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Crane Coverage Plan	**6934**	**FF 95 21 02 1445 000 002**
Module 01 to 05 Upper Deck Allowable Live Load	**62287**	**FF 95 00 00 3006 000 001**
Module 01 to 05 Upper Deck Allowable Live Load	**62305**	**FF 95 00 00 3007 000 001**
All units Cellar Deck Allowable Live Load	**62309**	**FF 95 00 00 3008 000 001**

1. GENERAL

One Bucyrus Erie MK 60,tag no.M8, and one Molde crane KHOD 2418/0835,tag no.M7 pedestal mounted marine cranes are provided.The crane, M7, is located on the south-west corner of Zone 04 and M8 on the north-east corner of Zone 03.

The cranes are supplied for general lifting duties within their lifting areas.

2. DESCRIPTION

The M8 crane load performance is according to DnV Dynamic Load Chart of 20.12.84 with 75% rating. The M7 crane is according to DNV rated to 100%,see the load chart next page.

The M8 crane has a boom length of 36.58 m and operates within a range of 80° above to 12° below the horizontal. The M7 crane has a boom lenght of 35m with the possibility of using a 10m extension.

Power to each crane is supplied by diesel engines, via hydraulic transmission. The M7 has a Catepillar 3408 DITA engine and the M8 crane has a General Motors 12V 71N engine.

On M8 an adjustable boom hoist limit device enables the boom to be stopped at predetermined high and low angles. Actuating pins on the boom foot trip the microswitch which controls the boom hoist hydraulic motors operation. These pins normally work from 60° to 80° above to 12° below the horizontal. An override button, located in the operators cab, allows the boom to be raised or lowered beyond the trip position.
On the M7 crane a boom limit switch system is installed.

On M8 a two block warning device operates when the hoist line hook reaches a predetermined distance from the boom hoist sheaves. Two limit switches, mounted on the boom point, are wired in parallel so that actuation of either switch will cause a warning bell to sound.
On the M7 crane a hoist limit switch system is installed.

On M8 an anti-two block shut-off device prevents the hook from being drawn into the boom hoist sheaves. Two limit switches, mounted on the boom point, are wired in parallel so that actuation of either will initiate shutdown of the hydraulic motors.
The M7 crane has only one hook winch, hence one system.

The M7 crane has "Gross overload protection" and is certified by DNV, authorized by "Certifying Authority" to certify the cranes on the Frigg field, UK sector.

Note! Operational Restrictions

TEMPORARY DERATING OF MK 60 CRANES.

The Bucyrus Erie MK 60 crane has been derated as from 04.12.91
Main hoist: 50%
Whip hoist: 25%

The Dynamic Load Chart dated 09.12.91 is to be used until the crane is upgraded again.

DIAGRAMS

Lifting Equipment

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1. DIESEL FUEL

Diesel fuel is normally supplied through 4in line D0851 from TCP2. It may also be supplied by service boat.

When bunkering from a service boat, diesel fuel is taken through 4in lines D0851 and D0852 from the east and west loading areas respectively, via flexible hoses.

Storage tank level is indicated locally at the loading areas, and at the diesel fuel control panel. Local and remote alarms sound when the tank has filled to the upper level.

2. GLYCOL

Glycol replenishment is from a service boat through 4in lines G572 and G573, from the east and west loading areas respectively, into the Glycol Storage tank V9

Storage tank level is indicated locally on the tank level indicator. A local alarm sounds when the tank has filled to the upper level.

3. METHANOL

Methanol replenishment is from either a service boat or TCP2.

Replenishment is through 3in line ME 1511 from TCP2, or through two 4in lines ME 1501 from the east and west loading areas.

Methanol is either delivered in 6m3 capacity pods which are off-loaded onto the loading areas, or by a bulk supply vessel and pumped via a 1 1/2 in hose (Q20 - methanol hose reel unit) into the storage tank V23.

High and low storage tank level alarms indicate in the control room.

4. BOAT LOADINGS

Loading from service boats should not be done under the following conditions:

a) Current greater than 1.5. knots (0.77 m/s).

b) Wind greater than 40 knots (20.57 m/s).

c) Waves higher than 5m, at a frequency greater than 8.5s.

Both landing areas are illuminated by floodlights.

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DRAWINGS

1. TECHNICAL SPECIFICATION

1.1 Mape Winches

1.1.1 Design code

F.E.M-Federation Europeenne de la Manutention

Working class	:	V 5 (50000H)
Loading Factor	:	3
Mechanics class	:	5 m
Loading Factor	:	III
Safety R	:	2
Ratio N	:	1.6
Safe working load	:	10 kN

1.1.2 Description

The winch is a fabricated steel frame structure consisting of two flanges which are connected by a steel plate box-structure.

Eeach flange is equipped with a worm reduction gear.

The double-barrel drum assembly has two hubs fitted with bronze bushings and a brake rim.

One reduction gear is equipped with an explosion-proof electrical brake motor the other with an air motor.

The brake, which has a fastening link welded on to the frame, consists of a Ferrodo-lined steel band.

Usually, the brake is applied by cup washers located in the upper section of the air actuator. The air actuator is responsible for brake release. The brake may also be released manually in the event of pneumatic system failure.

A slewing ring, fixed both to a baseplate and to the winch frame structure, allows the winch to turn through 360 degrees with steps every 15 degrees.

Two clutches manually actuated for coupling the drum on normal or emergency reduction gear. One clutch must be engaged before the other can be released.

Drum is equipped with a galvanized steel wire, steel core. The wire is fixed to the drum by means of a bolted wedge and a clamp.

Fixing of wire on cage is by a conical thimble and wire clamp.

1. TECHNICAL SPECIFICATION (conts.)

1.1.3 General

These winches are for lifting/lowering cage inside the columns of TP1 platform for visual inspection of risers, and transportation of personnel and then with guided cage.

1.1.4 Main Data

Explosion proof electric motor	: 3.5 kW at 700 rpm. 380 V 50 Hz
Nominal torque	: 38.5 Nm
Starting torque	: 54.0 Nm
Stall torque	: 69.0 Nm
* Air motor type: Globe RM 31	: 4.4 kW at 1500 rpm.
Working air pressure	: 4.9 bars
Air consumption	: 5 Nm3/mn
* Reduction gear el. motor side	:
Type SA 90	
Max Static Torque	: 2795 Nm
Gear ratio	: 64,03
* Reduction gear air motor side	
Type USOCOME SA90	
Max Static Torque	: 2688 Nm
Gear ratio	: 140,62
* El. motor fail safe type	
Braking torque	: 100 Nm
* Band brake on drum	
Braking torque	: 4120 Nm
* Drum capacity	: 2 x 150 m in 7 layer
Fabrication year	: 1979/80

1. TECHNICAL SPECIFICATION (conts.)

1.1.5 Performance Data

Normal operation

at 1st layer	: force	1000 kg
	speed	10.3 m/mn
at 7th layer	: force	1000 kg
	speed	14.4 m/mn

Emergency operation

at 1st layer	: force	1000 kg
	speed	10 m/mn
at 7th layer	: force	1000 kg
	speed	14 m/mn

1.1.6 Equalizing System

Design code

Norwegian Mining regulations (Gruveheisforskriftene)
NS 5514 - Cranes and crane machinery

EAN spec	: Material spec	FF 1021 S002
spec	: Fabrication spec	FF 1021 S003
spec	: Painting spec	FF 1021 S004/005

Safe working load: 10KN

Description

The equalizing system consists of a pair of hydraulically balanced wire sheavers.

The system will balance a difference in wire length of approx. 1000mm.

In case of failure in one wire the load will have a gentle transfer to the remaining wire, because of the inherent dampening by the oil flow between the cylinder pairs.

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DRAWINGS

Plan View Derrick Type - FF 95.21.22.2034
Elevation Derrick Type - FF 95.21.22.2035

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1. TECHNICAL SPECIFICATION

1.1 Material Handling Derrick

1.1.1 Design Code

NS 3472 "Steel Structure"
NS 5514 "Cranes and Crane machinery"
Safe working load: 5 KN

1.1.2 Description

The Derrick consists of an air operated standard Bergesen Portable Derrick 500/2500 mounted to a prefabricated foundation which is welded to module 02 at elevation 37.160 T.O.S. The Derrick is air-operated in vertical direction and hand-operated in horizontal direction.

1.1.3 General

The purpose of this derrick is lifting of goods from cellar deck (landing area outside work-shop) to main deck.
Lifting height: 30m
Work sector: 360°

1.1.4 Air Winch

Description

The air winch is a standard SAMIIA liftair 300 GC. The winch have a selfdirecting disc brake. It workst automatically when the operating handle is not in use. It is capable of stopping a 120% dynamic test load. Safe working load: 5 KN

Main Data

Working air pressure	: 4 - 6 bars
Air consumption	: 1 - 3 Nm2/mn
Drum capacity	: Ø 6,5/140m
Air entry	: 3/4 inch

Performance data

At 1st layer	: speed: 0 - 30M/mn
At full drum	: speed: 0 - 40M/mn
	: force: 5000N

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1. GENERAL

Crane Safe model 88B is manufactured by Reg-Tek prosess-Teknikk A/S in Norway.
Crane Safe is an overload-protection system, using a static data memory for storage and generation of the crane`s load moment curve.

2. DESCRIPTION

The Crane Safe System consists of the following main components:

- Pendulum potentiometer for measurement of the outreach.
- Loadcells for measurement of load in the hook.
- Electronic unit with an indicator panel.