# SAQCC FIRE

## D&GS TRAINING SUB COMMITTEE

## COURSE CURRICULUM

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| **COURSE** | **Gas Supplier Training 3<br>CO2 gas systems** | |
| **ORIGINATOR** | Keith Norgate | |
| **DATE** | 23rd September 2013 | |
| **Amendment 1** | 5th October 2013 | 1st committee review |
| **Amendments** | 21st November 2013 | 2nd draft amendments |
| **Issued** | 15th December 2013 | Issued |

| EQUIVALENT TRAINING COURSES AVAILABLE | | |
|---|---|---|
| TITLE | TRAINING SCHOOL | CONTACT DETAILS |
| CO2 gas training | Red G | 011 708 0160 |
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STATUS OF CURRICULUM - Issued

| EQUIVALENT UNIT STANDARD | |
|---|---|

None

### PURPOSE OF TRAINING COURSE

This training course is for learners to gain knowledge of $CO^2$ gas suppression systems which includes; agent properties, system components, correct installation, commissioning and maintenance

Learners who complete this course will obtain detailed knowledge of how to assess, install, commission and maintain these systems.

### LEARNING ASSUMED TO BE IN PLACE

This course assumes the learner has already proved competent in:

Fire theory
Safe workshop practice
Pipe threading and Installation of high pressure piping
Installation and commissioning of fire detection and gas release panels

## OUTCOMES REQUIRED

## Topics Covered:

1. The agent
2. Components of a $CO^2$ gas system
3. Hazards of $CO^2$ gas systems
4. System design
5. Installation of $CO^2$ gas systems
6. Completion procedures
7. Operating and maintaining gas systems

## Outcome 1. The gaseous agent $CO^2$

### Learning Outcomes:

To include:

- The agent composition
- Approved usage and limitations
- Safety factors: people, environment and equipment
- Typical applications
- Applicable approvals
- The agent extinguishing operation – mechanism of suppression
- Safe exposure levels

### Assessment:

Learner to describe the composition and approvals of the fire systems and all the extinguishing operation and safety parameters of the agent

## Outcome 2. Components of a $CO^2$ gas system

### Learning Outcomes:

To include:

- The storage vessel- high pressure and low pressure
- The agent
- The manifold and piping
- Bracketing
- Safety cap
- Valve: Over pressurisation burst disc, actuation ports, filling ports, low pressure switch connections, valve operation,

- The actuation equipment and operation; electrical, manual and pneumatic, plus actuation components (plus explosion proof)
- Multiple container actuation
- Discharge hoses
- Manifold check valve
- Discharge pressure switch
- Discharge nozzles
- Odourisers
- Warning signs
- Liquid level measuring devices
- Non return valves
- Vents for closed piping

**Assessment:**
Learner to demonstrate knowledge and use of all components

## Outcome 3. Hazard analysis of $CO^2$ gas systems.

### Learning Outcomes:

To include :
- Total flooding
- Local Application
- High pressure systems
- Low pressure systems
- Design standards and other requirements
- Hazard conditions
- Types of fires
- Hazard dimensions and additional volume factors to be considered
- Ceiling obstructions

**Assessment:**
Learner to demonstrate his knowledge of a full hazard analysis prior to installation

## Outcome 4. System design

### Learning Outcomes:

To include:
- Appropriate design standard
- Agent flow characteristics
- Pressures of the gas system - Low pressure and high pressure
- Site hazard information to be determined
- Design steps

- Design concentration and quantity of required agent
- System design examples
- Tank selection / fill density
- Nozzle design and location
- Pipe and nozzle size estimation
- Venting of closed pipe systems

**Assessment**
Learner to complete a basic gas design.

## Outcome 5. Installation of a $CO^2$ gas system

### Learning Outcomes:

To include:

- Safety basics
- Container installation
- Piping and Nozzles
- Manifold installation
- Non return valve installation
- Actuation Controls
- Ancillary Equipment
- Completion Procedures

**Assessment:**
Learner to describe how to test and commission the system and demonstrate ability to find faults on the system.

## Outcome 6. Completion procedures.

### Learning Outcomes:

To include:

- Pre checks and visual inspections
- Electrical checks, pneumatic checks
- General mechanical checks
- Final connections
- Pressure venting
- Room Integrity testing

**Assessment:**
Learner to describe the final check procedure

## Outcome 7. System operation and maintenance.

### Learning Outcomes:

To include:

- Handover instructions to end user
- Handover documentation requirements
- Service intervals and requirements

### Assessment:

Learner to describe the handover and maintenance requirements