceEmergency preparations and monitoring of work inconfined spaces | Written assessmentObservation |
| 1.9 Processrequired permits | Types of work permits applicable to maintenancesProcessing a permit to work (PTW) for maintenance work | Inspection of records |
| 1.10 Prepare for emergencies during maintenancework | Types of emergencies related to maintenance worksSetting up a workplace for emergency during maintenance | Written assessmentObservation |
| 1.11 Report incidents and accidents | Types of workplace incidents and accidents reportsIncidents and accidents reporting process | Written assessmentInspection of records |

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| **Learning Outcome 2:** Apply housekeeping principles tomaintenance process |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods:** |
| 2.1 Cleanworkplace after maintenance | Regulatory guidelines and housekeeping in maintenanceBenefits of cleaning during and after maintenanceMethods of workplace cleaning | Written assessmentObservation |
| 2.2 Store tools, equipment and unused materials safely | Manufacturers’ guidelines for the care of tools, equipment and materialsProper storage of tools, equipment andmaterials | Written assessmentObservation |
| **Learning Outcome 3:** Prepare tools, equipment, accessories andmaterials for the maintenance |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment****Methods:** |
| 3.1 Interpretspecifications for fire- fighting, tools, equipment, accessories and materials | Types of fire-fighting tools, equipment, accessories and materialsFire-fighting tools, equipment, accessories and materials specifications and their interpretation | Written assessmentObservation |

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| 3.2 Obtainmaterials and spares for the maintenance | Types of materials and spares for fire-fighting equipment, tools and materialsSafe tools, equipment and materials handling procedures | Written assessmentObservation |
| 3.3 Clean fire- fighting tools, equipment and materials | Types of cleaning materials for fire- fighting tools, equipment accessories and materialsCorrect application of the cleaning materials | Written assessmentObservation |
| **Learning Outcome 4:** Carry out maintenance of fire-fightingequipment, accessories and materials |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment****Methods:** |
| 4.1.Serviceportable fire- fighting equipment | Types of portable fire- fighting equipmentInspection and testing regime for portable fire- fighting equipmentHow to inspect, test and care for portable fire- fighting equipment | Written assessmentObservation |
| 4.2.Servicemotorised fire- fighting equipment | Types of motorised fire-fighting equipmentInspection and testing regime for motorised fire-fighting equipmentHow to inspect, test and care for motorised fire- fighting equipment | Written assessmentObservation |

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| 4.3.Service fixed fire-fighting equipment | Types of fixed fire- fighting equipmentInspection and testing regime for fixed fire- fighting equipmentHow to inspect, test and care for fixed fire- fighting equipment | Written assessmentObservation |
| 4.4.Serviceemergency communication equipment for fire-fighting service | Types of emergency communication equipmentInspection and testing regime for emergency communication equipmentHow to inspect, test and care for communication equipment | Written assessmentObservation |
| 4.5.Inspect and test fire-fighting materials | Types of fighting materialsInspection and testing regime for fire-fighting materialsHow to inspect, test and care for fire-fighting materials | Written assessmentObservation |
| 4.6.Coordinate fire safety contracts | Regulatory requirements for fire safety contractsTypes of fire safety contractsEquipmentCoordinating fire safety contracts | Written assessmentObservation |

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| **Learning Outcome 5:** Prepare maintenance report |
| **Specific Learning Outcomes** | **Content** | **Suggested Assessment Methods:** |
| 5.1.Report defects | Equipment defect reporting systemDefects reporting forms and records | Written assessment |
| 5.2. Writemaintenance report | Structure and content of reportsContents of maintenance report | Written assessment |

**Suggested Delivery Methods**

Instructor-led facilitation of theory

Practical demonstration of task by trainer

Practice by trainee

List of Recommended Resources

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| **Hand Tools:** |
| Chipping hammer | “C” clamps | Pliers (needle nose,slip joint) |
| Measuring tape | Tool boxes | Allen wrenches(metric and imperial) |
| Adjustable wrenches (various sizes) | Combination wrenches (metricand imperial) | Screwdrivers |
| Cleaning brushes | Copper Hammers | Tape measure |
|  | Vice grips | Wire brush |
| **Consumables:** |
| Foam concentrate, dry chemical powder, water, safety pins, operating levers, spray nozzles, nozzle holder, hose assembly,siphon tube assembly, hose connectors, pressure indicator gauges, cartridges, sprinkler heads, deliver hoses, |

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| **Equipment:** |
| Delivery hose repair kit, portable fire extinguisher repair kit, fire pumps repair kits, fire-fighting foam sampling kit, motorised fireequipment repair tool kit, fire alarm testing kits, fire hydrant repair tool kit, SCBA repair kit, safety harnesses |
| **PPE:** |
| Workplace personal protection equipment (PPEs) e.g. fireman’s hood, helmet and visor, coverall, hand gloves |
| **References:** |
| Andrew F. & Martin M. (2007). **Introduction to Fire Safety Management**. Elsevier Ltd (Ed.). Oxford. Butterworth Heinemann.Fire equipment service manualsNFPA 1915 **(Standards for Fire Apparatus Preventive Maintenance**)**Fire Service Manual Volume 1 – Inspection and Testing of Equipment**. HM Fire Service Inspectorate Publication Section London: TSO Issue 2 Nov 03Equipment service and operations manualsProcess safety manualsNFPA 1451 (**Standard for Fire and Emergency Vehicle Operation Training Programme**)NFPA 11C (**Standard for Mobile Foam Aspirators**)BS EN 1838: 1999(**Lighting Application - Emergency Lighting**)BS 5266 Part 1: 1999 (**Emergency Lighting**)API RB 14G **Recommended Practice for Fire Prevention****and Control** |