

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
	Date revised : 26/02/2004
	Page : 1/2

## CONTENTS

<b>8.1</b>	<b>ORGANISATION</b>
<b>8.2</b>	<b>CONTINGENCY PLAN AND EMERGENCY PROCEDURES</b>
<b>8.3</b>	<b>AREA CLASSIFICATION</b>
<b>8.4</b>	<b>AUDIBLE AND VISUAL ALARMS</b>
<b>8.5</b>	<b>SHUTDOWNS</b>
<b>8.6</b>	<b>FIRE AND SMOKE DETECTION</b>
<b>8.7</b>	<b>GAS DETECTION</b>
<b>8.8</b>	<b>FIREFIGHTING FACILITIES</b>
<b>8.9</b>	<b>FIREWATER SYSTEM</b>
<b>8.10</b>	<b>HALON SYSTEMS</b>
<b>8.11</b>	<b>FIREWALLS AND FIREPROOFING</b>
<b>8.12</b>	<b>ESCAPE ROUTES</b>
<b>8.13</b>	<b>EMERGENCY LIGHTING</b>
<b>8.14</b>	<b>LIFESAVING EQUIPMENT</b>

# TOTAL FINA ELF

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.1 - ORGANISATION</b>	Date revised : 10.01.02
	Page : 1 of 2

## CONTENTS

1. **GENERAL**
2. **Refer to Platform Management Manual, PMM No. 0.9**

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.1 - ORGANISATION</b>	Date revised : 10.01.02
	Page : 2 of 2

## 1. GENERAL

The muster list gives a brief description of the emergency organization, and what to be done by individuals in case of an emergency situation, types of emergency alarms and special warning/danger, distributions to lifeboats and a sketch of lifeboats/muster stations.

It is issued by the Safety Department and can be revised only by agreement with the department.

A copy of the muster list is posted at the following locations:

Zone 04 lower level.

# TOTAL FINA ELF

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.2 - CONTINGENCY PLAN AND EMERGENCY PROCEDURES</b>	Date revised : 10.01.02
	Page : 1/1

## CONTENTS

1. Refer to “Frigg Field Contingency Plan” and “Platform Management Manual”.

# TOTAL FINA ELF

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.3 - AREA CLASSIFICATION</b>	Date revised : 10.01.02
	Page : 1/2

## CONTENTS

- 1. GENERAL**
- 2. UNCLASSIFIED AREAS**

## DIAGRAMS

<b>DIAGRAM TITLE</b>	<b>DocsOpen No.</b>	<b>Document No.</b>
Area Classification - Cellar Deck	27637	FF 95 23 03 0048 000 001
Area Classification - Lower Level	27635	FF 95 23 03 0046 000 001
Area Classification - Upper Level	27636	FF 95 23 03 0047 000 001
Area Classification - Looking West and East	27660	FF 95 23 03 0074 000 001
Area Classification - Looking North and South	27661	FF 95 23 03 0075 000 001

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.3 - AREA CLASSIFICATION</b>	Date revised : 10.01.02
	Page : 2/2

## 1. GENERAL

Platform areas have been evaluated for risk using the Institute of Petroleum Model Codes of Safe Practice Part 1: 1965, and Part 8: 1972, and the latest revision of the Institute of Petroleum Electrical Safety Code as a basis.

A dangerous area is one in which there exists or may exist a dangerous atmosphere. These areas are classified Zone 1 and Zone 2 or Unclassified as defined below.

### *Zone 1*

An area in which a dangerous atmosphere is likely to occur under normal operating conditions.

### *Zone 2*

An area in which a dangerous atmosphere is only likely to occur under abnormal operating conditions.

## 2. UNCLASSIFIED AREAS

These are not included in the dangerous category and, on TP1, are achieved as follows:

- (a) Pressurising an enclosed space with air taken from an unclassified area
- (b) Defining exterior areas which are considered to be an adequate distance from any possible gas or vapour escapes so that the gas or vapour will be dispersed before reaching this area.
- (c) Force vented areas which have a high rate of ventilation with air coming from an unclassified area. These areas are normally classified as Zone 2, if the ventilation is shut down.

**Note** The loss of forced ventilation in a room or enclosure in a Zone 2 area will result in that room or enclosure becoming a Zone 1 area.

Naturally ventilated rooms containing gas sources ventilated by means of slits in the wall, 30cm at bottom and 60cm at top of the wall, are classified as Zone 2 areas.

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.4 - AUDIBLE AND VISUAL ALARMS</b>	Date revised : 10.01.02
	Page : 1/3

**CONTENTS**

- 1. GENERAL**
- 2. DESCRIPTION**

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.4 - AUDIBLE AND VISUAL ALARMS</b>	Date revised : 10.01.02
	Page : 2/3

## 1. GENERAL

Audible and visual alarms are provided to give personnel information on the safety status of the platform.

Overall platform audible and visual alarms are broadcast by the Public Address (PA) System, refer to section 7.4.

These alarms are divided into the following categories:

- (a) Alert Signal
- (b) Muster alarm
- (c) General Platform alarm (GPA)

Local alarms are provided in certain areas for personnel evacuation and fire team orientation.

## 2. DESCRIPTION

### Overall platform audible alarms:

The audible alarms, broadcast by the Public Address System, are automatically ranked in following priorities:

- (a) Alert signal - two tone signal followed by an announcement over the P.A. System (can be abandon platform or man overboard).
- (b) Muster Alarm - continuous tone
- (c) General Platform alarm - Intermittent tone at one second intervals. This will be followed by an announcement over the P.A. system. A "GPA" is initiated by fire or gas detection.

If a "GPA" alarm is being given and a "Muster" alarm is initiated the "Muster" alarm will override.

An "alert signal" alarm is a verbal command given over the public address system from a microphone at the main control desk. This verbal command follows a 2 tone signal and will override alarm tone for a period of 10 seconds.

Operation of audible alarms is controlled manually from pushbuttons and automatically by the Fire or Gas Detection Systems. Muster and fire alarm pushbuttons are situated on the Alarm Control Panel in the Control room.

A selector switch on the Alarm Control Panel allows for alarm tone selection. "Muster" and "GPA" alarms may be cancelled by actuation of a "Cancel" pushbutton on the Alarm Control Panel.

### Local Audible Alarms

Halon protected areas have electrically operated bells installed, activated on system release.

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.4 - AUDIBLE AND VISUAL ALARMS</b>	Date revised : 10.01.02
	Page : 3/3

## 2. DESCRIPTION (conts.)

### Visual Alarms

Selected platform areas, notably noisy areas, are provided with flashing lamps operated by the Public Address System as follows:

- Yellow lamps for alarm
- Blue lamps for public address

At each entrance to a Halon protected area, a local lamp panel is installed with the following functions:

- Green lamp illuminated: system in manual
- Amber lamp illuminated: system in automatic
- Red lamp illuminated: Halon released

Red lamps are provided at room entrances to indicate Fire condition inside area, operated by Fire Detection System.

A yellow flashing light is provided at bridgelanding to TCP2. The flashing light instructs personnel not to cross the bridge. The light is activated, by a manual push button (located in QP Control room), in the event of a hazardous situation on TCP2 platform.

### Action in the Event of an Alarm

#### Alert Signal

All personnel to act as instructed over the P.A. System

#### Muster Alarm

All personnel must proceed to their designated lifeboat station and await further instructions.

#### GPA (Fire or Gas Alarm)

All personnel assigned to a fire team are to gather their designated equipment and assemble at their fire stations. All other personnel are to proceed to their allocated emergency station (refer to IC card) and await further instructions over the P.A. System.

# TOTAL FINA ELF

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.5 - SHUTDOWNS</b>	Date revised : 10.01.02
	Page : 1/2

## CONTENTS

1. **GENERAL**
2. **DESCRIPTION**

## DIAGRAMS

<b>DIAGRAM TITLE</b>	<b>DocsOpen No.</b>	<b>Document No.</b>
Shut-down Logic Diagrams (Process)	62008	FF 95 16 00 9999 000 005
Shut-down Logic Diagrams (Process)	83801	FF 95 16 00 9999 000 004
Shut-down Logic Diagram (Electrical)	83809	FF 95 16 00 9999 000 006

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.5 - SHUTDOWNS</b>	Date revised : 10.01.02
	Page : 2/2

## 1. GENERAL

The major objectives of the TP1 shutdown system are:

- (a) Prevention of injury to personnel
- (b) Prevention of damage to equipment
- (c) Operation of equipment with the minimum amount of production stoppages.

These objectives are met by Shutdown Systems which provide for shutdown of equipment of varying levels. Several levels of shutdown are provided; these are based on the degree of danger arising from a number of emergencies.

## 2. DESCRIPTION

See Shutdown Matrix for shutdown levels & effects.

### 2.1 Fusible Loops

As a fire risk reducing measure, a fusible loop has been installed around ESDV-M3.1, ESDV-M28.1, ESDV-M28.2 and ESDV-M28.6. The fusible loops are installed in the ESD pneumatic signal line for their respective valve.

In the event of a fire in the vicinity of one of the valves the pneumatic line will go down initiating a Group 'U' shutdown.

### 2.2 Overpressure Protection System

See attached O.P.P.S. information.

# TOTAL FINA ELF

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.6 - FIRE AND SMOKE DETECTION</b>	Date revised : 10.01.02
	Page : 1/2

## CONTENTS

1. **GENERAL**
2. **DESCRIPTION**

## DIAGRAMS

<b>DIAGRAM TITLE</b>	<b>DocsOpen No.</b>	<b>Document No.</b>
Fire Detector Layout - Cellar Deck Level	68841	FF 95 16 06 1389 000 105
Fire Detector Layout - Main Deck - Lower Level	68840	FF 95 16 06 1389 000 104
Fire Detector Layout - Main Deck - Upper Level	68839	FF 95 16 06 1389 000 103

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.6 - FIRE AND SMOKE DETECTION</b>	Date revised : 10.01.02
	Page : 2/2

## 1. GENERAL

A fire and smoke detection system is provided on TP1 which will detect and give early warnings of outbreaks of fire.

Detection of fire will result in the following:

- (a) An audible alarm, General Platform alarm, will sound throughout the platform.
- (b) TP1, TCP2 and QP firewater pumps will start.
- (c) Indication of the fire area at the fire control panels in the Instrument Interface Room and QP Control Room. For technical rooms, laboratory and crane indication to single sensor resolution is available in QP CCR.
- (d) Initiation of Emergency Shutdown (ESD) if the fire is in certain areas; see Shutdown Matrix.
- (e) In certain circumstances water deluge systems will be brought into operation. Refer to Section 8.9 and 8.10 for details of areas protected by these systems.

## 2. DESCRIPTION

Four types of fire sensing elements are located at various positions throughout the platform. The sensing elements each transmit an electrical signal to either a Minerva Type T870 control unit located in the Fire and Gas Detector Control Panel, FCDA ISS SCU, or the Autronica addressable fire detection panel, in the Instrument Interface Room.

The types and locations of sensors provided are:

- (a) Heat detectors - Minerva Type F80, located in the workshop areas, fire pump rooms and storage area.  
Heat detectors - Autronica type BE30, located in the crane.
- (b) Smoke detectors - Autronica Type, located in the electr.rooms, i.e. cabling and battery room, transformer Rm, switchgear room, Interface rooms, air condition room and the crane and laboratory.
- (c) Ultraviolet detectors - Det-Electronics Type C7031B, located in Zones 01, 02, 03 and 11.  
Ultraviolet detectors - Detronics Type U7602, located in Zone 09.
- (d) Infrared detectors - Detronics Type U7698, located in Zones 01, 04, 07, 09 and 10.

# TOTAL FINA ELF

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.7 - GAS DETECTION</b>	Date revised : 10.01.02
	Page : 1/3

## CONTENTS

1. **GENERAL**
2. **DESCRIPTION**

## DIAGRAMS

<b>DIAGRAM TITLE</b>	<b>DocsOpen No.</b>	<b>Document No.</b>
Gas Detection Layout - Cellar Deck Level	68848	FF 95 16 06 1390 000 013
Gas Detection Layout - Main Deck - Lower Level	68849	FF 95 16 06 1390 000 014
Gas Detection Layout - Main Deck - Upper Level	68850	FF 95 16 06 1390 000 015

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.7 - GAS DETECTION</b>	Date revised : 10.01.02
	Page : 2/3

## 1. GENERAL

A gas detection system is provided on TP1 which detects the presence of flammable gas within a set range before the concentration of the gas becomes a hazard.

Detection of gas at the lower value of the set range will result in the following:

- a) General platform alarm (GPA).
- b) Alarm in QP control room
- c) Indication at the Gas detection panels in TP1 Instrument Interface rooms.
- d) Selective inputs also alarm in MCC rooms on TP1 or TCP2.

Detection of gas at the higher value of the set range will result in the following:

- a) A general platform alarm will sound throughout the platform.
- b) TP1, TCP2 and QP firewater pumps will start. (Process area detection only).
- c) The hazard area will be indicated at the gas detection panels in TP1 Instrument Interface Rooms and QP Control Room.

## 2. DESCRIPTION

The gas detection system on TP1 utilises Sieger Type 770, 780 and 926 explosion proof sensor heads connected to Sieger Model 1402 or FSI control units. Each gas detection loop comprises one sensor and one control unit.

Each control unit contains two manually adjustable alarm set points. Each set point is individually adjustable between 0 and 100 per cent of the lower explosive limit (LEL) of gas to air mixture.

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.7 - GAS DETECTION</b>	Date revised : 10.01.02
	Page : 3/3

## 2. DESCRIPTION (conts.)

The LEL settings of the sensors are:

Area/Zone	No of Detectors	LEL Setting	
		Low	High
Zone 01 Upper Level	4	20%	60%
Zone 01 Lower Level	10	20%	60%
Zone 02 Upper Level	4	20%	60%
Zone 02 lower Level	4	20%	60%
Zone 03 Upper Level	4	20%	60%
Zone 04 Upper Level	7	20%	60%
Zone 05 Lower Level	3	20%	60%
Zone 06 Cellar Deck S	5	20%	60%
Zone 07 Cellar Deck S	3	20%	60%
Zone 08 Cellar Deck N	1	20%	60%
Zone 09 Cellar Deck N	2	20%	60%
Zone 10 Cellar Deck	4	20%	60%
Zone 10 Methanol tank V23	2	20%*	60%*
Methanol pumps P17A&B			
Zone 12 Cellar Deck N	1	20%	60%
Leg C1 Cellar Deck	3	20%	60%
Leg C2 Cellar Deck	3	20%	60%

*\*Calibrated for methanol*

On 20% LEL detected at any individual sensor a Zone alarm is initiated in QP control room.

On 60% LEL detected at any individual sensor a general alarm is initiated in QP Control room.

All potentially hazardous process locations are monitored by two independent gas detection loops.

Coincidental 60% operation of both loops is required for shutdown in order to avoid spurious shutdowns due to equipment malfunction.

In Zone 05 (electrical areas) necessary ventilation and electrical equipment shutdowns and nominated local alarms (panel in MCC room) are initiated from relevant individual detectors.

### **Gas Alarm Warning Light (Manual)**

A yellow flashing light located on TP1 Bridgehead (to TCP2) is activated by a manually operated switch (light on indication) located in QP Control Room. If a hazard arises on TCP2 platform the warning light is to prevent personnel entering the hazardous area.

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.8 - FIREFIGHTING FACILITIES</b>	Date revised : 10.01.02
	Page : 1/3

## CONTENTS

1. GENERAL
2. DESCRIPTION

## DIAGRAMS

DIAGRAM TITLE	DocsOpen No.	Document No.
Safety Plotplan & Escape Routes TP1 Lower Level	9144	FF 95 00 00 0010 000 003
Safety Plotplan & Escape Routes TP1 Cellar Deck	9143	FF 95 00 00 0010 000 002
Safety Plotplan & Escape Routes TP1 Upper Level	9145	FF 95 00 00 0010 000 004
Safety Plotplan & Escape Routes TP1 – Symbol Description	12104	FF 95 00 00 0010 000 005

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.8 - FIREFIGHTING FACILITIES</b>	Date revised : 10.01.02
	Page : 2/3

## 1. GENERAL

TP1 is provided with automatic and manually operated firefighting facilities in accordance with the requirements of:

- (a) Mineral Workings (Offshore Installations) Act 1971.
- (b) Department of Trade (Marine Division).
- (c) Det norske Veritas.

Each platform area is provided with at least one item from the following:

- (a) Automatically operated firefighting systems.
- (b) Manually operated firefighting equipment.
- (c) Fireman's outfit and rescue equipment.

Five different types of extinguishant are used on TP1 as follows:

- (a) CO<sub>2</sub>. Suitable for liquid fuel and electrical equipment fires, particularly when damage may be caused by water or powder, or where the voltage is too high for water. Once dispersed, it gives no protection against re-ignition. Since CO<sub>2</sub> displaces oxygen, there is a risk of asphyxiation if used in a confined space.
- (b) Dry Powder. Suitable for liquid fuel and electrical equipment fires. Since dry powder has no cooling properties it gives only limited protection against re-ignition.
- (c) Water Spray. Suitable for solid fuel fires.
- (d) Halon 1301 (BTM). This is a colourless, odourless, electrically non-conductive gas that extinguishes or prevents ignition by inhibiting the chemical reaction of fuel and oxygen, and is the least toxic of the vapour fire extinguishing agents. It is therefore suitable for fighting electrical fires or those involving flammable liquids. It will render a combustible mixture inert when it is present in approximately 6 per cent concentration. The discharge of Halon to extinguish a fire may create a hazard to personnel from the nature of Halon itself, and from the products of decomposition that result from exposure of Halon to the fire or other hot surfaces.
- (e) Foam. Suitable for fires involving flammable liquids. Must not be used on electrical equipment.

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.8 - FIREFIGHTING FACILITIES</b>	Date revised : 10.01.02
	Page : 3/3

## 2. DESCRIPTION

Independent Halon/FM200/CO2 systems are provided in platform areas which present a special fire hazard or which contain electrical equipment. The Halon is stored in pressurised cylinders and is released by manual intervention as a result of smoke detection in the protected area.

The facilities which are supplied with sea water by the firewater system comprises:

- (a) Water hoses.
- (b) Foam/water hoses.
- (c) Fire cannon monitors
- (d) Deluge systems
- (e) Deluge monitors (Remote operated)
- (f) Washdown water hoses

### **Portable equipment comprises:**

- (a) CO2 extinguishers - 6 kg capacity
- (b) CO2 extinguishers (trolley mounted) - 10 kg capacity
- (c) Dry powder extinguishers - 12 kg capacity
- (d) Dry powder extinguishers (trolley mounted) 50kg capacity
- (e) Dry powder extinguishers (trolley mounted) 100 kg capacity

### **Fireman's outfit and Rescue Equipment**

Fireman's outfits and rescue equipment are provided for the protection of rescue teams and to enable them to make forcible entry. This equipment is stored on QP (bridge landing to TP1), and on TCP2 Zone 5 CD.

### **Control**

The firewater system is supplied by pumps which are started automatically by operation of any fire alarm pushbutton. Automatic operation is also initiated by 2<sup>nd</sup> level Fire and Gas detection.

# TOTAL FINA ELF

TP1 OPERATIONS MANUAL	Ref. No.: DocsOpen no. 77361
VOLUME 1 - TP1 PLATFORM	Date effective : 27/01/97
SECTION 8 - SAFETY	Revision No. : 7
8.9 - FIREWATER SYSTEM	Date revised : 24.02.04
	Page : 1 of 37

## CONTENTS

1. GENERAL
2. FIRE WATER PUMPS
3. FIRE WATER RING MAIN
4. FIRE FIGHTING EQUIPMENT

## DIAGRAMS

DIAGRAM TITLE	DocsOpen No.	Document No.
System Isometric - General overview TP1 Firewater System	6930	FF 95 20 17 2418 000 001
P&ID - Firewater System	6927	FF 95 00 17 5016 000 002

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 7
<b>8.9 - FIREWATER SYSTEM</b>	Date revised : 24.02.04
	Page : 2 of 37

## 1. GENERAL

The firewater system is interconnected with the respective systems on TCP2 and QP such that firewater can be supplied from any firewater pump to any one platform. The automatic start system ensures start of all firewater pumps on all three platforms that are set for auto start.

## 2. FIREWATER PUMPS

There are two firewater pumps on TP1, P6A and P6B located in Zones 12 and 07 (Lower Level) respectively. The two firewater pumps (plus the six on TCP2 and QP) will start automatically upon:

- (i) activation of fire alarm button (FAB) in any one area;
- (ii) fire detection in any one area;
- (iii) gas detection (2<sup>nd</sup> threshold) in process area;
- (iv) activation of the deluge valve(s);
- (v) initiation of emergency shutdown (ESD)

The two firewater pumps P6 A/B are shaft driven by vertically mounted 12-cylinder Detroit diesel engines, model 12V-71T rated at 510 bhp (428 kW) at 1800 rpm. Each engine is provided with an electric (battery) start system and a pneumatic start system. The SP pumps (Sigmund Pulsometer Type FN16B15 with a stilling tube take suction from the sea at elevation -18.5m and have a nominal capacity of 7,570 litres/min (454 m<sup>3</sup>/h) at a discharge pressure of 10 bars.

The discharge pressure for all pumps is controlled by dedicated pressure control valves (PCVs) routing excess firewater overboard through separate dump lines. Facilities for yearly performance testing of the pumps are available.

Each fire pump diesel engine can be started either electrically or pneumatically:

- (a) Electrical. Two sets of nickel-cadmium batteries fitted with a sensor switch to lock out the battery should become incapable of cranking the engine. The batteries are kept charged at all times by a trickle charger.
- (b) Pneumatic. The system consist of six air start receivers which are kept pressurised by the Plant Air System.

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 7
<b>8.9 - FIREWATER SYSTEM</b>	Date revised : 24.02.04
	Page : 3 of 37

The starting cycle of each diesel engine is as follows:

- (a) On receipt of a start signal, the auto-start sequence will attempt six electric starts, automatically alternating each start between the two battery sets.
- (b) If, after the six electric start attempts, the engine is not running, an ELECTRIC AUTOSTART FAILED alarm will be initiated, and six pneumatic starts will be automatically attempted.
- (c) If the six pneumatic starts are unsuccessful, a CRITICAL FAULT alarm will be initiated and no further starts will be attempted.
- (d) The auto-start cycle may be reset, or the engine cranking initiated manually using the control panel-mounted Electric/Pneumatic Start pushbuttons.

### 3. FIREWATER RING MAIN

The 12in Firewater Ring Main encircles the Lower Deck Level and consists of several distribution nets which are interlinked such that all firewater pumps can supply any firewater consumer. The distribution ring consists of several manual isolation valves which ensures that firewater can be supplied from alternative routes should a section of the ring be out of operation. Firewater may be supplied from all eight firewater pumps on platforms TCP2, TP1 and QP.

The Firewater Ring Main are maintained in a pressurised state (5 to 7 bar) by the on/off operation of the brine pumps (P4 A/B) on QP. Should these pump fail to maintain the required pressure, then the duty firewater pump will start (low-low pressure).

The Firewater Ring Main is also connected to the Washdown Ring Main at two points via non-return valves and isolating valves. These connections allow the Washdown System to become an integral part of the Firewater System.

### 4. FIRE FIGHTING EQUIPMENT

The various firewater consumers receive firewater from the Ring Main through valves take-offs. The consumers are as follows:

- (i) Deluge systems;
- (ii) Firewater hose reels;
- (iii) Firewater monitors;
- (iv) Sprinkler systems

The deluge systems are designed to provide a general area coverage of 10 litres/(m<sup>2</sup>\*min) plus dedicated equipment coverage. The deluge systems and firewater monitors on Frøy M35 Weather Deck are provided with foam facilities. Similarly, some of the firewater hose reels throughout TCP2 are provided with foam facilities to improve the fire fighting capabilities of hydrocarbon liquid fires.

<b>TP1 OPERATIONS MANUAL</b>			Ref. No.: DocsOpen no. 77361
<b>VOLUME 1</b>	<b>- TP1 PLATFORM</b>		Date effective : 27/01/97
<b>SECTION 8</b>	<b>- SAFETY</b>		Revision No. : 7
	<b>8.9 - FIREWATER SYSTEM</b>		Date revised : 24.02.04
			Page : 4 of 37

Details of the equipment and systems served by the valved take-offs listed above are:

<b>System</b>		<b>Zone</b>	<b>Level</b>	<b>Areas/Equipment Protected</b>
XV-P6-5 A&B	Deluge system	01	Lower level	ESDV M3.1 ESDV M28.1 & ESDV M28.6
XV-P6-6	Deluge system	04	Upper level	General area - West Pig Receivers M1 and M2
XV-P6-7	Deluge Monitor "D"	04	Lower level	General area - West
XV-P6-8	Deluge Monitor "G"	12	Cellar deck	General area - North
XV-P6-10	Deluge Monitor "H"	07	Cellar deck	General area - South
XV-P6-11	Deluge Monitor "F"	03/04	Lower level	General area - East
XV-P6-12	Deluge Monitor "E"	04	Lower level	General area - West/Centre
XV-P6-14	Deluge Monitor "A" & "B"	02/03	Upper level	General area
XV-P6-18	Deluge system	09/10	Cellar deck	Glycol storage tank V9 Diesel storage tank V10 Methanol storage tank V23
XV-P6-19	Deluge Monitor "C"	01/02/03	Lower level	General area
XV-P6-21	Deluge system	01	Upper level	General area Alwyn Tie-in process piping Alwyn pig receiver M28 Cold vent K.O. drum V47
XV-P6-22	Deluge system	01	Upper level	General area Alwyn Tie-in process piping Pig receiver M3

In addition to automatic release of the deluge system upon activation of two coinciding detectors within an area; it is also possible to manually release the deluge to a dedicated deluge system. This can either be performed locally or from the QP Central Control room.

Operation of the deluge systems activates a pressure switch PSH which initiates a "Deluge released" alarm in QP Central Control Room.

Each deluge system is controlled by a pneumatically operated deluge valve which opens automatically when two or more fire detectors in the same circuit are activated. When the system downstream of the deluge valve is pressurised, the valve is held in the open position by the action of a three-way valve, venting the deluge valve diaphragm. Therefore, the deluge valve can only be closed when the firewater pumps are stopped and the system depressurised.

Provision is made in the control circuit to manually open the deluge valve. Closing of the diaphragm hand valve will vent and open the deluge valve. On loss of air pressure, a pressure switch will initiate an alarm, and activate the firewater pumps if they are not already running. Pneumatic control circuits are protected against temporary loss of air supply by volume tanks and non-return valves.

# TOTAL FINA ELF

TP1 OPERATIONS MANUAL	Ref. No.: DocsOpen no. 77361
VOLUME 1 - TP1 PLATFORM	Date effective : 27/01/97
SECTION 8 - SAFETY	Revision No. : 6
8.10 - HALON SYSTEMS/FM200 SYSTEMS/CO2 SYSTEMS	Date revised : 10.01.02
	Page : 1/3

## CONTENTS

1. GENERAL
2. DESCRIPTION
3. LOCATION OF HALON/FM200/CO2 SYSTEMS

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.10 - HALON SYSTEMS/FM200 SYSTEMS/CO2 SYSTEMS</b>	Date revised : 10.01.02
	Page : 2/3

## 1. GENERAL

Halon 1301 (BTM) is a colourless, odourless, electrically non-conductive gas that extinguishes or prevents ignition by inhibiting the chemical reaction of fuel and oxygen, and is the least toxic of the vapour extinguishing agents. It will render a combustible mixture inert when it is present in approximately 6% concentrations. Halon is normally very safe. However, when Halon is released into the atmosphere within a compartment, that compartment should be vacated as soon as possible. Under extreme conditions the Halon can break down to form an acidic compound.

## 2. DESCRIPTION

Halon/FM200 systems are located in selected platform areas to provide an firefighting system. The appropriate system may be manually operated from "break-glass" units located at the main entrance to each protected area.

Halon/FM200 is distributed within each protected area by a pipework system fitted with discharge nozzles specially designed to suit the particular application and strategically located to flood the entire area.

To provide personnel with sufficient time to evacuate an affected area prior to the discharge of the halon extinguishing system, a preset hydraulic time delay is incorporated in the release mechanism. During the time delay period an audible alarm will sound. The delay period is set when the time required for evacuation purposes has been determined, but will not exceed 30 seconds.

Visual indication is provided at the entrance to each Halon/FM200-protected area, showing the state of the system as follows:

- (a) Green lamp illuminated indicating system in manual control
- (b) Amber lamp illuminated indicating system in automatic control (no longer available)
- (c) Red lamp illuminated indicating Halon being released.

After the introduction of Early Warning Smoke Detection in the technical rooms the automatic release facility has been removed and the Halon/FM200 systems can only be released manually.

CO2 protects 2 areas, the M7 Crane and the Low Temperature Vent Stack.

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.10 - HALON SYSTEMS/FM200 SYSTEMS/CO2 SYSTEMS</b>	Date revised : 10.01.02
	Page : 3/3

### 3. LOCATION OF HALON/FM200 SYSTEMS

Completely independent Halon/FM200/CO2 Systems are provided for each area listed below, i.e. each area has its own Halon, CO2 or FM200 bottles and smoke/heat detectors.

The Halon/FM200 systems can only be released manually from the break glass pull handle units located outside the individual room doors.

The M7 crane CO2 system can be released manually either remotely from QP CCR or locally.

Room/Area	Zone	Weight of Halon (kg)	Number of Containers
Upper level		--	--
HP Relief Vent Stack (CO <sub>2</sub> )	01	--	10
M7 Crane (CO <sub>2</sub> )	05		12
Lower Level			
Motor Control Centre/ Cabling room	05	73	2
Cellar Deck			
HV Switchgear Room (FM200)	06		
Transformer Room (FM200)	06		
Air Conditioning Room/ (FM200)			
Interface Room No 1	06	111	3
Interface Room No 2	06	50	1
<u>Interface room (ceiling void)</u>	<u>06</u>	<u>45</u>	<u>1</u>

The CO2 System for the cold vent stack comprises two individual manifolded racks of five bottles each. One bottle rack is ready for immediate use, the other is a standby rack and must be opened up before use. Operation of this system may take place from either the upper or lower deck.

# TOTAL FINA ELF

TP1 OPERATIONS MANUAL	Ref. No.: DocsOpen no. 77361
VOLUME 1 - TP1 PLATFORM	Date effective : 27/01/97
SECTION 8 - SAFETY	Revision No. : 6
8.11 - FIREWALLS AND FIREPROOFING	Date revised : 10.01.02
	Page : 1/2

## CONTENTS

1. GENERAL
2. DESCRIPTION

## DIAGRAMS

See Section 8.3

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.11 - FIREWALLS AND FIREPROOFING</b>	Date revised : 10.01.02
	Page : 2/2

## 1. GENERAL

Firewalls are installed at various locations throughout the platform to limit the spread of fire. Constructed from steel plate strengthened as necessary by corrugation or stiffeners, they protect certain areas from fire or prevent a fire from spreading by containing it within an area.

## 2. DESCRIPTION

### Cellar Deck Level

Firewater pumps P6A and P6B are contained within rooms whose walls and ceilings are constructed to class A60 standard.

The internal walls of Nos 1 and 2 Interface Rooms are constructed from 5mm steel of SOLAS class AO. The ceilings of these rooms are constructed from 5mm steel coated with 35mm of marine mandolite, and the floors from 8mm carbon steel.

The internal walls of the Transformer and Air Conditioning rooms are constructed from 5mm carbon steel.

The workshop area is contained within internal walls constructed from 5mm carbon steel with rock-wool cladding and aluminium sheet. It is divided by a wall constructed from 5mm carbon steel.

### Lower Level

The internal wall of zone 05, which earlier contained the "Ruston" turbo generators, is constructed from 5mm steel of SOLAS class AO.

The north and west internal walls of the Battery Room and the west internal wall of the Cabling Room are constructed from 5mm steel and conform to A60 fire rating. The remaining internal walls of these rooms are constructed from 5mm carbon steel. The ceilings of these rooms are constructed from 5mm steel coated with 35mm of marine mandolite.

### Upper Level

The internal walls of the room which used to contain the glycol regeneration units are constructed from 5mm steel of SOLAS class AO. Sections of these walls have been removed when the glycol regeneration units were removed from the platform.

The internal walls of the Generator Control Room are constructed from 5mm carbon steel.

# TOTAL FINA ELF

TP1 OPERATIONS MANUAL	Ref. No.: DocsOpen no. 77361
VOLUME 1 - TP1 PLATFORM	Date effective : 27/01/97
SECTION 8 - SAFETY	Revision No. : 6
8.12 - ESCAPE ROUTES	Date revised : 10.01.02
	Page : 1/2

## CONTENTS

### 1. GENERAL

## DIAGRAMS

See Section 8.8

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.12 - ESCAPE ROUTES</b>	Date revised : 10.01.02
	Page : 2/2

## 1. GENERAL

Escape routes are clear routes leading from platform areas to the lifeboat and liferaft stations.

There are exit points from each module or area which lead to an escapeway.

All regularly manned areas are provided with at least two well-defined escape routes which are indicated by prominently displayed signs. To avoid confusion and/or panic, personnel should, if possible, never move along escape routes against the directional arrows.

Personnel are allotted a lifeboat station on arrival on the platform, and should familiarise themselves with its position and the escape routes leading to it.

In the event of main power failure, adequate lighting of the escape routes is provided by the emergency lighting system.

# TOTAL FINA ELF

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.13 - EMERGENCY LIGHTING</b>	Date revised : 10.01.02
	Page : 1/2

## CONTENTS

1. GENERAL
2. LIGHTING FITTINGS

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.13 - EMERGENCY LIGHTING</b>	Date revised : 10.01.02
	Page : 2/2

## 1. GENERAL

For the purposes of this Section “emergency maintained lighting” is considered lighting that has battery support and remains in operation for a limited period when all electricity generation has failed. The distribution board from which it is normally supplied is known as the Maintained Lighting board.

In particular, the lighting fed from the standby-supplies distribution board, DB8, is not considered to be emergency maintained lighting.

## 2. LIGHTING FITTINGS

Maintained lighting fittings are of the twin-tube 2 x 40W cold cathode fluorescent type. They are similar to standard fittings but have a rechargeable, tubular, 6V battery mounted on top, together with a transformer/rectifier charger, and undervoltage relay, an inverter and a transformer.

During normal operation the charger provides a trickle charge for the battery, and both tubes are fed from the 220V ac input from DB1. When this fails the undervoltage relay connects the battery to the inverter, whose output is fed to the transformer and thence an 220V to one tube only. This arrangement provides emergency lighting at half the normal level for about 45 minutes.

Upon reappearance of the normal supply the circuit returns to normal and the battery is recharged. The recharge is slow, no boost rate being provided, and can take up to 24 hours after a deep discharge.

For module 01 upper level (Alwyn Tie-in), Glamox lighting fittings are installed, supplied from DB2.

# TOTAL FINA ELF

TP1 OPERATIONS MANUAL	Ref. No.: DocsOpen no. 77361
VOLUME 1 - TP1 PLATFORM	Date effective : 27/01/97
SECTION 8 - SAFETY	Revision No. : 6
8.14 - LIFESAVING EQUIPMENT	Date revised : 10.01.02
	Page : 1/5

## CONTENTS

1. GENERAL
2. DESCRIPTION

## DIAGRAMS

See Section 8.8

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.14 - LIFESAVING EQUIPMENT</b>	Date revised : 10.01.02
	Page : 2/5

## 1. GENERAL

Lifesaving equipment providing the primary means of personnel evacuation from the platform comprises the following:

- (a) One 42-man lifeboats.
- (b) Two 25-man self-inflating liferafts.

The lifeboat system enables personnel to evacuate the platform quickly. The lifeboat is located on the north side of Zone 13 external walkway at the Cellar Deck level.

The lifeboat is totally enclosed, and protected by a water spray system which enables it to survive in an oil fire for 10 minutes. This allows the lifeboat to travel approximately one mile through burning oil when proceeding at maximum speed.

The liferafts are installed as a 'back-up' to the lifeboats. They are stowed in fibreglass containers located on the external walkway encircling the Cellar Deck as follows:

- (a) One at the north side of Zone 08.
- (b) One at the east side of Zone 12.

## 2. DESCRIPTION

### Lifeboats

The lifeboats are fibreglass lifeboats, fully equipped with survival equipment.

<b>TP1 OPERATIONS MANUAL</b>	Ref. No.: DocsOpen no. 77361
<b>VOLUME 1 - TP1 PLATFORM</b>	Date effective : 27/01/97
<b>SECTION 8 - SAFETY</b>	Revision No. : 6
<b>8.14 - LIFESAVING EQUIPMENT</b>	Date revised : 10.01.02
	Page : 3/5

## 2. DESCRIPTION (conts.)

The lifeboat is stowed in Schat Type ORD/DHM davits which allow the boat to be lowered, without power, at a controlled speed of 60 to 120 ft/min. Lowering is controlled by the helmsman by means of a control wire which passes through the boat canopy at the control position and connects to the winch brake. Lowering ceases at any position on release of the control wire.

The lifeboat is attached to the davit by two sets of falls, via Mills release gear. The release gear is operated from a handle on the port side of the steering platform, and is so designed that it will not release until the boat is waterborne.

The lifeboat is hoisted by a Schat Type BE4 which is driven by a 26kW electric motor controlled from a local panel. Limit switches are fitted to the boat mounting to stop the motor when the boat is in the stowed position and to prevent overhoisting. A crank handle is provided to rewind the falls in the event of power failure and for final boat stowage. The handle does not revolve when the hoist motor is running or when the boat is being lowered by gravity.

When the boat is in the stowed position it is secured by a gripe wire at bow and stern. The gripe wire is secured at the inboard end by a slip hook to facilitate quick release, and incorporates a turnbuckle for adjustment.

Access into the lifeboat is by two watertight doors at each side.

The lifeboat carries sufficient fuel for 24 hours' operation, and is provided with emergency equipment stowed in the steering console locker, as follows:

- (a) Pyrotechnic signals.
- (b) A battery-operated portable radio-telephone, for emergency frequency use only, which incorporates a distress alarm facility that actuates alarm systems in ships and coastguard stations.
- (c) A battery-operated flashing beacon, with line, which is stowed upside down. When inverted, the beacon automatically switches on and will operate when floating in water.
- (d) A VHF beacon buoy for air/sea rescue. Release of the flexible antenna switches on the beacon which then operates for 48 hours.
- (e) A battery-operated hand torch.
- (f) A portable radar reflector.

TP1 OPERATIONS MANUAL	Ref. No.: DocsOpen no. 77361
VOLUME 1 - TP1 PLATFORM	Date effective : 27/01/97
SECTION 8 - SAFETY	Revision No. : 6
8.14 - LIFESAVING EQUIPMENT	Date revised : 10.01.02
	Page : 4/5

## 2. DESCRIPTION (conts.)

### Liferafts

The liferafts are of the MM Mark 6 SOLAS approved type, each, in its container, being stowed in a deck stowage cradle.

Each liferaft comprises two superimposed buoyancy tubes, a double-skin floor and a canopy. The buoyancy tubes are automatically inflated by a CO2 cylinder, located in a pocket underneath the raft, which is discharged during the launch sequence. Inflation of the raft also erects the canopy. Boarding may commence approximately 30 seconds after launch.

Water pockets under the liferaft provide stability, and a drogue may be streamed to limit drift and provide directional stability.

Access to the raft is by embarkation ladders and knotted ropes, via a boarding ramp. A lifeline encircles the raft.

Each liferaft is provided with the following equipment and emergency rations:

Bailer	2
Sponge	2
Safety knife	2
Inflator (bellows type)	1
Repair kit	1
Rescue line with quoit	1
Paddles	2
Water-activated cells with lamps	2
Parachute distress signal	2*
Hand flares	6*
Signalling torch and spare batteries	1
Signalling mirror	1*
Whistle	1*
Fishing kit	1*
Concentrated food	300 oz*
Sweets	150 oz*
Potable water	37.5 litre*
Graduated drinking vessel	1*
safety tin openers	3*
Anti-seasickness tablets	150*
first aid kit	1*
Rescue signal table	1
Instruction book	1*
Record card	1

### Note:

Items marked \* are stored in the emergency pack within each liferaft. Other items are stowed in the raft.

TP1 OPERATIONS MANUAL	Ref. No.: DocsOpen no. 77361
VOLUME 1 - TP1 PLATFORM	Date effective : 27/01/97
SECTION 8 - SAFETY	Revision No. : 6
8.14 - LIFESAVING EQUIPMENT	Date revised : 10.01.02
	Page : 5/5

## 2. DESCRIPTION (conts.)

### Lifebuoys

A total of 12 lifebuoys is provided. They are located throughout the platform on external walkways.

Each lifebuoy installation is provided with a water-activated Aqualite.

When the lifebuoy is thrown overboard, the Aqualite is automatically released by its lanyard. Once in the water it will illuminate for 45 minutes.