MOZZANICA

WORLDWIDE FIRE FIGHTING SOLUTIONS

MOZZANICA & MOZZANICA S.r.L.
Fire Protection Engineering
OIL & GAS – MARINE CONSULTANTS
Headquarter : 23885 Calco (LC) Loc. Scagnello, 13/A – Italy
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MAINTENANCE TEST REPORT

Maintenance Test Report No.	**RT15-LI-001A**
Customer: CARNIVAL CRUISE LINES	**Vessel: CARNIVAL LIBERTY**
Location : CARNIVAL LIBERTY	**Date: Sept 12th 2015**
Type of System : HP CO_2 SYSTEM	**Manufacturer: FINCANTIERI**

TYPE OF INSPECTION

	~~SIX MONTHS~~		**EXTRAORDINARY**	■	~~2 YEARS~~		~~5 YEARS~~		~~10 YEARS~~		

	CYLINDER DATA	MACHINERY SPACES	GALLEYS	PAINT STORE	PEM	ADG	TENDER ENGINES	BATTERY ROOM
CO_2 cylinders	N° of cylinders	89 x 60 l	N.A	N.A	N.A	N.A	N.A	N.A
	Cylinder size (Kg)	60 l – 40 kg	N.A	N.A	N.A	N.A	N.A	N.A
	Last cylinder pressure test date	2015 See PO14-MA-0C3A Weighing Procedure	N.A	N.A	N.A	N.A	N.A	N.A
	Flexible hoses replacement date	2021	N.A	N.A	N.A	N.A	N.A	N.A
Pilot cylinders	N° of cylinders	4	N.A	N.A	N.A	N.A	N.A	N.A
	Cylinder size (Kg)	No.7 l X85 BAR No.27 l X 60 BAR	N.A	N.A	N.A	N.A	N.A	N.A
	Fluid	NITROGEN	N.A	N.A	N.A	N.A	N.A	N.A
	Last cylinder pressure test date	2011 2013	N.A	N.A	N.A	N.A	N.A	N.A
System actuation	Electrical / Pneumatic	MANUAL PNEUMATIC	N.A	N.A	N.A	N.A	N.A	N.A
CLASS / FLAGS	LLOYD / PANAMA							
ZONES	MACHINERY SPACES CO2 SYSTEM RESET AND RECOMMISSIOING AFTER A FIRE ON DG4							

DATA TEST RECORD REPORTS	Reports enclosed YES	NO
MNMS rev. 0 del 03.06.2014 - Machinery Spaces CO_2 - Test Record Data	OK	-
MNGY rev. 0 del 03.06.2014 - Galleys CO_2 - Test Record Data	-	-
MNPM rev. 0 del 03.06.2014 - Propulsion Motors - CO_2 Test Record Data	-	-
MNPS rev. 0 del 03.06.2014 - Paint Store - CO_2 Test Record Data	-	-
MNAD rev. 0 del 27.08.2014 - ADG - CO_2 Test Record Data	-	-
MNTE rev. 0 del 29.08.2014 - TENDER ENGINES - CO_2 Test Record Data	-	-
MNBR rev. 0 del 29.08.2014 - BATTERY ROOM - CO_2 Test Record Data	-	-
MNWR rev.0 del 03.06.2014 - Weighing Report - CO_2 Cylinders	OK	-

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MAINTENANCE REPORT

Type of check	*Done (D) Not Done (ND)*	*Maintenance Test Standards*	*Documents*	*Results*
Visual & Dimensional		FSS CODE Ed. 2007 /2012/2014 Chapter 5 SOLAS Ed.2009 /11/12/13 Chapter II-2 IMO IMO MSC Circ. 1432 IMO MSC Circ. 1318 Applicable MSC/Circulars Lloyd Register CODE Part. 5 BAHAMAS / PANAMA / MALTA FLAGS Panama Circ. MMC-281 Carnival Corporation HESS 026	MANUFACTURER / CUSTOMER / PMSS CO2 TEST PROTOCOL CO2 TEST RECORD DATA PO14-MA-002-A REV.0 PO14-MA-002-B REV.0 PO14-MA-002-C REV.0 PO14-MA-002-D REV.0 PO14-MA-002-E REV.0 PO14-MA-002-F REV.0 PO14-MA-002-G REV.0 MANUFACTURER REFERENCE DWG D.500.5730.251.001 REV.G – 1/1 CO2 SYSTEM OPERATION SCHEME. D.500.5730.251.002 REV.J SH-1-8 CO2 SYSTEM PIPING DIAGRAM D.500.5730.251.003 REV.J SH-1/12 CO2 SYSTEM GALLEY EXAUST DUCTS	
1) Release control and distribution valves secured	D			Satisfactory
2) CO_2 Cylinder Room spaces;	D			Satisfactory
3) Main, Distribution and Cylinders Valves check	D			Satisfactory
4) Cylinders clamp and connections tightness	D			Satisfactory
5) Manifold check	D			Satisfactory
6) CO_2 main Release Station;	D			Satisfactory
7) CO_2 Remote Release Station;	D			Satisfactory
8) CO_2 Distribution piping (Machinery spaces);	ND			ND
9) CO2 Galley Control station;	ND			ND
10) CO_2 Room – CO_2 Galley discharge /distribution manifold / piping ;	ND			ND
11) CO_2 PEM discharge /distribution manifold / piping ;	ND			ND
12) CO_2 ADG discharge /distribution manifold / piping ;	ND			ND
13) CO_2 TENDER ENGINES discharge /distribution manifold / piping ;	ND			ND
14) CO_2 BATTERY ROOM discharge /distribution manifold / piping ;	ND			ND
15) CO_2 Control panels electrical connections	D			Satisfactory
16) CO_2 Room Cylinder weighing	D			*Satisfactory* See CO_2 CYLINDER WEIGHT No. PO14-MA-003A Rev.1
17) CO_2 Galley Cylinders weighing	ND			ND
18) CO_2 Paint Store Cylinders weighing	ND			ND
19) CO_2 PEM Cylinders weighing	ND			ND

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20) CO_2 ADG Cylinders weighing	ND			ND
21) CO_2 TENDER ENGINES Cylinders weighing	ND			ND
22) CO_2 BATTERY ROOM Cylinders weighing	ND			ND
23) CO_2 Pilot cylinders filling charge (CO_2 Room)	N.A.			N.A.
24) CO_2 Pilot cylinders filling charge (ECR)	N.A.			N.A.
25) Nitrogen Pressure of Pilot Cylinder – CO2 ROOM	D			**55 bar**
26) Nitrogen Pressure of Pilot Cylinder – CO2 ROOM	D			**55 bar**
27) Nitrogen Pressure of Pilot Cylinder – ECR	D			**85 bar**
28) Nitrogen Pressure of Pilot Cylinder - ECR	D			**85 bar**
29) CO_2 Instruction and warning plates	D			*Satisfactory*

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Type of check	Done (D) Not Done (N)	Maintenance Test Standards	Documents	Results
Pressure test		FSS CODE Ed. 2007 /2012/2014 Chapter 5 SOLAS Ed.2009 /11/12/13 Chapter II-2 IMO IMO MSC Circ. 1432 IMO MSC Circ. 1318 Applicable MSC/Circulars Lloyd Register CODE Part. 5 BAHAMAS / PANAMA / MALTA FLAGS Panama Circ. MMC-281 Carnival Corporation HESS 026	MANUFACTURER / CUSTOMER / PMSS CO2 TEST PROTOCOL CO2 TEST RECORD DATA PO14-MA-002-A REV.0 PO14-MA-002-B REV.0 PO14-MA-002-C REV.0 PO14-MA-002-D REV.0 PO14-MA-002-F REV.0 PO14-MA-002-G REV.0	*Functional tests have been carried out with NITROGEN ONLY*
a) CO_2 Room pneumatic manifold and control lines;	D			See CO_2 TEST RECORD DATA PO14-MA-002-A REV.0
b) CO_2 Remote pneumatic manifold and control lines;	D			See CO_2 TEST RECORD DATA PO14-MA-002-A REV.0
c) CO_2 Room - DN100 CO_2 Discharge manifold ;	D			See CO_2 TEST RECORD DATA PO14-MA-002-A REV.0
e) CO_2 Galley discharge / distribution piping ;	ND			ND
f) CO_2 Paint Store discharge / distribution piping ;	N.A.			N.A.
g) CO_2 PEM discharge / distribution piping ;	ND			ND
h) CO_2 ADG discharge / distribution piping ;	N.A.			N.A.
i) CO_2 TENDER ENGINES disch. / distribution piping ;	ND			ND
j) CO_2 BATTERY ROOM discharge / distribution piping ;	N.A.			N.A.
Flushing test			MANUFACTURER / CUSTOMER / PMSS CO2 TEST PROTOCOL CO2 TEST RECORD DATA PO14-MA-002-A REV.0 PO14-MA-002-B REV.0 PO14-MA-002-C REV.0 PO14-MA-002-D REV.0 PO14-MA-002-F REV.0 PO14-MA-002-G REV.0	*Functional tests have been carried out with NITROGEN OR DRY AIR*
a) CO_2 Room pneumatic manifold and control lines;	D			See CO_2 TEST RECORD DATA PO14-MA-002-A REV.0
b) CO_2 Rem.Station pneumatic manifold and ctrl. lines;	D			See CO_2 TEST RECORD DATA PO14-MA-002-A REV.0
c) CO_2 Room - CO_2 Discharge / distribution manifold ;	D			See CO_2 TEST RECORD DATA PO14-MA-002-A REV.0
d) CO_2 Discharge / distribution piping (Machinery Spaces)	ND			ND
e) CO_2 Galley discharge / distribution manifold / piping ;	ND			ND
f) CO_2 Paint Store discharge / distribution piping ;	N.A.			N.A.
g) CO_2 PEM discharge / distribution piping ;	ND			ND
h) CO_2 ADG discharge / distribution piping ;	N.A.			N.A.
i) CO_2 TENDER ENGINES disch. / distribution piping ;	ND			ND
j) CO_2 BATTERY ROOM disch. / distribution piping ;	N.A.			N.A.

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Type of check	Done (D) Not Done (ND)	Maintenance Test Standards	Documents	Results
▪ Functional test		FSS CODE Ed. 2007 /2012/2014 Chapter 5 SOLAS Ed.2009 /11/12/13 Chapter II-2 IMO IMO MSC Circ. 1432 IMO MSC Circ. 1318 Applicable MSC/Circulars Lloyd Register CODE Part. 5 BAHAMAS / PANAMA / MALTA FLAGS Panama Circ. MMC-281 Carnival Corporation HESS 026	MANUFACTURER / CUSTOMER / PMSS CO2 TEST PROTOCOL CO2 TEST RECORD DATA PO14-MA-002-A REV.0 PO14-MA-002-B REV.0 PO14-MA-002-C REV.0 PO14-MA-002-D REV.0 PO14-MA-002-F REV.0 PO14-MA-002-G REV.0 See UNI Proc. EU 26789-94	***Functional tests have been carried out with NYTROGEN ONLY.***
a) CO_2 Room System activation sequences;	D			**Satisfactory** See CO_2 TEST RECORD DATA PO14-MA-002-A REV.0
b) CO_2 Remote Station System activation sequences;	D			**Satisfactory** See CO_2 TEST RECORD DATA PO14-MA-002-A REV.0
c) CO_2 Galleys - activation sequences;	ND			ND
d) CO_2 PEM - activation sequences;	ND			ND
e) CO_2 Paint Store activation sequences;	N.A.			N.A.
f) CO_2 ADG activation sequences;	N.A.			N.A.
g) CO_2 TENDER ENGINES activ. sequences;	ND			ND
h) CO_2 BATTERY ROOM activ. sequences;	N.A.			N.A.
i) Control Panels (Master/Slave) CO_2 Alarms check;	D			**Satisfactory** See CO_2 TEST RECORD DATA PO14-MA-002-A REV.0
j) Discharge / Pneumatic hoses check with *Dinamometric Wrench;*	D			**Satisfactory** See UNI Proc. EU 26789-94
k) Discharge / Pneumatic hoses bending radius check;	D			**Satisfactory** See UNI Proc. EU 26789-94

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Activities performed on ***HP CO_2 SYSTEM*** *on board of* ***Carnival LIBERTY :***

Activities have been carried out at presence of the following companies :

1) ***MOZZANICA MARINE SERVICE : Technicias*** [redacted]
2) ***CARNIVAL CRUISE LINES : Chief Engineer*** [redacted]
Safety Officer [redacted]

After CO_2 system discharge inside ENGINE DG4, due to a fire occurred inside this area, the following activities necessary to reset the CO_2 SYSTEM have been performed :

a) *Complete CO_2 SYSTEM (MACHINERY SPACES) visual and dimensional check ;*

b) *DIRECTIONAL VALVES inspection and preliminary manual tests ;*

c) *DIRECTIONAL VALVE PNEUMATIC CONTROL LINES (ZONES A-B-C) PRESSURE TEST at 50 Bar for 10 minutes with satisfactory result. See attached pressure test report VP15-LI-102A ;*

d) *PNEUMATIC CONTROL LINES PRESSURE TEST, UPSTREAM MANUAL CONTROL BOXES, at 50 Bar for 10 minutes with satisfactory results. Some leakages discovered during pneumatic activation have been fixed.*

e) *Leakage occurred during discharge, on DN100 DIRECTIONAL VALVE "AFT ENGINE ROOM (A)", has been detected and fixed ;*

f) *DN100 DISCHARGE MANIFOLD DN100 PRESSURE TEST at 60 Bar for 10 minutes. See attached pressure test report VP15-LI-101A ;*

g) *On the pilot cylinders,located during Co2 System activation sequence, one gasket was lacking (gasket located between nitrogen quick actionand pressure reducer).This was the reason that generated pressure loss inside directional valve control line*

h) *No. 74 CO_2 cylinders have been weighted relocated on their original rack position. Through discharge connection hoses have been connected to DN100 main discharge manifold ;*

i) *Complete functional test has been performed as per attached test protocol PO14-MA-002-A-B Rev.0. ZONE "A" has been tested without ESD sequence due to working in progress inside DG4 engine AFT area ;*

j) *All data checked during functional test have been recorded on the CO_2 MACHINERY SPACES TEST RECORD DATA: PO14-MA-002A Rev.0 :*

k) *At the end of the tests, all DISCHARGE HOSES / PNEUMATIC HOSES bending radius and hoses torques have been checked. Hoses have been installed in accordance with Manufacturer and regulations prescription (Bending radius) ;*

l) *During functional test the following certified equipment have been used :*

- *Pressure Gauge (0 ÷250 bar) No. MMAN21 Exp. Date July 2016 ;*
- *Torque Wrench N.668/20 – Serial Number mchl18 Expiring Certificate july 2016 ; (Chiave dinam.)*
- *Scale necessary to weight cylinders No Mbil 19 Exp. Date October 2016 (Bilancia)*

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At end of test we had a SATISFACTORY RESULTS. All test activities/data have been recorded on documents PO14-MA-003 2-1 / PO14-MA-003A Rev.1 Cylinder weight record ;

M&M in accordance with Customer will move forward with the inspection/test & maintenance accordingly to the updated protocols of maintenance & service (depending on Ship Class) issued by Manufacturer / Customer / Flags . This document has been previously delivered and is part of PMSS;

After performing all tests CO2 system has been left in operation;

M&M recommended to lock all vent valves, located on the discharge manifold and on the pneumatic control line in closed position to avoid mistakes in case of operation

For the future, to maintain the system always in right operation, M&M strongly recommend the following actions :

a) **Perform CO_2 system maintenance instructions in accordance with maintenance procedures released by the Manufacturer / Class / Flag /CCL Circulars. Schedule must be strictly followed and observed.**

b) **Record all data checked during Maintenance on suitable BOARD RECORD BOOK (PMSS CARDS);**

REFERENCE DRAWINGS USED DURING THE ACTIVITIES : A5D230240-SH19/21 REV.1

All tests have been completed on September 12th 2015 and the CO_2 SYSTEM has been left in operation.

In the meantime, all hoses threaded connections (Discharge / Pneumatic lines) have been checked and marked with RED paint, just to fix the final TORQUE position.

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REMARKS :

Attendees :

M&M	[redacted]
CCL	

INSPECTION RESULT SATISFACTORY ■ NOT ACCEPTABLE □

COMPANY:	**M & M**	**CCL**	**CCL**	**LR**
Name	[redacted]			
Role	*Senior Chief Technician Senior Technician*	*Staff Captain*	*Chief Engineer*	*Engineer*
Date	*Sept. 12th 2015*	*Sep. 12th 2015*	*Sep. 12th 2015*	*Sep. 12th 2015*
Signature	[redacted]			

Certificato
Nr. 1128-0115
Del 15/01/2015

RAPPORTO DI TARATURA

Accuracy report

Cliente	MOZZANICA & MOZZANICA S.r.l.	*Customer*
Ordine n°	29	*Order nr*
Articolo	100R250.30	*Article*
Campo	250 Bar	*Range*
Precisione	1,0%	*Accuracy*
Matricola	MMAN21	*Serial nr.*
Diametro	100 mm	*Dial*

La seguente prova è stata effettuata con:
The following test has been made by:

- ☐ Manometro digitale LAM DMM 1 Matricola 914471 con certificato ACCREDIA (LAT 093) n° 190813P del 06.12.13
- ☐ Manometro digitale LAM DMM 5 Matricola 812994 con certificato ACCREDIA (LAT 093) n° 139514P del 28.07.14
- ☐ Manometro digitale LAM DMM 50 Matricola 55296 con certificato ACCREDIA (LAT 093) n° 5743P del 08.04.13
- ■ Manometro digitale LAM DMM 500 Matricola 54693 con certificato ACCREDIA (LAT 093) n° 57513P del 08.04.13
- ☐ Manometro digitale LAM DMM 1000 Matricola 916570 con certificato ACCREDIA (LAT 093) n° 911214P del 23.09.14

Utilizzando l'Istruzione Operativa IST 08 01 in accordo con la normativa UNI EN 837.1
According our system operating procedure nr IST 08 01 according UNI EN 837.1 Norms

Pressione nominale *Nominal pressure*	Valore Indicato *Indicated value*	Errore di indicazione *Error indication*	Errore *Error*
50	51,15	1,150	0,5%
100	101,60	1,600	0,6%
150	152,00	2,000	0,8%
200	202,10	2,100	0,8%
250	251,00	1,000	0,4%
200	202,00	2,000	0,8%
150	151,80	1,800	0,7%
100	101,65	1,650	0,7%
50	51,00	1,000	0,4%

FONDO SCALA :	250	*Full Scale*
Max Errore riferito a 250 Bar (Emax)	0,8%	*Max Error ref 250 Bar (Emax)*
Classe di precisione (Kl.)	1,0%	*Accuracy (Kl.)*
Incertezza del Procedimento (It)	0,075%	*Uncertainty process (It)*
Suddivisione scala manometro Campione (Bar)	0,05	*Test gauge range subdivision (Bar)*
Incertezza dello Strumento in Taratura (Im)	**0,84%**	*Uncertainty of gauge (Im)*
Risultato della prova :	**CONFORME / Conform**	*Test result*

INCERTEZZA DEL PROCEDIMENTO DI TARATURA / *UNCERTAINTY PROCESS*
Incertezza di misura del procedimento di Taratura (It) = Incertezza di misura dello strumento campione (Ip) + Incertezza dell'indicazione dello strumento in taratura(Is)
The uncertainty accuracy process (It) = uncertainty test gauge (Ip) + uncertainty gauge pointer (Is)

INCERTEZZA DELLO STRUMENTO IN TARATURA / *UNCERTAINTY PRESSURE GAUGE*
Incertezza dello strumento in taratura (Im) è data dalla formula / *Uncertainty of pressare gauge (Im) result from formula*

$$\sqrt{Im = (It^2 + Emax^2)}$$

[redacted] S.r.l.
[redacted]no

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CERTIFICATO DI PRESSATURA
PRESSURE TEST REPORT

Collaudo N° / **Test No**	**VP15-LI-101A**	**Data** / Date : **09/12/2015**
Commessa / **Job**	**LIBERTY**	
Cliente / **Customer**	**CARNIVAL CRUISE LINES - CARNIVAL LIBERTY**	
Località / **Site**	**SAN JUAN - PORTORICO**	

Oggetto / Subject : **HP CO2 SYSTEM – MACHINERY SPACES**
CO_2 DISCHARGE MANIFOLD DN 100 mm PRESSURE TEST
(UPSTREAM DIRECTIONAL VALVES)

In data **09/12/2015** è stato pressato l'impianto antincendio in oggetto alla pressione Di ***60 bar,*** per un periodo di ***10 minuti*** , senza riscontrare alcuna perdita.

On date 09/12/2015 the system above mentioned has been tested at 60 bar, for 10 minutes without leakages ;

DATI TEST / *TEST DATA*	
Disegni di riferimento / ***Reference drawings***	A5D230240-SH19 / SH21 REV-1
Classe di linea tubazioni / ***Piping class***	GALVANIZED CARBON STEEL SCHED. 80
Classe di linea raccordi / ***Fittings class***	PN160
Pressione di lavoro / ***Working pressure***	51 bar (Nominal Pressure) – 125 bar Max WP
Manifold Pressione di prova /***Test pressure***	60 bar
Fluido utilizzato / ***Fluid used for test***	NITROGEN
Fluido utilizzato / ***Fluid used for test***	Nitrogen (USA Cylinder 175 bar)
Temperatura ambiente in CO_2 Room / ***CO_2 Room environment temperature***	30°C ÷ 35°C
Manometro utilizzato / ***Pressure gauge used***	MMAN21
*Flussaggio dopo Test / **Flushing after testing***	*60 bar for 1 minute*

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REMARKS :	
Attendees :	
M&M	[redacted]
CCL	

INSPECTION RESULT — SATISFACTORY ■ — NOT ACCEPTABLE ☐

COMPANY:	**M & M**	**CCL**	**CCL**	**LR**
Name	[redacted]			
Role	*Senior Chief Technician* *Senior Technician*	*Staff Captain*	*Chief Engineer*	Senior Surveyor *Engineer*
Date	*Sept. 12th 2015*	*Sep. 12th 2015*	*Sep. 12th 2015*	*Sep. 12th 2015*
Signature	[redacted]			

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CERTIFICATO DI PRESSATURA
PRESSURE TEST REPORT

Collaudo N° / Test No	**VP15-LI-102A**	**Data** / Date : **09/12/2015**
Commessa / Job	**LIBERTY**	
Cliente / Customer	**CARNIVAL CRUISE LINES - CARNIVAL LIBERTY**	
Località / Site	**SAN JUAN - PORTORICO**	

Oggetto / Subject : **HP CO2 SYSTEM – MACHINERY SPACES**
CO_2 PIPING CONTROL LINES DN 12 mm – PNEUMATIC PRESSURE TEST
ZONES A-B-C

In data **09/12/2015** è stato pressato l'impianto antincendio in oggetto alla pressione di ***50 bar***, per un periodo di ***10 minuti***, senza riscontrare alcuna perdita.

On date 09/12/2015 the system above mentioned has been tested at 50 bar, for 10 minutes without leakages ;

DATI TEST / *TEST DATA*	
Disegni di riferimento / ***Reference drawings***	A5D230240-SH19 / SH21 REV-1
Classe di linea tubazioni / ***Piping class***	EN 10216/5 TC2/ASTM A 312 – ASME SA 312 UNS 831635 TP 316Ti /1 4571 – 12 x 1,2 MM
Classe di linea raccordi / ***Fittings class***	AISI 316 Compression fittings
Pressione di lavoro / ***Working pressure***	50 bar
Pressione di prova / ***Test pressure***	50 bar
Fluido utilizzato / ***Fluid used for test***	Nitrogen (USA Cylinder 175 bar)
Temperatura ambiente in CO_2 Room / ***CO_2 Room environment temperature***	30°C ÷ 35°C
Manometro utilizzato / ***Pressure gauge used***	MMAN21
Flussaggio dopo Test / ***Flushing after testing***	***10 ÷ 20 bar for 1 minutes***

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WORLDWIDE FIRE FIGHTING SOLUTIONS

REMARKS :	
Attendees :	
M&M	[redacted]
CCL	
INSPECTION RESULT	SATISFACTORY ■ NOT ACCEPTABLE ☐

COMPANY:	**M & M**	**CCL**	**CCL**	**LR**
Name	[redacted]			
Role	*Senior Chief Technician* *Senior Technician*	*Staff Captain*	*Chief Engineer*	*Engineer*
Date	*Sept. 12th 2015*	*Sep. 12th 2015*	*Sep. 12th 2015*	*Sep. 12th 2015*
Signature	[redacted]			

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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 TEST RECORD DATA MACHINERY SPACES

Vessel: LIBERTY **Date: Sept.12/2015**

Job:

Doc. no: PO14-MA-002A-1

Rev. : 2-March 2015

Sh. : 1 of 9

ACTIONS	ALARMS	MCB A CO2 ROOM	MCB A ECR	MCB B CO2 ROOM	MCB B ECR	MCB C CO2 ROOM	MCB C ECR	MCB D	MCB D	MCB E CO2 ROOM	MCB E ECR	MCB F CO2 ROOM	MCB F ECR	MCB G CO2 ROOM	MCB G ECR	MCB H CO2 ROOM	MCB H ECR	MCB I CO2 ROOM	MCB I ECR
OPEN CO2 ROOM MANUAL CONTROL DOOR and ckeck ALARMS on both Control panels MASTER /SLAVE;	PREWARNING	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	CHECK ACUSTICAL ALARMS INSIDE SELECTED SPACE/S	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	CHECK OPTICAL ALARMS INSIDE SELECTED SPACE/S	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

Legend: Y/OK= EXPECTED VALUE/DATA
NO = FAILED
ND = NOT DONE

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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 TEST RECORD DATA MACHINERY SPACES

Vessel: LIBERTY Date: Sept.12/2015

Job:

Doc. no: **PO14-MA-002A-1**

Rev. : 2-March 2015

Sh. : 2 of 9

ACTIONS	ALARMS	MCB A CO2 ROOM	MCB A ECR	MCB B CO2 ROOM	MCB B ECR	MCB C CO2 ROOM	MCB C ECR	MCB D -	MCB D -	MCB E CO2 ROOM	MCB E ECR	MCB F CO2 ROOM	MCB F ECR	MCB G CO2 ROOM	MCB G ECR	MCB H CO2 ROOM	MCB H ECR	MCB I CO2 ROOM	MCB I ECR
TURN DOWN MANUAL CONTROL BOX (CO_2 Room) RIGHT VALVE HANDLE and check CO_2 DIRECTIONAL VALVE OPENING;	**CHECK THE FOLLOWING ALARMS on BOTH CONTROL PANELS MAIN (CO_2 ROOM) and SLAVE (ECR) :**																		
Reset ESD system by MASTER or SLAVE panels before proceeding with next MCB;		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Repeat the same sequence for ECR MANUAL CONTROL BOX;																			

Legend: Y/OK= EXPECTED VALUE/DATA
NO = FAILED
ND = NOT DONE

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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 TEST RECORD DATA MACHINERY SPACES

Vessel: LIBERTY Date: Sept.12/2015

Job:

Doc. no: **PO14-MA-002A-1**

Rev. : 2-March 2015

Sh. : 3 of 9

	a) LINE DIRECTIONAL VALVE SELECTED;	OK	OK	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	b) DIRECTIONAL VALVE OPEN;	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	c) CO_2 ROOM PILOT SOLENOID ACTUATION;	OK	OK	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	d) ECR PILOT SOLENOID ACTUATION;	OK	OK	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	e) ESD SEQUENCE COMPLETED / FAILED (After blinking for 2 minutes);	OK	OK	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Legend: Y/OK= EXPECTED VALUE/DATA
NO = FAILED
ND = NOT DONE

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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 TEST RECORD DATA MACHINERY SPACES

Vessel: LIBERTY Date: Sept.12/2015

Job:

Doc. no: PO14-MA-002A-1

Rev. : 2-March 2015

Sh. : 4 of 9

ACTIONS	ALARMS	MCB A CO2 ROOM	MCB A ECR	MCB B CO2 ROOM	MCB B ECR	MCB C CO2 ROOM	MCB C ECR	MCB D	MCB D	MCB E CO2 ROOM	MCB E ECR	MCB F CO2 ROOM	MCB F ECR	MCB G CO2 ROOM	MCB G ECR	MCB H CO2 ROOM	MCB H ECR	MCB I CO2 ROOM	MCB I ECR
TURN DOWN MANUAL CONTROL BOX (CO_2 Room) LEFT VALVE HANDLE and check CO_2 CYLINDER BANK/BANKS ACTIVATION. ***Reset ESD system by MASTER or SLAVE panels before proceeding with next MCB;*** *Repeat the same sequence for ECR MANUAL CONTROL BOX;*	**CHECK PNEUMATIC ACTUATOR PINS POSITION** **RELEASE / ARMED**	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

Legend: Y/OK= EXPECTED VALUE/DATA
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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 TEST RECORD DATA MACHINERY SPACES

Vessel: LIBERTY Date: Sept.12/2015

Job:

Doc. no: PO14-MA-002A-1

Rev. : 2-March 2015

Sh. : 5 of 9

	CHECK THE FOLLOWING ALARMS on BOTH CONTROL PANELS MAIN (CO_2 ROOM) and SLAVE (ECR) :	OK	OK															
	a) BOTTLE BANK SELECTED;	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	b) GAS RELEASED; (Discharge Pressure switch will be manually operated;	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

Legend: Y/OK= EXPECTED VALUE/DATA
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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 TEST RECORD DATA MACHINERY SPACES

Vessel: LIBERTY Date: Sept.12/2015

Job:

Doc. no: PO14-MA-002A-1

Rev. : 2-March 2015

Sh. : 6 of 9

ACTIONS	CHECK	MCB A CO2 ROOM	MCB A ECR	MCB B CO2 ROOM	MCB B ECR	MCB C CO2 ROOM	MCB C ECR	MCB D	MCB D	MCB E CO2 ROOM	MCB E ECR	MCB F CO2 ROOM	MCB F ECR	MCB G CO2 ROOM	MCB G ECR	MCB H CO2 ROOM	MCB H ECR	MCB I CO2 ROOM	MCB I ECR
Check cylinder BANK / BANKS operated.		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	CYLINDER BANK/S OPERATED MUST BE IN ACCORDANCE WITH SYSTEM DESIGN:	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	ZONE "A" BANKS 3 – 4	OK	OK																
	ZONE "B" BANKS 1-2-3-4			OK	OK														
	ZONE "C" BANK 1-3-4					OK	OK												
	ZONE "D" Bank 1							OK	OK										
	ZONE "E" BANKS 1-3-									OK	OK								
	ZONE "F" BANK 1											OK	OK						

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Legend: Y/OK= EXPECTED VALUE/DATA
NO = FAILED
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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 TEST RECORD DATA MACHINERY SPACES

Vessel: LIBERTY Date: Sept.12/2015

Job:

Doc. no: **PO14-MA-002A-1**

Rev. : 2-March 2015

Sh. : 7 of 9

	ZONE "G" BANKS 2													OK	OK				
	ZONE "H" BANKS 1															OK	OK		
	ZONE "I" BANK 2-3																	OK	OK

Legend: Y/OK= EXPECTED VALUE/DATA
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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 TEST RECORD DATA MACHINERY SPACES

Vessel: LIBERTY Date: Sept.12/2015

Job:

Doc. no: **PO14-MA-002A-1**

Rev. : 2-March 2015

Sh. : 8 of 9

ACTIONS	ALARMS	MCB A CO2 ROOM	MCB A ECR	MCB B CO2 ROOM	MCB B ECR	MCB C CO2 ROOM	MCB C ECR	MCB D	MCB D	MCB E CO2 ROOM	MCB E ECR	MCB F CO2 ROOM	MCB F ECR	MCB G CO2 ROOM	MCB G ECR	MCB H CO2 ROOM	MCB H ECR	MCB I CO2 ROOM	MCB I ECR
CHECK and CO_2 MANIFOLD and PILOT LINES PRESSURE SWITCHES: **(Pressure switches will be manually operated;**	**CHECK THE FOLLOWING ALARMS on BOTH CONTROL PANELS MAIN (CO_2 ROOM) and SLAVE (ECR) :**	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	a) Manifold pressurized;	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	b) Pilot manifold pressurized;	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Reset the system.		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

Legend: Y/OK= EXPECTED VALUE/DATA
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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 TEST RECORD DATA MACHINERY SPACES

Vessel: LIBERTY **Date: Sept.12/2015**

Job:

Doc. no: **PO14-MA-002A-1**

Rev. : 2-March 2015

Sh. : 9 of 9

REMARKS :

	Inspection result:	SATISFACTORY ■	UNSATISFACTORY □ :
Position	**M & M**	**CCL**	**Lloyd's**
NAME	[redacted]		
ROLE	*Senior Technician* *Senior Technician*	*Staff Captain* *Chief Engineer*	*Engineer*
DATE	*September 12th 2015*	*September 12th 2015*	*September 12th 2015*
SIGNATURE	[redacted]		

Legend: Y/OK= EXPECTED VALUE/DATA
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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 CYLINDERS WEIGHING RECORD

Vessel: LIBERTY Date: Sept.12/2015

Job : CO2 SYSTEM

Doc. no: PO14-MA-003A

Rev. : 2 March 2015

Sh. : 1 of 7

CYLINDER BANK	CO_2 CYLINDER No.	CO_2 CYLINDER SERIAL NUMBER	CO_2 CYLINDER CAPACITY l	CO_2 CYLINDER NOMINAL CHARGE kg	CO_2 CYLINDER TARE - kg (cyl.tare + deep tube (0,2 kg) + valve (1 kg)	CO_2 CYLINDER TOTAL WEIGHT VALUE READING - kg (cylinder gross weight)	CO_2 CHARGE WEIGHT - kg (difference between tare and weight reading)	CO_2 CHARGE MINIMUN WEIGHT - kg (95% of the CO_2 cylinder nominal charge)	LAST HYDROSTATIC TEST
BANK 3	1	592589	60,l	40 kg	64,1	105,2	41,1	38,0	09/2015
BANK 3	2	592514	60,l	40 kg	65,0	104,4	39,4	38,0	09/2015
BANK 3	3	592570	60,l	40 kg	62,7	104,0	41,3	38,0	09/2015
BANK 3	4	592524	60,l	40 kg	63,2	108,2	45,0	38,0	09/2015
BANK 3	5	592571	60,l	40 kg	62,7	107,0	44,3	38,0	09/2015
BANK 3	6	592513	60,l	40 kg	64,9	105,8	40,9	38,0	09/2015
BANK 3	7	592593	60,l	40 kg	65,4	106,4	41,0	38,0	09/2015
BANK 3	8	592557	60,l	40 kg	63,5	106,0	42,5	38,0	09/2015
BANK 3	9	592595	60,l	40 kg	64,4	106,6	42,2	38,0	09/2015
BANK 3	10	592511	60,l	40 kg	64,9	105,4	40,5	38,0	09/2015
BANK 3	11	592569	60,l	40 kg	65,3	106,4	41,1	38,0	09/2015
BANK 3	12	592599	60,l	40 kg	64,8	106,2	41,4	38,0	09/2015
BANK 3	13	592641	60,l	40 kg	63,2	106,0	42,8	38,0	09/2015
BANK 3	14	592525	60,l	40 kg	63,4	106,0	42,6	38,0	09/2015

Legend: Y/OK= EXPECTED VALUE/DATA

NO = FAILED

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ABS APPROVED SERVICE SUPPLIER No. 446881-2747915-001

GLC APPROVED SERVICE SUPPLIER No. MIL-16-0476

MNWR rev. 2 on 02.03.2015

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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 CYLINDERS WEIGHING RECORD

Vessel: LIBERTY Date: Sept.12/2015

Job : CO2 SYSTEM

Doc. no: **PO14-MA-003A**

Rev. : 2 March 2015

Sh. : 2 of 7

CYLINDER BANK	CO_2 CYLINDER No.	CO_2 CYLINDER SERIAL NUMBER	CO_2 CYLINDER CAPACITY l	CO_2 CYLINDER NOMINAL CHARGE kg	CO_2 CYLINDER TARE - kg (cyl.tare + deep tube (0,2 kg) + valve (1 kg)	CO_2 CYLINDER TOTAL WEIGHT VALUE READING - kg (cylinder gross weight)	CO_2 CHARGE WEIGHT - kg (difference between tare and weight reading)	CO_2 CHARGE MINIMUN WEIGHT - kg (95% of the CO_2 cylinder nominal charge)	LAST HYDROSTATIC TEST
BANK 3	15	592550	60,l	40 kg	63,3	108,4	45,0	38,0	09/2015
BANK 3	16	592539	60,l	40 kg	63,7	105,8	42,1	38,0	09/2015
BANK 3	17	592602	60,l	40 kg	63,9	106,2	42,3	38,0	09/2015
BANK 3	18	592572	60,l	40 kg	64,3	105,8	41,5	38,0	09/2015
BANK 4	1	592544	60,l	40 kg	64,8	107,8	43,0	38,0	09/2015
BANK 4	2	592536	60,l	40 kg	63,1	107,0	43,9	38,0	09/2015
BANK 4	3	592552	60,l	40 kg	62,9	105,6	42,7	38,0	09/2015
BANK 4	4	592576	60,l	40 kg	64,4	105,8	41,4	38,0	09/2015
BANK 4	5	592533	60,l	40 kg	63,3	104,2	40,9	38,0	09/2015
BANK 4	6	592597	60,l	40 kg	65,3	106,6	41,3	38,0	09/2015
BANK 4	7	592531	60,l	40 kg	62,8	104,4	41,6	38,0	09/2015
BANK 4	8	592568	60,l	40 kg	65,0	106,4	41,4	38,0	09/2015
BANK 4	9	592556	60,l	40 kg	64,6	106,4	41,8	38,0	09/2015
BANK 4	10	592542	60,l	40 kg	63,3	105	41,7	38,0	09/2015

Legend: Y/OK= EXPECTED VALUE/DATA

NO = FAILED

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APPROVED SERVICE SUPPLIER No. 2014/MI/01/451

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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 CYLINDERS WEIGHING RECORD

Vessel: LIBERTY Date: Sept.12/2015

Job : CO2 SYSTEM

Doc. no: PO14-MA-003A

Rev. : 2 March 2015

Sh. : 3 of 7

CYLINDER BANK	CO_2 CYLINDER No.	CO_2 CYLINDER SERIAL NUMBER	CO_2 CYLINDER CAPACITY l	CO_2 CYLINDER NOMINAL CHARGE kg	CO_2 CYLINDER TARE - kg (cyl.tare + deep tube (0,2 kg) + valve (1 kg)	CO_2 CYLINDER TOTAL WEIGHT VALUE READING - kg (cylinder gross weight)	CO_2 CHARGE WEIGHT - kg (difference between tare and weight reading)	CO_2 CHARGE MINIMUN WEIGHT - kg (95% of the CO_2 cylinder nominal charge)	LAST HYDROSTATIC TEST
BANK 4	11	592564	60,l	40 kg	62,4	106,2	43,8	38,0	09/2015
BANK 4	12	592594	60,l	40 kg	66,1	106,0	39,9	38,0	09/2015
BANK 4	13	592537	60,l	40 kg	64,7	107,0	42,3	38,0	09/2015
BANK 4	14	592563	60,l	40 kg	62,7	104,6	41,9	38,0	09/2015
BANK 4	15	592577	60,l	40 kg	64,3	106,2	41,9	38,0	09/2015
BANK 4	16	592554	60,l	40 kg	64,2	105,8	41,6	38,0	09/2015
BANK 4	17	592560	60,l	40 kg	65,7	105,6	39,9	38,0	09/2015
BANK 4	18	592566	60,l	40 kg	64,3	108,2	43,9	38,0	09/2015
BANK 4	19	592549	60,l	40 kg	63,3	105,4	42,1	38,0	09/2015
BANK 4	20	592547	60,l	40 kg	65,1	106,8	41,7	38,0	09/2015
BANK 4	21	592520	60,l	40 kg	62,8	105,2	42,4	38,0	09/2015
BANK 4	22	592574	60,l	40 kg	64,4	106,4	42,0	38,0	09/2015
BANK 4	23	592553	60,l	40 kg	63,7	109,2	45,5	38,0	09/2015
BANK 4	24	592515	60,l	40 kg	64,2	106,8	42,5	38,0	09/2015

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Legend: Y/OK= EXPECTED VALUE/DATA

NO = FAILED

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WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 CYLINDERS WEIGHING RECORD

Vessel: LIBERTY Date: Sept.12/2015

Job : CO2 SYSTEM

Doc. no. **PO14-MA-003A**

Rev. : 2 March 2015

Sh. : 4 of 7

CYLINDER BANK	CO_2 CYLINDER No.	CO_2 CYLINDER SERIAL NUMBER	CO_2 CYLINDER CAPACITY l	CO_2 CYLINDER NOMINAL CHARGE kg	CO_2 CYLINDER TARE - kg (cyl.tare + deep tube (0,2 kg) + valve (1 kg)	CO_2 CYLINDER TOTAL WEIGHT VALUE READING - kg (cylinder gross weight)	CO_2 CHARGE WEIGHT - kg (difference between tare and weight reading)	CO_2 CHARGE MINIMUN WEIGHT - kg (95% of the CO_2 cylinder nominal charge)	LAST HYDROSTATIC TEST
BANK 4	25	592562	60,l	40 kg	63,2	107,0	43,8	38,0	09/2015
BANK 4	26	592591	60,l	40 kg	63,0	107,2	44,2	38,0	09/2015
BANK 4	27	592555	60,l	40 kg	63,6	105,6	42,0	38,0	09/2015
BANK 4	28	592519	60,l	40 kg	62,8	104,6	41,8	38,0	09/2015
BANK 4	29	592588	60,l	40 kg	62,0	106,6	44,6	38,0	09/2015
BANK 4	30	592559	60,l	40 kg	63,1	103,8	40,7	38,0	09/2015
BANK 4	31	592551	60,l	40 kg	63,6	106,0	42,4	38,0	09/2015
BANK 4	32	592510	60,l	40 kg	64,2	105,6	41,4	38,0	09/2015
BANK 4	33	592558	60,l	40 kg	65,2	108,6	43,4	38,0	09/2015
BANK 4	34	592534	60,l	40 kg	62,9	104,8	41,9	38,0	09/2015
BANK 4	35	592523	60,l	40 kg	63,5	107,0	43,5	38,0	09/2015
BANK 4	36	592578	60,l	40 kg	64,0	106,0	42,0	38,0	09/2015
BANK 4	37	592538	60,l	40 kg	63,3	102,4	39,1	38,0	09/2015
BANK 4	38	592526	60,l	40 kg	64,3	106,6	42,3	38,0	09/2015

Legend: Y/OK= EXPECTED VALUE/DATA

NO = FAILED

Lloyd's Register APPROVED SERVICE SUPPLIER No. GEN1490347

APPROVEDSERVICE SUPPLIER No. 2014/MI/01/451

ABS APPROVED SERVICE SUPPLIER No. 445881-2747915-001

GL APPROVED SERVICE SUPPLIER No. MIL-15-5478

MOZZANICA & MOZZANICA S.r.L.
Fire Protection Engineering
OIL & GAS - MARINE CONSULTANTS

MOZZANICA

WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 CYLINDERS WEIGHING RECORD

Job : CO2 SYSTEM

Doc. no: PO14-MA-003A

Rev. : 2 March 2015

Sh. : 5 of 7

Vessel: LIBERTY Date: Sept.12/2015

CYLINDER BANK	CO_2 CYLINDER No.	CO_2 CYLINDER SERIAL NUMBER	CO_2 CYLINDER CAPACITY l	CO_2 CYLINDER NOMINAL CHARGE kg	CO_2 CYLINDER TARE - kg (cyl.tare + deep tube (0,2 kg) + valve (1 kg)	CO_2 CYLINDER TOTAL WEIGHT VALUE READING - kg (cylinder gross weight)	CO_2 CHARGE WEIGHT - kg (difference between tare and weight reading)	CO_2 CHARGE MINIMUN WEIGHT - kg (95% of the CO_2 cylinder nominal charge)	LAST HYDROSTATIC TEST
BANK 4	39	592592	60,l	40 kg	64,6	106,0	41,4	38,0	09/2015
BANK 4	40	592579	60,l	40 kg	64,5	108,2	43,7	38,0	09/2015
BANK 4	41	592567	60,l	40 kg	64,5	107,0	42,5	38,0	09/2015
BANK 4	42	592575	60,l	40 kg	64,4	104,4	40,0	38,0	09/2015
BANK 4	43	592518	60,l	40 kg	63,5	104,8	41,3	38,0	09/2015
BANK 4	44	592565	60,l	40 kg	62,8	106,0	43,2	38,0	09/2015
BANK 4	45	592605	60,l	40 kg	64,6	103,4	38,8	38,0	09/2015
BANK 4	46	592548	60,l	40 kg	63,7	107,8	44,1	38,0	09/2015
BANK 4	47	592561	60,l	40 kg	66,2	108,8	42,2	38,0	09/2015
BANK 4	48	592573	60,l	40 kg	64,6	106,4	41,8	38,0	09/2015
BANK 4	49	592540	60,l	40 kg	63,6	106,6	43,0	38,0	09/2015
BANK 4	50	592590	60,l	40 kg	64,9	105,0	40,1	38,0	09/2015
BANK 4	51	592532	60,l	40 kg	62,6	104,4	41,8	38,0	09/2015
BANK 4	52	592521	60,l	40 kg	64,0	106,4	42,4	38,0	09/2015

Legend: Y/OK= EXPECTED VALUE/DATA

NO = FAILED

Lloyd's Register APPROVED SERVICE SUPPLIER No. GEN1490347

APPROVEDSERVICE SUPPLIER No. 2014/MI/01/451

ABS APPROVED SERVICE SUPPLIER No. 445681-2747915-001

GL APPROVED SERVICE SUPPLIER No. MIL-15-5478

MNWR rev. 2 on 02.03.2015

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MOZZANICA

WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 CYLINDERS WEIGHING RECORD

Vessel: LIBERTY Date: Sept.12/2015

Job : CO2 SYSTEM

Doc. no: **PO14-MA-003A**

Rev. : 2 March 2015

Sh. : 6 of 7

CYLINDER BANK	CO2 CYLINDER No.	CO2 CYLINDER SERIAL NUMBER	CO2 CYLINDER CAPACITY l	CO2 CYLINDER NOMINAL CHARGE kg	CO2 CYLINDER TARE - kg (cyl.tare + deep tube (0,2 kg) + valve (1 kg)	CO2 CYLINDER TOTAL WEIGHT VALUE READING - kg (cylinder gross weight)	CO2 CHARGE WEIGHT - kg (difference between tare and weight reading)	CO2 CHARGE MINIMUN WEIGHT - kg (95% of the CO2 cylinder nominal charge)	LAST HYDROSTATIC TEST
BANK 4	53	592522	60,l	40 kg	63,0	103,4	40,4	38,0	09/2015
BANK 4	54	592512	60,l	40 kg	65,2	108,2	43,0	38,0	09/2015
BANK 4	55	592509	60,l	40 kg	63,8	105,6	41,8	38,0	09/2015
BANK 4	56	909113	60,l	40 kg	66,9	106,4	39,5	38,0	09/2015
Pilot -co2	1	11/59952	27 l	35,4 kg	55 bar				02/2011
Pilot -co2	2	11/59945	27 l	36,5 kg	55 bar				02/2011
Pilot-ecr	1	06/2186	7 l	9,22 kg	85 bar				03/2013
Pilot-ecr	2	03/0930/109	7 l	10,7 kg	85 bar				03/2013

Legend: Y/OK= EXPECTED VALUE/DATA

NO = FAILED

Lloyd's Register APPROVED SERVICE SUPPLIER No. GEN1450347

APPROVEDSERVICE SUPPLIER No. 2014/MI/01/451

ABS APPROVED SERVICE SUPPLIER No. 445881-2747815-001

GL APPROVED SERVICE SUPPLIER No. MIL-15-6478

MNWR rev. 2 on 02.03.2015

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MOZZANICA

WORLDWIDE FIRE FIGHTING SOLUTIONS

CO_2 CYLINDERS WEIGHING RECORD

Job : CO2 SYSTEM

Doc. no: PO14-MA-003A

Rev. : 2 March 2015

Sh. : 7 of 7

Vessel: LIBERTY Date: Sept.12/2015

REMARKS :			
	Inspection result:	SATISFACTORY ■	UNSATISFACTORY □ :
Position	M & M	CCL	Lloyd's
NAME	[redacted]		
ROLE	*Senior Technician* *Senior Technician*	*Staff Captain* *Chief Engineer*	Senior Survey Engineer
DATE	September 12th 2015	September 12th 2015	September 12th 2015
SIGNATURE	[redacted]		

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Legend: Y/OK= EXPECTED VALUE/DATA

NO = FAILED

Lloyd's Register APPROVED SERVICE SUPPLIER No. GEN1490347 | APPROVED SERVICE SUPPLIER No. 2014/MI001451 | ABS APPROVED SERVICE SUPPLIER No. 445881-2747915-001 | GL APPROVED SERVICE SUPPLIER No. MIL-15-6478

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