



## SQA Approved Centre Scottish Qualifications Authority













## DEVELOPING THE WORKFORCE OF TODAY AND THE FUTURE



In challenging times, petrochemical companies cannot afford to pour resources (time and money) into generalized development, expecting that they will end up with employees who are well equipped to perform in or lead the business.

Innovation, Return on Investment Competency-Based Development

# Developing the Petrochemical Workforce for Today and the Future

Training, developing, assuring competence to meet business and national development needs

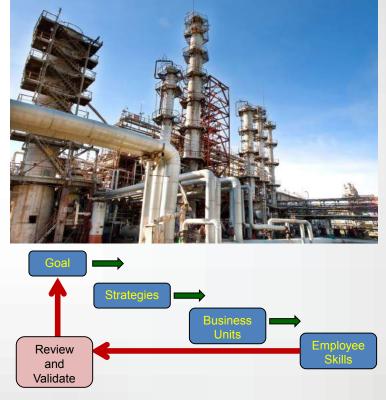
## **BUSINESS DRIVERS**

A Petrochemical company needs a sustainable workforce that can:

- Ensure product quality and quantity to meet business targets
- Avoid down-time and incidents proven competence
- Adapt to changing technology and business needs

# OLUTION

Defined and measurable workforce capability. Based on identifying the competencies (the Knowledge, Skills and Attitudes - KSA) that lead to measurable and sustainable development of individuals and teams.



## THE 4 PILLARS OF COMPETENCY



- Competency Framework: the knowledge / skills / attitude (KSA) required by a person to perform their job. Competency assessment identifies the KSA gaps that are then subject to development AND identifies the competence strengths.
- Learning and Development Solutions: to close gaps, or develop specialist skills, in a structured manner to maximize measurable Return on Investment (ROI).
- Competency Management System: software platform to manage and report on current and future (planned) workforce competence
- 4. People and Processes for success: implementation and sustainability of the workforce development solution /process

## **COMPETENCY FRAMEWORKS**

Any job is a combination of Knowledge, Skills and Attitudes / Behaviors (KSA), combined with experience, and to define the KSA enables the development of the appropriate level of competency.

A Job Competency Model (JCM) is a competency framework that is based on Competency Units (CU), each of which has a set of competency statements (descriptors) that define four levels of competence: Awareness – Knowledge – Skilled – Expert and includes technical and support competencies

#### ARO: CCR Platforming (Engineer)

Awareness	Knowledge	Skilled	Expert			
Identify the potential hazards related to the operation and maintenance of the unit. Identify the function of CCR and catalyst type Identify the specifications of the feed to reactor and outlet stream Identify the terms catalytic reforming, endothermic reaction, reaction selectivity, Catalyst regeneration, and Conversion ratio. Identify the function of the heater Identify the main parameter for controlling the catalytic reforming. Identify the heat recovery and how it is apply in the CCR system. List the poisons reactor catalysts List pre-start checks for reactor start up and shutdown Identify the reason for chloride injection	Describe the operation conditions that favor desire catalytic reforming Describe the causes which lead to catalyst poison and decreasing catalyst performance Elaborate on what causes reaction killed and how it can be controlled Describe controlling of heat required for reaction Explain actions taken in to control catalyst reactivity / catalyst degradation Explain the indications and effect of poisons on reactor catalysts, and proper action to avoid it. Describe start up and shutdown steps for reactor Explain the function of chloride base and how to control the rate and corrosion	Apply relevant EH&S policies to prevent any inherent hazards with the CCR platformer Perform a test run, technical evaluation or troubleshooting of CCR Platforming. Evaluate how catalytic reforming is achieved for converting naphtha to aromatic. Assess how CCR Platforming system can be improved. Evaluate how to maximize the yields and profits by running the platformer in the optimal mode Quantify the effect of temperature of inlet feed on the catalytic reforming Compare the actual performance of Catalyst on a regular basis Review the operating manuals or procedures, recommend improvements and explain your recommendations	Review existing processes and develop solutions for CCR PLATFORMING to increase productivity or reduce costs. Provide technical advice for benchmark studies and recommend based on benchmarking gaps. Plan and create methods to improve production processes. Ensure compliance with approved production methods and quality standards. Develop engineering standards, policies, strategies and best practices. Establish, track and continuously improve a root cause analysis program for unit problems.			
• EQ-ARO-104-A	• EQ-ARO-104-K	W-ARO-014-S     UOP-CCR001	W-ARO-014-E     UOP-CCR002			

Competency Unit (CU) example: The yellow boxes indicate the Job Level Requirement (JLR), so in this example the job requires the Skilled level.



## **UETMT COMPETENCY LIBRARIES**

UETMT maintains a series of competency libraries in which the Competency Units are grouped by discipline, including technical and non-technical CUs. In the downstream (refining / petrochemical sector) the libraries include:

#### General Engineering, including:

- Engineering technical fundamentals
- Energy Efficiency and sustainability

#### **Operations General**, including:

- Process performance and optimization
- Laboratory

#### Petrochemical / Refining, including:

- Refining
- Aromatics
- Ethylene Glycol
- Ethylene
- Polyethylene
- Polypropylene
- Styrene
- Methanol
- Ammonia
- Fertilizers

#### Support Libraries, including:

- Plant Maintenance: Rotating and Static equipment, Instrument and Electrical, Reliability and Corrosion, Electrical, Instrument & Control
- · Project Management
- Health, Safety, Environment, Security
- Human Resources (HR), Learning and Development
- Information Technology (IT), Marketing, Finance, etc.

The libraries are created and maintained by UETMT to reflect industry / discipline standards, benchmarks and certifications where appropriate.

## JOB FAMILIES / JOB POSITIONS

- The libraries are used to create the JCMs for a Job Family, e.g. Aromatics Production Engineer.
- The jobs within that Job Family are then created by selecting the Job Level Requirement for each CU, these provides a
  progression of competency requirements for the jobs within that job family.
- The job titles will vary between companies, but as an example using a notional job titles in the job family:

#### Job Family:

**Aromatics** 

#### Job Titles (JCMs):

#### **Operations:**

- Operations Technologist Aromatics
- Sr. Operations Technologist Aromatics
- Shift Leader Aromatics

#### **Engineering:**

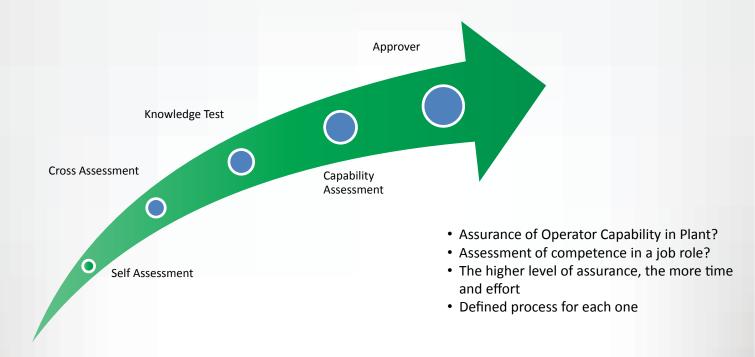
- Production Engineer Aromatics
- Sr. Production Engineer Aromatics
- Technical Authority Aromatics
- Production Leader Aromatics



Example of competency data in Comaea system: Aromatics Department

## **ASSESSMENT AND ASSURANCE**

The Competency System is designed to provide an appropriate (useful and usable) level of Assessment and Assurance



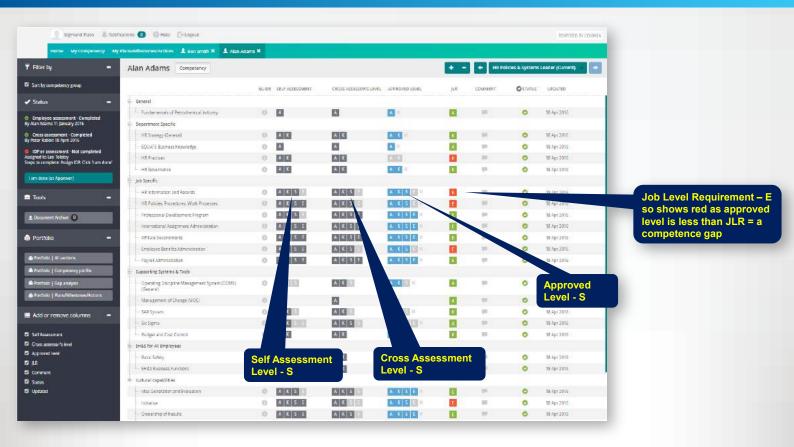
## ASSESSMENT TO DEVELOPMENT PLAN

The UETMT competency system provides an easy, effective way to manage competency assessment to Individual Development Plan (IDP). Typical process steps:

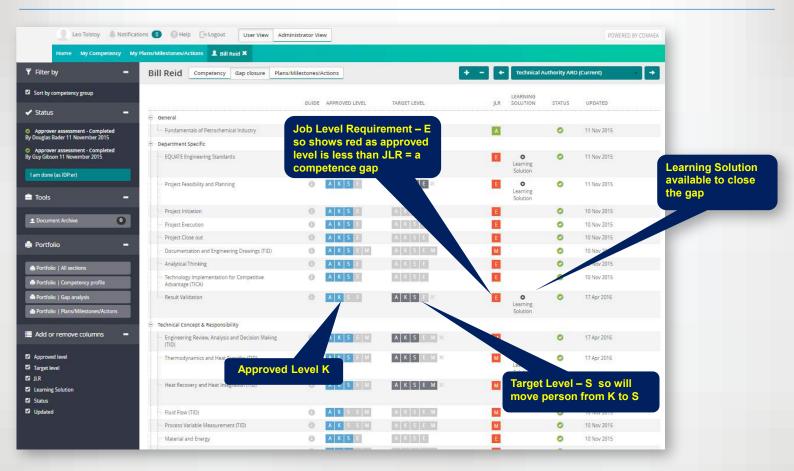
- 1. Self-assessment by an individual
- 2. Cross-assessment, typically by a supervisory level
- 3. Approved level
- 4. Based on the approved competency levels, an IDP is created using the system Learning Solutions



## **ASSESSMENT**



## **GAP ANALYSIS AND IDP**



## **LEARNING SOLUTIONS**

The UETMT competency libraries include baseline **Learning Solutions**. Learning Solution (LS) is an approved method of developing a specific competency.

- LS may be theory or application or a combination of the two
- LS enable consistent, cost-effective development of competency gaps

Learning Solutions are devised to meet the blended learning 70-20-10 methodology that recognizes the importance of structured training for theory (awareness and knowledge) and application (skilled and expert) through:

- Self-managed learning, primarily e-learning
- Instructor-led classroom courses by external vendor or internal by Company
- Work Experience / On-Job Training

## LEARNING SOLUTIONS

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Learning Solutions linked to Competency Statements. Theory for Awareness and Knowledge, practical Work Experience and advanced courses or assignments for Skilled an Expert

#### 2. EG: Ethylene Oxide Reaction System (Operations)

General Statement:			
Awareness	Knowledge	Skilled	Expert
Identify the feed specifications and ratio for reactor  Identify the terms oxidation, reaction selectivity, cycle length of the reactor, exothermic reaction, LOV and runaway reaction  List the parameters for the oxidization reactor.  Identify the type of catalyst and causes lead to permanent or temporary poison  Identify the Catalyst promoters  Ist and Identify the parameters for reduce side reactions and drive the selectivity to primary reaction not secondary reaction  Identify how to control the inlet temperature and liberated heat of the reaction.  Identify the link between glycol & reaction  Define Hot Spot, Burn-down and Feed impurities.	Describe conditions and parameter that lead to decrease byproducts formation, and drive the reaction selectivity Describe the causes which lead to catalyst degradation, permanent or temporary poison, and the proper countermeasure. Describe the function of catalyst promoters & it's function  Monitor operating reaction conditions Describe the function and location of online analyzer. Describe the proper action along with cause & effect in case of reduction in reactor selectivity. Describe the proper action along with cause & effect temporary or permanent catalyst poison Explain the causes, effects and action for hot spot, burn-down, feed impurities, change in dosing of catalyst promoters. Explain the effect of Argon ratio on the reaction and the way to control the ratio. Draw a block flow scheme of the unit and describe the functions of each component.	Maintain unit performance as per Operating Discipline OD. system.  Maintain records and reports of defects and milestones. Perform Start-up and shut-down of unit equipment Perform tasks and activities related to activated interlock system Interact with affected upstream and downstream areas/units to ensure smooth operation Troubleshoot and resolve process deviation and problems Perform tasks and activities related to alarms Action LOPA scenarios Prepare equipment for maintenance as per ECP Review/validate area operating procedures Maintain catalyst selectivity & activity as per projection	Approve area certification/ Qualification.     Review STIP and implement as appropriate.     Provide support to plant personnel in managing plant issues and problems     Analyze effect of controlling parameters on performance of the unit     Analyze unit energy index and look for opportunities to improve/control.     Analyze repeated alarms to avoid unexpected upsets.     Ensure that lessons learnt from plant upsets are shared using LER     Conduct review for process conditions compare to design conditions.     Validate and approve area operating procedures.     Participate in project Risk Assessment     Participate in reviewing final engineering Request for Technical Service "RTS" report     Participate/Conduct Critical Event Review "CER"
• EQ-EG-101-A	EQ-EG-101-K  • EQ-EG-101a-K  • EQ-EG-101b-K  • EQ-EG-101b-K	W-EG-003-S	W-EG-003-E
• EQ-EG-201-A	EQ-EG-201-K  • EQ-EG-201a-K • EQ-EG-201b-K	W-EG2-003-S	W-EG2-003-E

Learning Solution codes



## **GENERIC E-LEARNING**

Based on our experience of the Middle East petrochemical learning needs and learning styles, we have developed a range of generic e-learning on common topics. The modules are designed to deliver Basic Knowledge of the subject, and include testing elements.

The libraries available include:

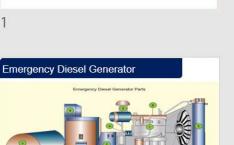
- Fundamentals of Oil & Gas Upstream, Downstream
- Maintenance: equipment and type modules
- Petrochemical and Refinery Plant Overviews
- Panel Operations
- Laboratory
- Health, Safety, Environment (HSE)
- Security
- Operator duties and processes
- English for Operators: includes modules for rig crews, plant operators (by plant type)

All our e-learning modules make extensive use of graphics and simple animation to add learning

## GENERIC E-LEARNING; CAN ALSO BE CUSTOMIZED TO CLIENT



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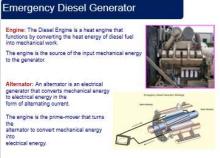
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Objectives

At the end of this module you will be able to:

Describe with block diagram the main units of EDG

- Describe the basic function of the generator
   Review the emergency power supplies
- Review the emergency power supplies
   Define the basic protection system for E
- Define the basic protection system for EDG
- Describe precautions required during routine P.M for EDG
- Describe common malfunctions for EDG
- Routine Checks for EDG
- Draw a single line diagram for EDG with low voltage switchgear.
- Describe the interface system integrated with EDG



Emergency Diesel Generator

What is a Diesel Generator?

A Diesel Generator is the combination of a diesel engine with an electric generator (often called as alternator) to generate Electrical energy.

Generator

3



Emergency Diesel Generator

Fuel System: The fuel tank usually has sufficient capacity to keep the generator operational for 6 to 8 hours.

Fuel system comprises of Pipe connection from fuel tank to engine, Ventilation pipe, Fuel Filter, Fuel injector

Voltage Regulator: AVR – Automatic Voltage regulator controls output by sensing the voltage at a powergenerating coil and comparing it to a stable reference and signal is then used to adjust the value of field current.



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## SITE-SPECIFIC E-LEARNING

### SITE SPECIFIC E-LEARNING DEVELOPMENT

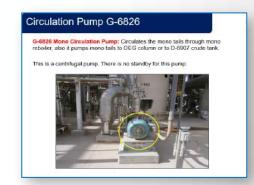
UETMT offers a cost-effective service for:

Developing site-specific e-learning for operators and technicians that is easy to use, sustainable, effective, including question banks for testing

- Learning type to suit Operators of Maintenance Technician self-led learning
- Easy to use and highly relevant to current plant equipment and process
- Sustainable easy to update when anything changes in the plant
- Can be stored and launched from Comaea or client system







## TRAINING COURSES

UETMT offers a comprehensive range of public and in-house courses / workshops in technical subjects for Petrochemicals.

We provide courses that range from industry overviews that are suited to newcomers to the industry and for those members of the workforce who are in support or office roles, to specialist technical courses for Petrochemical operators, engineers and leaders.

In-house versions of the courses can be customized to focus on your company's business sector or operating region.

### A complete list of our courses can be viewed at www.uetmt.org





## **ON-JOB TRAINING / WORK EXPERIENCE**

OJT / Work Experience developed from Competency Units:

- Defines Tasks to meet competency requirement
- Manages and records training element
- Manages and records Assessment elements
- Can be automatically managed, tracked, reported in Comaea

Certification Record	Trainee	Certification Record	Trainer
Trainee Name		Trainer Name	
Trainee ID#		Trainer IDB	
Job Title and Department		Job Title and Department	
Certification Title		li i	
Date Started			
Status	Completion Date	Approved By	Comments
E-Learning modeles	Modules are assigned in EZ-Learn and completed by trainee		
E-learning Final Test Completed			
OJT/Work Experience	For each one a separate tab must be completed and details a	inly entered here once that OJT/Wark Experis	ence is completed
Performance Test	Performance Test is based on the tabs marked Assessment; a	rach is completed as required and final result	entered here
Assessor Name			
Assessor ID		1	
Date of test		1	

EQUATE WORK EXPERIENCE				100000000000000000000000000000000000000		Saturn to Contents	
Department	EG1			Competency	Skilled		
Joh Title				Learning Code Trainer / Mentor	W-EG-003-5		
Name and ID #							
Competency Unit	Ethylene Oxide Reaction System			Total Tasks		Overall Completion %	
Competency	Job Tack Details	Priority	Assigned Task Details	Dute	Participant	Witness	Completion
Competency Statements		H-L		Date Completed			
Maintain unit performance as per Operating Discipline Ob.	Routine Readings			39	-		
	Routine round-intelatrack round			70			
	Routine Sampling			1,			
	Non-routine Sampling						
Maintain records and reports of defects and milestones.	logbook / MTL use						
	RX1-OP-61-01 EO Reaction Start Up	1					
Perform Start-up and shut-down the unit equipment (Locate, state purpose, simulate / perform procedure)	RX1-OP-61-04 EO Reaction Shutdown			7			
	RX1-OP-51-11 EO Heat removal	- 3		9		1	
Perform tasks and activities related to activated interlock system	bypeas, interlocks, over-ride elarms (Inside Op- only)				1		
interact with affected upstream and downstream areas/units to ensure amouth operation	Communication protocols, unit aspect and impact	i i					
Troubleshoot and resolve process deviation and problems	ESS-1 Recation Trip Feeds						
	ESS-2 Purge Glycol Reactor Trip						
	ESS-611 Cycle Gas Wash Pumps			1	-		

## COMPETENCY-BASED LEARNING ROADMAPS

Development of Competency-based pre-defined learning and development roadmaps. Potential uses include:

- Operator Certification e.g. a job or area in the plant
- New-hire engineer to first 'independent contributor' role
- Specialist development
- Accelerated development of nationals

#### Advantages include:

- Standardized, structured, measurable development
- Standardization of internal training and development capability
- Saves time and money

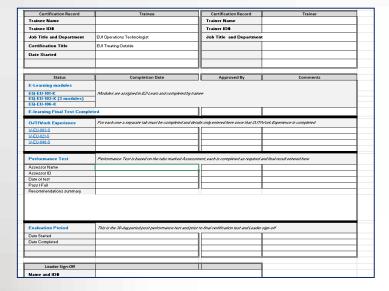
These can be assigned, implemented, managed and reported in Comaea



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## **OPERATOR CERTIFICATION**

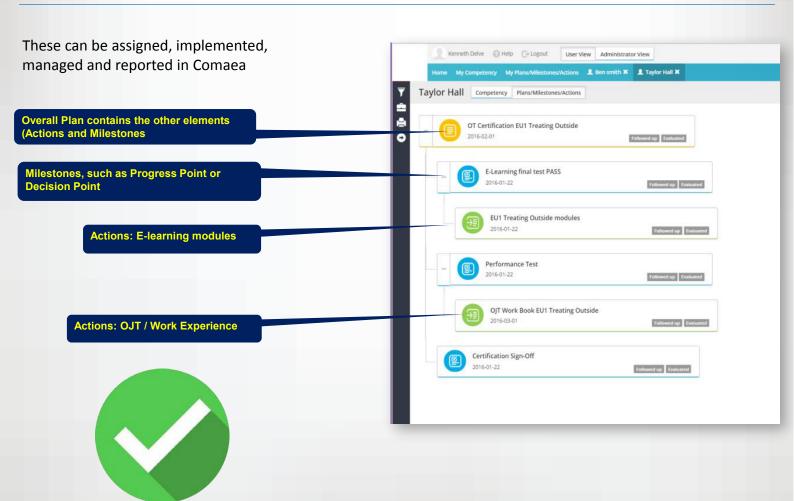
- Operator Certification example e.g. a job or area in the plant. Contains:
  - Theory learning and testing, usually e-learning
  - OJT worksheet to guide learner, trainer, SME and document progress
  - Assessment and sign-off sheets





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Name and G #				Trener / Mentos			
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## **OPERATOR CERTIFICATION: COMAEA**





## **CERTIFICATION TRACKING**

Comaea Certification / Qualification Tracker features include:

- Dashboards to show status: Valid Expiring Expired that enable pro-active management of all certifications and qualifications
- E-mail alerts to assist in managing certifications and qualifications
- Visibility by Organization, Employee, Status, Certificate



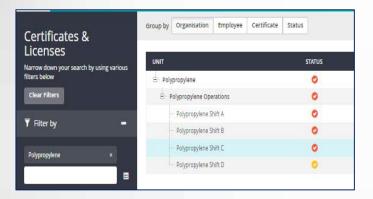
The Comaea Certificate Tracking and Reporting element of Comaea provides:

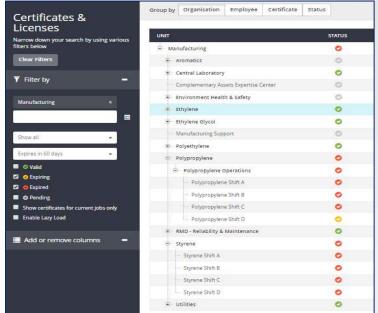
- A quick and simple way to manage certificates / qualifications. In EQUATE it is only currently applied to Operator Technologist certifications
- Notification (in Comaea and email) when a certificate requires action ('about to expire' or 'expired')

Comaea Certification / Qualification Tracker based on Organization Structure

By Organization Unit – high level e.g. Manufacturing

By Organization Unit – lower level Plant and Shift





## **UNITED EASTERN TECHNICAL & MANAGEMENT TRAINING**

## WHO ARE WE?

United Eastern Technical and Management Training (UETMT) is a fully - integrated Training and Consultancy Company, comprising a group of industry Professionals, Consultants, Executives, and Practitioners with extensive Regional (Middle East) and Global experience in Technical and Management Development, as part of Human Capital Development and Talent Acquisition, particularly in the Oil & Gas Industry, but also in other sectors.

UETMT is a subsidiary company of United Eastern Group- (UEG)- based in Abu Dhabi, UAE. The parent company has been active in the region since 1976.

UETMT is the preferred source for a comprehensive range of products and services to many long-standing clients in the Oil, Gas and Petrochemical Industries.

This not only provides you with a level of assurance, but also brings direct benefits to your business through the increase in effectiveness that a well-trained and developed workforce will bring to the workplace. The morale and motivation of your staff will increase because they will have their training internationally accredited and therefore of higher value to them.

As outlined below -'Our Services' - we work with our clients to develop, implement and sustain solutions that build national workforce capability.

#### Our capabilities include:

- Competency and Capability Assurance
- Workforce Assessment
- Training Management Services
- Training Design, Development and Delivery for the following course families:
- Technical
- Non-Technical

## **GLOBAL STANDARDS AND** ACCREDITATION

UETMT works alongside and with international bodies that provide access to global standards and certification. This ensures that our products and processes match global requirements and adds a level of assurance to our clients, whilst enabling them to adopt standards that provide real business benefit to them and their employees.

## **UETMT IS ISO CERTIFIED BY QSR**

ISO 9001: 2008- Quality Management System (QMS).

ISO 14001: 2004- Environmental Management System (EMS),

OHSAS 18001: 2007- Occupational Health & Safety Management System (OHSAS)









UETMT is an Approved Center of the Scottish Qualification Authority (SQA), a UK Governmental Organization, offering Customized Award Programs (SVQ Level) credit rated onto the Scottish Credit and Qualifications Framework (SCOF).



**UETMT** is also approved Center by a UK organization Engineering **Construction Industry Training Board (ECITB)** 



## **OUR OFFICES**

- ABU DHABI
- DUBAI
- OMAN
- KUWAIT EGYPT
- KINGDOM OF SAUDI ARABIA
- TURKEY



## **OUR MISSION**

Partner with our clients to help them develop and sustain the workforce to meet current and future business needs

## **OUR VISION**

To ensure a competent, qualified, and highly motivated workforce focused on achieving critical outcomes, through the development implementation, and sustainability of cost-effective and result-oriented Human Resource and occupational training programs, services, and practices.

## **OUR VALUES**

We believe in demonstrated competence, institutional integrity, personal commitment and deep sense of nationalism.

## OUR SERVICES

The Oil and Gas Industry's drive to International Standards of Performance, Nationalization of staff, aging workforce demographics, changing technologies, and business challenges haves caused a major shift in the training and development of the workforce, therefore our aims are to:

- Implement a seamless process that enhances the skills of Oil and Gas Employees.
- Close the Competency Gaps and develop Oil and Gas personnel to ensure they are competent to the level essential for their job positions.
- Ensure the availability of competent personnel with the necessary skill set to assure safe, efficient and reliable operations of existing and future facilities.
- Develop a culture with the belief that all accidents/incidents, environmental incidents and disruptions are preventable and that 'Zero Incident' is possible.

## **OUR CREDENTIALS**



































www.uetmt.ae

