Annex 1

Passenger Ship Safety Certificate

Lloyd's Register Passenger Ship Safety Certificate

This certificate shall be supplemented by a Record of Equipment (Form P) No: **6715342/08 07**

Issued under the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended, under the authority of the Government of the Republic of Cyprus by Lloyd's Register EMEA

For an international voyage

Particulars of Ship	
Name of ship*	**MV " THE CALYPSO"**
Distinctive number or letters	**C4LJ2**
Port of registry	**LIMASSOL**
Gross tonnage	**11,162.00**
Sea areas in which ship is certified to operate (regulation IV/2)	**A1 + A2 + A3**
IMO number	**6715372**
Date on which keel was laid[1]	**01 June 1965**

This is to certify:

1. that the ship has been surveyed in accordance with the requirements of regulation I/7 of the Convention;
2. that the survey showed that:
   2. the ship complied with the requirements of the Convention as regards:
      2.1. the structure, main and auxiliary machinery, boilers and other pressure vessels;
      2.1. the watertight subdivision arrangements and divisions;
      2.1. the following subdivision load lines:

Subdivision load lines assigned and marked on the ship's side at amidships (regulation II-1/13)	Freeboard	To apply when the spaces in which passengers are carried include the following alternative spaces
C.1	**2408**	**NOT ALTERNATIVE SPACES**
C.2	-	-
C.3	-	-

   2.2 the ship complied with the requirements of the Convention as regards structural fire protection, fire safety systems and appliances and fire control plans;
   2.3 the life-saving appliances and the equipment of the lifeboats, liferafts and rescue boats were provided in accordance with the requirements of the Convention;
   2.4 the ship was provided with a line-throwing appliance and radio installations used in life-saving appliances in accordance with the requirements of the Convention;
   2.5 the ship complied with the requirements of the Convention as regards to radio installations;
   2.6 the functioning of the radio installations used in life-saving appliances complied with the requirements of the Convention;
   2.7 the ship complied with the requirements of the Convention as regards shipborne navigational equipment, nautical publications and means of embarkation for pilots;
   2.8 the ship was provided with lights, shapes, means of making sound signals and distress signals in accordance with the requirements of the Convention and the International Regulations for Preventing Collisions at Sea in force;
   2.9 in all other respects the ship complied with the relevant requirements of the Convention;

3. that an Exemption Certificate **has not** been issued.

[1] *Date on which the keel was laid or ship was at a similar stage of construction or, where applicable, date on which work for a conversion or an alteration or modification of a major character was commenced.*

* *Delete as appropriate*

This certificate is valid until 24 July 2006.

Completion date of the survey on which this certificate is based **28 April 2005**

Issued at **PIRAEUS** on **18 April 2006**

Surveyors to Lloyd's Register EMEA

A member of the Lloyd's Register Group

Annex 2

Extracts from MSN 1775(M) and its Annex VI

Maritime and Coastguard Agency

MERCHANT SHIPPING NOTICE

MSN 1775 (M)

The Merchant Shipping (Port State Control) (Amendment) Regulations 2003

Notice to Shipowners, Agents, Ship Operators, Masters, Seafarers, Port Authorities, Pilots and Offshore Operators.

To be read in conjunction with the Merchant Shipping (Port State Control) Regulations 1995 SI 1995 No. 3128 as amended. The Annexes to this notice are an integral part of the regulations.

This notice supersedes MSN 1725 (M) and MSN 1753 (M).

Summary

This Notice consolidates guidance on the Merchant Shipping (Port State Control) Regulations 1995 and subsequent amendments, and contains all technical annexes to the Regulations (I to XIII).

It includes measures introduced by Directive 2001/106/EC transposed in UK legislation by the Merchant Shipping (Port State Control) (Amendment) Regulations 2003. The measures require -

- mandatory inspection of high risk ships
- mandatory expanded inspection
- a ban on high risk ships with a poor detention record
- detention for failure to carry a functioning voyage data recorder, if required by international rules
- improved transparency of port State inspection data

The 2003 regulations take effect from 22 July 2003

REGULATIONS

1. The Merchant Shipping (Port State Control) Regulations 1995 SI 1995 No. 3128 in force from 1 January 1996, implement European Directive 95/21/EC on Port State Control.

2. Directive 95/21/EC which originated in a European Commission's Communication *A Common Policy on Safe Seas* has since been amended by –

   - Directives 96/40/EC and 98/25/EC transposed into UK law by the Merchant Shipping (Port State Control) (Amendment) Regulations 1998, SI 1998 No. 1433 from 1 July 1998,
   - Directive 98/42/EC transposed into UK law by the Merchant Shipping (Port State Control) (Amendment No. 2) Regulations 1998, SI 1998 No. 2198 from 30 September 1998,
   - Directive 99/97/EC transposed into UK law by the Merchant Shipping (Port State Control) (Amendment) Regulations 2001, SI 2001 No. 2349 from 31 July 2001, and
   - Directives 2001/106/EC and 2002/84/EC implemented by the Merchant Shipping (Port State Control) (Amendment) Regulations 2003, SI 2003 No. 1636 from 22 July 2003.

CRITERIA FOR DETENTION OF A SHIP
(referred to in regulation 9)

Introduction

Before determining whether deficiencies found during an inspection warrant detention of the ship involved, the inspector must apply the criteria mentioned below in sections 1 and 2.

Section 3 includes examples of deficiencies that may for themselves warrant detention of the ship involved (see regulation 9).

Where the ground for detention is the result of accidental damage suffered on the ship's voyage to a port, no detention order shall be issued, provided that -

1. due account has been given to the requirements contained in Regulation 1/11(c) of SOLAS 74 regarding notification to the flag State administration, the nominated surveyor or the recognised organisation responsible for issuing the relevant certificates

2. prior to entering a port, the master or shipowner has submitted to the port State control authority details on the circumstances of the accident and the damage suffered and information about the required notification of the flag State administration

3. appropriate remedial action, to the satisfaction of the Authority, is being taken by the ship, and

4. the authority has ensured, having been notified of the completion of the remedial action, that deficiencies which were clearly hazardous to safety, health or the environment have been rectified.

1. Main Criteria

When exercising his professional judgement as to whether or not a ship should be detained the inspector must apply the following criteria -

Timing

Ships which are unsafe to proceed to sea must be detained upon the first inspection irrespective of how much time the ship will stay in port.

Criterion

The ship is detained if its deficiencies are sufficiently serious to merit an inspector returning to satisfy himself that they have been rectified before the ship sails.

The need for the inspector to return to the ship is a measure of the seriousness of the deficiencies. However, it does not impose such an obligation for every case. It implies that the Maritime and Coastguard Agency must verify one way or another, preferably by a further visit, that the deficiencies have been rectified before departure.

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[1] as amended by Council Directive 98/42/EC and Directive 2001/106/EC of the European Parliament and of the Council

2. Application of main criteria

When deciding whether the deficiencies found in a ship are sufficiently serious to merit detention the inspector must assess whether -

1. the ship has relevant, valid documentation

2. the ship has the crew required in the Minimum Safe Manning Document

During inspection the inspector must further assess whether the ship and/or crew is able to -

3. navigate safely throughout the forthcoming voyage

4. safely handle, carry and monitor the condition of the cargo throughout the forthcoming voyage

5. operate the engine room safely throughout the forthcoming voyage

6. maintain proper propulsion and steering throughout the forthcoming voyage

7. fight fires effectively in any part of the ship if necessary during the forthcoming voyage

8. abandon ship speedily and safely and effect rescue if necessary during the forthcoming voyage

9. prevent pollution of the environment throughout the forthcoming voyage

10. maintain adequate stability throughout the forthcoming voyage

11. maintain adequate watertight integrity throughout the forthcoming voyage

12. communicate in distress situations if necessary during the forthcoming voyage

13. provide safe and healthy conditions on board throughout the forthcoming voyage

14. provide the maximum of information in case of accident.

If the answers to any of these assessments is negative, taking into account all deficiencies found, the ship must be strongly considered for detention. A combination of deficiencies of a less serious nature may also warrant the detention of the ship

3. To assist the inspector in the use of these guidelines, there follows a list of deficiencies, grouped under relevant convention and/or Codes, which are considered of such a serious nature that they may warrant the detention of the ship involved. This list is not intended to be exhaustive.

However, the detainable deficiencies in the area of STCW 78 listed under item 3.8 below are the only grounds for detention under this Convention.

3.1. General

The lack of valid certificates and documents as required by the relevant instruments. However, ships flying the flag of States not party to a Convention (relevant instrument) or not having implemented another relevant instrument, are not entitled to carry the certificates provided for by the Convention or other relevant instrument. Therefore, absence of the required certificates should not by itself constitute reason to detain these ships. However, in applying the "no more favourable treatment" clause, substantial compliance with the provisions is required before the ship sails.

Annex 3

MSC/Circ 913 & 1082

INTERNATIONAL MARITIME ORGANIZATION

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Ref. T4/4.01

MSC/Circ.913
4 June 1999

GUIDELINES FOR THE APPROVAL OF FIXED WATER-BASED LOCAL APPLICATION FIRE-FIGHTING SYSTEMS FOR USE IN CATEGORY A MACHINERY SPACES

1 The Maritime Safety Committee, at its seventy-first session (19 to 28 May 1999), approved Guidelines for the approval of fixed water-based local application fire-fighting systems for use in category A machinery spaces, as set out in the annex.

2 Member Governments are requested to apply the annexed Guidelines when approving fixed water-based local application fire-fighting systems for use in category A machinery spaces.

***

ANNEX

GUIDELINES FOR THE APPROVAL OF FIXED WATER-BASED LOCAL APPLICATION FIRE-FIGHTING SYSTEMS

1 General

Fixed water-based local application fire-fighting systems should provide localized fire suppression in areas, as specified in SOLAS regulation II-2/7.7 for category A machinery spaces, without the necessity of engine shut-down, personnel evacuation, shutting down of forced ventilation fans or the sealing of the space.

2 Definitions

2.1 **Fire suppression**: A reduction in heat output from the fire and control of the fire to restrict its spread from its seat and reduce the flame area.

2.2 **Water-based extinguishing medium**: Fresh water or sea water with or without additives mixed to enhance fire-extinguishing capability.

3 Principal requirements for the system

3.1 The system should be capable of manual release.

3.2 The activation of the fire-fighting system should not result in loss of electrical power or reduction of the manoeuvrability of the ship.

3.3 The system should be capable of fire suppression based on testing conducted in accordance with the appendix to these guidelines.

3.4 The system should be capable of fire suppression with forced ventilation fans running and supplying air to the protected area, or a method of automatically shutting air supply fans upon release of the system should be provided to ensure that the fire-fighting medium is not dispersed.

3.5 The system should be available for immediate use and capable of continuously supplying water-based medium for at least 20 minutes in order to suppress or extinguish the fire and to prepare for the discharge of the main fixed fire-extinguishing system within that period of time.

3.6 The system and its components should be suitably designed to withstand ambient temperature changes, vibration, humidity, shock, impact, clogging and corrosion normally encountered in machinery spaces. Components within the protected spaces should be designed to withstand the elevated temperatures which could occur during a fire. Components should be tested in accordance with the relevant sections of appendix A of MSC/Circ.668, as amended by MSC/Circ.728.

3.7 The system and its components should be designed and installed based on international standards acceptable to the Organization*, and manufactured and tested in accordance with the appropriate elements of the Appendix to these guidelines.

3.8 The location, type and characteristics of the nozzles should be within the limits tested, as referred to in paragraph 3.3. Nozzle positioning should take into account obstructions to the spray of the fire-fighting system.

3.9 The electrical components of the pressure source for the system should have a minimum rating of IP 54. Systems requiring an external power source need only be supplied by the main power source.

3.10 The piping system should be sized in accordance with a hydraulic calculation technique** to ensure availability of flows and pressures required for correct performance of the system.

3.11 The water supply for local application systems may be fed from the supply to a water-based main fire-fighting system providing that adequate water quantity and pressure are available to operate both systems for the required period of time. Local application systems may form a section(s) of a water-based main fire-extinguishing system provided that all requirements of SOLAS regulation II-2/10 and these guidelines, and MSC/Circ.668, as amended by MSC/Circ.728, are met, and the systems are capable of being isolated from the main system.

3.12 The capacity and design of the system should be based on the protected area demanding the greatest volume of water.

3.13 The operation controls should be located at easily accessible positions inside and outside the protected space. The controls inside the space should not be liable to be cut off by a fire in the protected areas.

3.14 Pressure source components of the system should be located outside of the protected areas.

3.15 A means for testing the operation of the system for assuring the required pressure and flow should be provided.

3.16 Where automatically operated fire-fighting systems are installed, a warning notice should be displayed outside each entry point stating the type of medium used and the possibility of automatic release.

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*Pending the development of international standards acceptable to the Organization national standards as prescribed by the Administration should be applied.

**Where the Hazen-Williams Method is used, the following values of the friction factor "C" for different pipe types which may be considered should apply:

Pipe type	C
Black or galvanised mild steel	100
Copper and copper alloys	150
Stainless steel 150	

3.17 Operating instructions for the system should be displayed at each operating position.

3.18 Spare parts and operating and maintenance instructions for the system should be provided as recommended by the manufacturer.

3.19 Nozzles and piping should not prevent access to engine or machinery for routine maintenance. In ships fitted with overhead hoists or other moving equipment, nozzles and piping should not be located to prevent operation of such equipment.

APPENDIX

TEST METHOD FOR FIXED WATER-BASED LOCAL APPLICATION FIRE-FIGHTING SYSTEMS

1 SCOPE

This test method is for evaluating the effectiveness of fixed water-based local application fire-fighting systems. The test method verifies the design criteria for vertical and horizontal grids of nozzles. The test method is intended to evaluate maximum nozzle spacing, minimum and maximum distance from the nozzle to the hazard, minimum nozzle flow rate in addition to minimum and maximum operating pressure.

2 SAMPLING

2.1 The nozzles and other system components should be supplied by the manufacturer with design and installation criteria, operating instructions, drawings, and technical data sufficient for the identification of the components.

2.2 The flow rate for each type and size of nozzle should be determined at the minimum and maximum nozzle operating pressure.

3 FIRE TESTS

3.1 Test principles

3.1.1. These tests are intended to evaluate the fire-extinguishing capabilities of individual nozzles and grids of nozzles used as local application fire-fighting systems on light diesel oil fuel spray fires.

3.1.2 The tests also define the following design and installation criteria:

.1 maximum spacing between nozzles;

.2 minimum and maximum distance between the nozzles and the protected hazard;

.3 the need for nozzles to be positioned outside of the protected hazard; and

.4 minimum and maximum operating pressure.

3.2 Test description

3.2.1 Test enclosure

3.2.1.1 The test enclosure, if any, should be sufficiently large and provided with adequate natural or forced ventilation during the fire test to ensure that the oxygen concentration at the fire location during the fire test remains above 20% (by vol) without activation of the local application fire-fighting system.

3.2.1.2 The test enclosure, if any, should be at least 100 m^2 in area. The height of the test enclosure should be at least 5 m.

3.2.2 Fire scenarios

3.2.2.1 The fire scenarios should consist of nominal 1 and 6 MW spray fires. These fires should be produced using light diesel oil as the fuel as described in Table 3.2.2.1.

Table 3.2.2.1
Spray fire parameters

Spray nozzle	Wide spray angle (120° to 125°) full cone type	Wide spray angle (80°) full cone type
Nominal oil pressure	8 Bar	8.5 Bar
Oil flow	0.16 ± 0.01 kg/s	0.03 ± 0.005 kg/s
Oil temperature	20 ± 5°C	20 ± 5°C
Nominal heat release rate	6 MW	1 MW

3.2.2.2 The fuel spray nozzles should be installed horizontally and directed toward the centre of the nozzle grid.

3.2.2.3 The fuel spray nozzle should be located 1 m above the floor and at least 4 m away from the walls of the enclosure, if any.

3.2.3 Installation requirements for tests

3.2.3.1 The local application system should consist of uniformly spaced nozzles directed vertically downward.

3.2.3.2 The system should consist of either a 2 x 2 or 3 x 3 nozzle grid, as required.

3.2.3.3 The nozzles should be installed at least 1 m below the ceiling of the enclosure, if any.

3.2.3.4 The maximum spacing of the nozzles should be in accordance with the manufacturers system design and installation manual.

3.3 Test programme

3.3.1 The fire-extinguishing capabilities of the system should be evaluated for the minimum and maximum separation distances (the distance between the nozzle grid and the fuel spray nozzle). These distances should be as defined in the manufacturers system design and installation manual.

3.3.2 Each separation distance should be evaluated against the two fire scenarios (1 and 6 MW spray fires). Tests should be conducted with the fuel spray nozzles horizontally positioned in the following locations:

.1 under one nozzle in the centre of the grid;

.2 between two nozzles in the centre of the grid;

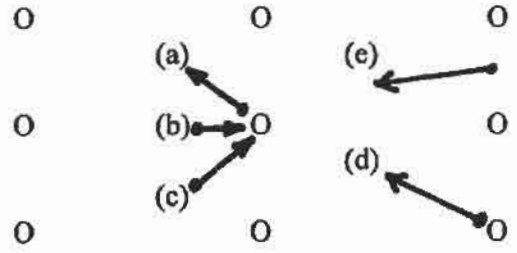
.3 between four nozzles;

.4 under one nozzle at the edge of the grid (corner); and

.5 between two nozzles at the edge of the grid.

These fire locations are shown in figure 3.3.2.

Figure 3.3.2
Fuel spray nozzle locations



O Water nozzle locations
ö Fuel spray nozzle location and direction
( ) Test designation

3.4 Test results and interpretation

3.4.1 The local application fire-fighting system is required to extinguish the test fires within 5 minutes from the start of water discharge. If the fire re-ignites after this five minute water discharge period the test is considered to be a failure.

3.4.2 The results of the tests should be interpreted as follows:

.1 *Systems (utilizing a 3 x 3 nozzle grid) that extinguish fires referred to in* 3.3.2.1 to 3.3.2.3 are considered to have successfully completed the protocol with the condition that the outer nozzles should be installed outside of the protected area a distance of at least 1/4 of the maximum nozzle spacing.

.2 Systems (utilizing either a 2 x 2 or 3 x 3 nozzle grid) that extinguish fires referred to in 3.3.2.3 to 3.3.2.5 are considered to have successfully completed the protocol and can be designed with the outer nozzles located at the edge of the protected area. This does not prohibit the location of the nozzles outside of the protected area.

.3 The requirements stated in either 3.4.2.1 or 3.4.2.2 should be met for both the minimum and maximum separation distances as well as the minimum and maximum operating pressures.

.4 For installations which may be adequately protected using individual nozzles or a single row of nozzles, the effective nozzle coverage (width and length) is defined as 1/2 the maximum nozzle spacing.

4 TEST PROCEDURE

4.1 Pre-burn time

Each fuel oil spray should be ignited and allowed to burn for no more than 15 seconds prior to system operation.

4.2 Measurements

4.2.1 Fuel oil spray system

4.2.1.1 The fuel oil flow rate and pressure in the fuel oil spray system should be verified prior to the test.

4.2.1.2 The fuel oil spray system pressure should be measured during the test.

4.2.2 Oxygen concentration at the fire location

Oxygen concentration should be measured at 100 mm below the fuel oil spray nozzle.

4.2.3 Water spray system pressure and flow rate

The system water pressure and flow rate should be measured using suitable equipment.

4.3 Operation of the fire-fighting system

4.3.1 The water spray system should be activated within the pre-burn time specified in section 4.1.

4.3.2 The water spray system should be operated for a minimum of one minute after fire extinguishment.

4.3.3 The fires should be extinguished within the 5 minutes of water application.

4.3.4 The fuel oil spray should be operated for at least 15 seconds after fire extinguishment.

4.4 Observations during the fire test

During the test, following observations should be recorded:

.1 start of the ignition procedure;

.2 start of the test (ignition);

.3 time when the extinguishing system is activated;

.4 time when the fire is extinguished;

.5 time when the extinguishing system is shut off;

.6 time of re-ignition;

.7 time when the fuel supply to the nozzle is stopped; and

.8 time when the test is terminated.

5 TEST REPORT

The test report should, as a minimum, include the following information:

.1 name and address of the test laboratory;

.2 date of issue and identification number of the test report;

.3 name and address of applicant;

.4 name and address of manufacturer or supplier of the product;

.5 test method and purpose;

.6 product identification;

.7 description of the tested product:

- .1 assembly drawings;
- .2 descriptions;
- .3 assembly of included materials and components;
- .4 specification of included materials and components;
- .5 installation specification; and
- .6 detailed drawings of the test set-up;

.8 date of tests;

.9 drawing of each fire test configuration;

.10 measured water spray nozzle flow characteristics;

.11 identification of the test equipment and used instruments;

.12 test results including observations and measurements made during and after the test:

- .1 maximum nozzle spacing;
- .2 minimum and maximum separation distances; and
- .3 minimum and maximum operating pressures;

.13 deviations from the test method;

.14 conclusions; and

.15 date of the report and signature.

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Ref. T4/4.01

MSC/Circ.1082
13 June 2003

UNIFIED INTERPRETATIONS OF THE GUIDELINES FOR THE APPROVAL OF FIXED WATER-BASED LOCAL APPLICATION FIRE-FIGHTING SYSTEMS (MSC/CIRC.913)

1 The Maritime Safety Committee, at its seventy-seventh session (28 May to 6 June 2003), with a view to ensuring uniform application of the Guidelines for the approval of fixed water-based local application fire-fighting systems (MSC/Circ.913), containing vague wording which is open to diverging interpretations, approved the unified interpretations relating to fixed water-based local application fire-extinguishing systems, set out in the annex.

2 Member Governments are invited to use the annexed unified interpretations as guidance when applying relevant provisions of the aforementioned guidelines and to bring them to the attention of all parties concerned.

***

ANNEX

UNIFIED INTERPRETATIONS OF THE GUIDELINES FOR THE APPROVAL OF FIXED WATER-BASED LOCAL APPLICATION FIRE-FIGHTING SYSTEMS (MSC/CIRC.913)

General interpretations

For the application of these Guidelines, the terms related to location are clarified as follows:

.1 *Protected space* is a machinery space where a local application fire-fighting system (hereinafter, referred to as "the system") is installed.

.2 *Protected area* is an area (an installation or a part of installation) within a protected space which is required to be protected by the system.

3 Principal requirements for the system*

Interpretation to paragraph 3.2

The activation of the system should not require engine shutdown, closing fuel oil tank outlet valves, evacuation of personnel and sealing of the space. Any of these actions would lead to loss of electrical power or reduction of manoeuvrability. Paragraph 3.2 is not intended to place requirements on electrical equipment.

Interpretation to paragraph 3.8

When the nozzle direction is intended not to be vertically downward, in addition to the type approval test in accordance with MSC/Circ.913, tests should be carried out in the conditions of actual direction of nozzles to verify the fire-extinguishing capabilities equivalent to that specified in MSC/Circ.913.

Interpretation to paragraph 3.9

This minimum rating should be applied only to the components in the protected space.

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* Refers to paragraph 3 of the Guidelines for the approval of fixed water-based local application fire-fighting systems, as annexed to MSC/Circ.913.

Annex 4

Technical Bulletin

Safety and the maintenance of the fuel supply system of Wärtsilä Vasa 32 engines

Engine type This Technical Bulletin concerns Wärtsilä Vasa 32 engines.

Letter distribution Wärtsilä NSD Service Network and owners/operators of Wärtsilä Vasa 32 engines.

Letter validity Until further notice.

General

During the long life span of the Wärtsilä Vasa 32 engines some incidents of serious fuel leakage in the low pressure fuel supply system have occurred and a few of these leakages have led to a fire. There are different reasons for the fuel leakages and the components involved vary depending on engine output stage and manufacturing year. Consequently measures to prevent the leakages, be it modification of design, welding method or maintenance routines, will vary according to engine output stage and manufacturing year.

Our service network as well as the engine owners have been informed about some of the modifications earlier (Technical Bulletin 3217T011GB, issue 02, date 1.8.1995). Since there are new revisions not included in the previous Technical Bulletin, Wärtsilä NSD has found it necessary to issue a new Technical Bulletin (3217T044GB) which contains an updated summary of the modifications.

The latest major modifications are:

- Fuel pipes between A and B bank on V-engines equipped with the "narrow" hot box (refer to section 3).
- Fuel pipes to and from injection pumps from the "narrow" hot box (refer to section 2.3).

1. Fuel pipes to and from fuel injection pumps

Spare parts number: 350 017 and 350 016

The fuel pipes to and from the fuel injection pumps are principally affected by:

- Pressure pulses deriving from the fuel injection pump.
- Vibrations initiated by normal engine vibration.
- Static stresses caused by heat expansion.

The aim of the modifications has been to dampen the pressure pulses and vibrations, and to strengthen the pipes, welding and screw connections. The correct version (material number) of fuel pipes is determined according to the type of hot box ("narrow" or "wide"), type of fuel injection pump and pipes (refer to section 2.2 and 2.3).

3. Fuel pipes between A and B banks on V-engines

3.1 General

Originally the fuel pipes between the banks at the free end of the engine had flanges made for two screws only. The present pipe design have flanges with four screws offering a considerably safer solution.

NOTE

The cylinder head at the free end of the engine on the B-bank should be removed in order to enable the modification.

3.2 V-engines equipped with the "narrow" hot box of three-pipe design

Refer to appendix 13 and 14.

A modification kit for four screw flanges and an extra support is available for engines with the "narrow" hot box. The pipes are prefabricated, but cutting of the existing pipes I and II, adjustment, as well as the final welding and drilling must be made on the engine. A drilling jig is required (shown in drawing 4V84B0195, appendix 15) for part of the drilling.

3.3 V-engines equipped with the "wide" hot box

Refer to appendix 7 and 8.

A modification kit for four screw flanges and an extra support is available for engines with the "wide" hot box. The pipes are prefabricated, but adjustment as well as the final welding and drilling must be made on the engine. A drilling jig is required (shown in drawing 4V84B0184, appendix 11) for part of the drilling.

NOTE

The distance piece 350467, part No. 7 (0036K142500), shown in appendix 7 and 8, is now modified to fit engines equipped with a nozzle cooling system as well as gas diesel engines. **All future modifications of V-engines equipped with the "wide" hot box should be done as per appendix 7 and 8 (thus appendix 9 and 10 from the previous Technical Bulletin 3217T011GB are omitted).**

3.4 Welding

The modification requires a qualified welder. Size of welding is according to appendix 12. Test pressure is 60 bar. General instructions for welding, according to document 4V35L0387, is available on request.

3.5 Ordering of modification kit

For engines equipped with the "narrow" hot box, the modification kit should be ordered according to module 3235A0232, shown in appendix 13 and 14.

For engines equipped with the "wide" hot box, the modification kit should be ordered according to module 3235A0200, shown in appendix 7 and 8.

5. Maintenance of the fuel supply system

NOTE Any fuel leakage is a potential hazard.

In addition to the instructions in the diesel engine instruction manual, Wärtsilä NSD recommends that following inspections are made after every 2000 running hours:

- Remove the hot box covers and look for possible fuel leakages. Fuel pipes on the high-pressure side MUST NOT be repair welded!
- Check systematically that all screws are in place. If screws have loosened or are opened – replace the O-rings and screws with new ones. Use original parts only!
- Check that fuel pipes have not become loose from their clamping – this will cause wear and eventually leakage.
- Ensure that the screws of the clamps are always tight to avoid above.

When mounting fuel injection pumps on the engine, follow the alignment instructions in Chapter 16 in the diesel engine instruction manual. Make sure that the fixing bolts are correctly tightened according to diesel engine instruction manual. Wrong tightening may cause breakage of bolts whereupon the pipe connection at the pump will shear off.

NOTE The tightening torque is dependent on pump type.

6. Special recommendation concerning power plants

For ships there are certain standard safety rules concerning fuel systems and fire protection stipulated by classification societies and authorities, and therefore safety matters for ships will not be dealt with here. For power plants, however, the safety and fire protection rules vary. In addition to the rules stipulated by authorities, Wärtsilä NSD has found reasons to give the following recommendations:

6.1 Flexible hoses In some installations flexible hoses have been used as fuel line connections between engine and the fuel system in the engine room. In most of the installations elastic steel pipes, so-called omega pipes are used.

- Experiences of the flexible hoses have been excellent to the best of our knowledge and our investigations of used hoses show that they are in good condition after 1 – 2 years of service. But an ageing process will certainly take place.
- Visually inspect the flexible hoses after every 2000 running hours.
- Replace these hoses after max. two years of service.
- Use only correct type of hoses, i.e. in accordance with drawing 4V35A1329 or 4V35A1240 (hose length: 800 mm) or 4V35A1345 (hose length: 500 mm). The use of other hoses may be very hazardous.

7. Pipes for pressure gauges

- Do not use copper pipes.

8. Cleanliness

- Keep the engine and engine room clean.

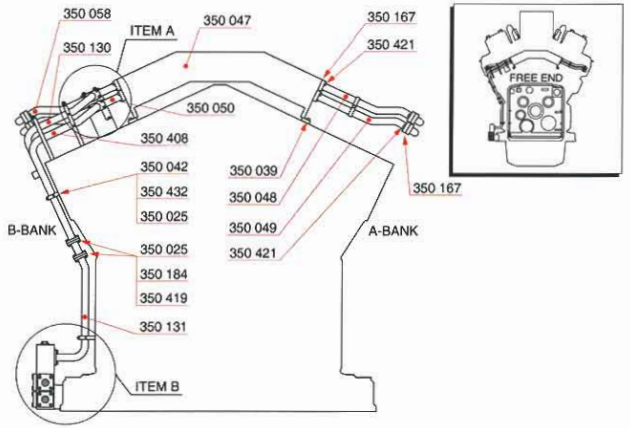
9. Emergency shut-off

- In case of fire it is most important that the fuel supply can be quickly and safely closed. Therefore, remotely controlled or automatically closing valves should be installed at strategic places in the fuel system.

10. Fire fighting training

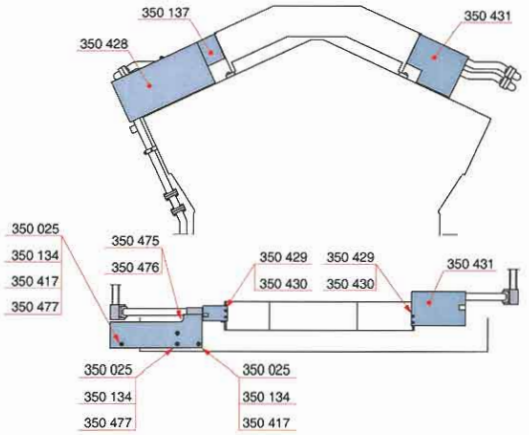
- Fire fighting training should be arranged regularly.

Fuel Lines in Free End V32



Part No and Description		Pcs	Kg
350 025	Nut	16	
350 039	Screw	4	
350 042	Bracket	2	
350 047	Pipe set	1	
350 048	Pipe, A-bank	1	
350 049	Pipe, A-bank	1	
350 050	Pipe, B-bank	1	
350 058	Pipe, B-bank	1	
350 130	Pipe	1	
350 131	Pipe	1	
350 167	O-ring	10	
350 184	O-ring	8	
350 408	Pipe	1	
350 419	Screw	8	
350 421	Screw	40	
350 432	Screw	2	

Fuel Lines in Free End V32



Part No and Description	Pcs	Kg
350 025 Nut	16	
350 134 Screw	4	
350 137 Cover	1	
350 417 Washer	12	
350 428 Cover	1	
350 429 Screw	10	
350 430 Washer	10	
350 431 Cover	1	
350 475 Screw	1	
350 476 Washer	1	
350 477 Screw **(1)**	3	

(1) Used only with alternative design

Annex 5

Circular No.19 /2002

REPUBLIC  **OF CYPRUS**

MINISTRY OF COMMUNICATIONS AND WORKS
DEPARTMENT OF MERCHANT SHIPPING
LEMESOS

Circular No.19 /2002

July 12, 2002

To all Owners
Managers, Representatives and Masters
of vessels flying the Cyprus flag.

Subject: Instructions to Recognised Organisations to enhance Flag State Control over Safety Standards of Cyprus Ships

I wish to inform you that the Department of Merchant Shipping, in cooperation with the Recognised by the Republic of Cyprus Classification Societies, in its effort to enhance the safety standards of Cyprus ships and to eliminate unnecessary and costly delays due to the detention of the ships by Port State Control Authorities, has decided to implement a new scheme of preventive control over Cyprus flag ships based on the experience gained so far.

The new scheme is as described in Appendix 1 and implementation is scheduled to commence on September 1, 2002. Every effort will be made to avoid repeated detentions and costly delays of ships.

All Owners, Managers and Masters of Cyprus flag vessels are requested to abide by the new procedures.

S. S. Serghiou
Director
Department of Merchant Shipping

Cc: Acting Permanent Secretary, Ministry of Communications and Works
Permanent Secretary, Ministry of Foreign Affairs
Maritime Offices of the Department of Merchant Shipping abroad
Diplomatic Missions and Honorary Consular Offices of the Republic
Recognised Classification Societies
Cyprus Shipping Council
Association of Cypriot Shipowners (Sea Rovers)
Union of Cypriot Shipowners
Cyprus Bar Association

Kyllinis Street, Mesa Geitonia, CY-4007 Lemesos, P.O.Box 56193, CY-3305 Lemesos, Telephone +357-25-848100
Telefax +357-25-848200, Telex 2004 MERSHIP CY, E-mail dms@cytanet.com.cy, Web page http://www.shipping.gov.cy

APPENDIX 1

INSTRUCTIONS OF THE DEPARTMENT OF MERCHANT SHIPPING OF CYPRUS TO ITS RECOGNISED ORGANIZATIONS

The present instructions aim at enhancing the control of the flag state over safety standards of Cyprus ships. These are additional to any authorization or instruction given in the past to Recognized Organizations. All terms used are as defined in international conventions for the implementation of which relevant authorizations have been given to Recognized Organizations.

1. Change of Flag Surveys

1.1 It is noted that regardless of whether the Company remains the same as before or a change occurs, no vessel may be registered with any outstanding recommendation, in accordance with the Department of Merchant Shipping circular 20/2001. In case a deviation from this policy is requested, it should be invariably referred to this Department for consideration and relevant instructions.

1.2 In both cases, at the time of the change of flag, if the due dates for the surveys for existing certificates are within the ±3 months´ window, then renewal/intermediate/periodical/annual surveys, as the case may be, shall be carried out immediately. At the same time, an inspection of basic ILO items as indicated in the check sheet in Annex 1, shall be carried out.

1.3 In the case where the change of flag is not accompanied by a change of the Company, the surveys shall be limited in scope to the extent of the applicable annual survey with the addition of basic ILO items, unless the due dates of the statutory surveys are within the window mentioned above.

1.4 In cases where the change of flag is accompanied by a change of the Company, the extent of the surveys in respect of safety equipment shall be upgraded to that of a renewal survey with the addition of basic ILO items. The surveys for the statutory certificates other than the safety equipment, unless they fall within the windows mentioned in paragraph 1.2 above, shall be carried out to the extent of annual surveys.

1.5 The statutory survey reports for the change of flag surveys shall be made available the soonest possible to the Department of Merchant Shipping either in hard copy or by e-mail, or through access to the society's data base.

Annex 6

Report of Inspection from SIReNaC database

Paris MOU
On Port State Control

FORM B/1

REPORT OF INSPECTION IN ACCORDANCE WITH THE PARIS MEMORANDUM OF UNDERSTANDING ON PORT STATE CONTROL *)

Dirección General de la Marina Mercante
Ruiz de Alarcón, 1
28071 Madrid
34 91 5979258
34 91 5979003

copy to : master
head office
PSCO
if ship is detained, copy to :
flag state
recognized organization, if applicable

1. name of ship	THE CALYPSO	**2. Imo number**	6715372
3. Date of final report	27-04-2006	**4. Place of inspection**	Sevilla

DEFICIENCIES FOUND AND FOLLOW UP ACTIONS ***)

Group deficiencies	Ship's certificates and documents
Defective item 1)	Passenger ship safety (including exemption) - Incomplete -
Convention reference 2)	
Action taken	Not detainable, As in the agreed class condition
Additionnal comments	NUMBER AND POSITION OF RESCUE BOAT, INMERSION SUITS MUST BE RECORDED. IIFERAFT DOESN´T RECORDED CORRECTLY.
Group deficiencies	Ship's certificates and documents
Defective item 1)	Prevention of pollution by oil (IOPP) - Not properly filled -
Convention reference 2)	
Action taken	Not detainable, As in the agreed class condition
Additionnal comments	RECORD OF EQUIPMENT ENTRY 4.1. INCORRECT.
Group deficiencies	Ship's certificates and documents
Defective item 1)	Other (certificates) - Other -
Convention reference 2)	
Action taken	Not detainable, As in the agreed class condition
Additionnal comments	LAST LIGHTWEIGHT SURVEY (26/04/05) IS NOT ENDORSED BY CLASS OR FLAG.
Group deficiencies	Safety of navigation
Defective item 1)	Nautical publications - Not up to date -
Convention reference 2)	
Action taken	Not detainable, At the next port
Additionnal comments	IAMSAR VOL. 3.
Group deficiencies	Safety of navigation
Defective item 1)	Magnetic compass - Missing -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	COMPASS ERROR NOT TAKEN.

***) Masters, Shipowners and/or Operators are advised that detailed information on the inspection may be subject to publication (www.parismou.org)

1) This inspection was not a full survey and deficiencies listed may not be exhaustive. In the event of a detention, it is recommanded that a full survey is carried o and all deficiencies are rectified before an application for re-inspection is made.

2) To be completed in event of a detention (for non-convention ships <500 GT for reference only)

Group deficiencies	Safety of navigation
Defective item 1)	Automatic identification system (AIS) - Missing -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	BRIDGE EUIPMENT CHECK LIST D.D. NOT INCLUDED A.I.S.
Group deficiencies	Accident prevention (ILO147)
Defective item 1)	Warning notices - Missing -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	IMO SYMBOL FOR HIGH VOLTAGE MUST BE FITTED ON TRANSMITTING ANTENNAS.
Group deficiencies	Radiocommunications
Defective item 1)	Reserve source of energy - Not as required -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	GMDSS EMERGENCY BATTERIES NOT HOLDING CHARGE. BATT. ROOM NOT ARRANGED.
Group deficiencies	Propulsion & aux.
Defective item 1)	Cleanliness of engine room - Insufficient -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	LOOSE ITEMS TOP BE REMOVED. TANKS TOP TO BE CLEANED.
Group deficiencies	Structural safety
Defective item 1)	Means of escape - Not as required -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	EMERGENCY EXITS HELD OPEN.
Group deficiencies	Structural safety
Defective item 1)	Beams, frames, floors-op.damage - Not as required -
Convention reference 2)	
Action taken	Not detainable, Within 14 days
Additionnal comments	LOOSE FLOOR PLATES IN ENGINE ROOM TO BE SECURED.
Group deficiencies	Structural safety
Defective item 1)	Signs, indications - Not as required -
Convention reference 2)	
Action taken	Not detainable, Within 14 days
Additionnal comments	EMERGENCY SIGNAGE IN ENGINE ROOM TO BE IMPROVED.
Group deficiencies	Fire safety measures
Defective item 1)	Fixed fire extinguishing installation - Not as required -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	SPRINKLER HEADS DIRTY OUTSIDE GALLEY.

***) Masters, Shipowners and/or Operators are advised that detailed information on the inspection may be subject to publication (www.parismou.org)

1) This inspection was not a full survey and deficiencies listed may not be exhaustive. In the event of a detention, it is recommanded that a full survey is carried and all deficiencies are rectified before an application for re-inspection is made.

2) To be completed in event of a detention.(for non-convention ships <500 GT for reference only)

Group deficiencies	Structural safety
Defective item 1)	Low level lighting in corridors - Not properly mantained -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	COVERED BY PAINT OUTSIDE GALLEY.
Group deficiencies	Fire safety measures
Defective item 1)	Fire prevention structure - Inadequate -
Convention reference 2)	
Action taken	Not detainable, Within 14 days
Additionnal comments	MANY FIRE DOORS PARTICULARLY NRS. 107,113,116,141,144,147 ARE NOT EFFECT AND TO BE RECTIFIED.
Group deficiencies	Accommodation
Defective item 1)	Access/structure - Unsafe -
Convention reference 2)	
Action taken	Not detainable, Before departure
Additionnal comments	REFRIGERATOR GAS STORED IN CREW ACCOMODATION AND ALSO BLOCKING ESCAPE ROUTE SIGNAGE.
Group deficiencies	Structural safety
Defective item 1)	Signs, indications - Damaged -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	ESCAPE SIGNS DAMAGED/MISSING IN STAIRWAY OF CREW AREA (LLL).
Group deficiencies	Structural safety
Defective item 1)	Means of escape - Blocked -
Convention reference 2)	
Action taken	Not detainable, Before departure
Additionnal comments	AREA CLOSE TO CREW GALLEY EMERGENCY ESCAPE.
Group deficiencies	Food and catering
Defective item 1)	Cleanliness - Dirty -
Convention reference 2)	
Action taken	Not detainable, Before departure
Additionnal comments	MAIN GALLEY DIRTY AND UNHIGIENIC.
Group deficiencies	Fire safety measures
Defective item 1)	Other (fire safety) - Other -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	LAUDRY ROOM TOO MUCH MATERIAL INSIDE MAKING MAJOR FIRE HAZARD.
Group deficiencies	Accommodation
Defective item 1)	Medical equipment - Not as required -
Convention reference 2)	
Action taken	Not detainable, Rectified

***) Masters, Shipowners and/or Operators are advised that detailed information on the inspection may be subject to publication (www.parismou.org)

1) This inspection was not a full survey and deficiencies listed may not be exhaustive. In the event of a detention, it is recommanded that a full survey is carried o and all deficiencies are rectified before an application for re-inspection is made.

2) To be completed in event of a detention.(for non-convention ships <500 GT for reference only)

Additionnal comments	GALLEY FIRTS AIDS KITS NOT ACCEPTABLE.
Group deficiencies	Accident prevention (ILO147)
Defective item 1)	Structural features (ship) - Missing equipment -
Convention reference 2)	
Action taken	Not detainable, Before departure
Additionnal comments	NO ESCAPE KEY IN GALLEY ELEVATOR.
Group deficiencies	Structural safety
Defective item 1)	Signs, indications - Not as required -
Convention reference 2)	
Action taken	Not detainable, Within 14 days
Additionnal comments	PASSENGER AND CREW ACCOMODATION SIGNAGE NOT ADEQUATE.
Group deficiencies	Operational deficiencies
Defective item 1)	Evaluation of crew performance - Lack of training -
Convention reference 2)	
Action taken	Not detainable, Within 14 days
Additionnal comments	CREW FIRE FIGHTING TRAINING REQUIRED.
Group deficiencies	Alarm signals
Defective item 1)	Inert gas alarm - Inadequate -
Convention reference 2)	
Action taken	Not detainable, Before departure
Additionnal comments	CO2 RELEASE BOX DOES NOT SOUND CO2 ALARM IN ENGINE ROOM.
Group deficiencies	Fire safety measures
Defective item 1)	Means of control (opening,pumps) Machinery spaces - Not as required -
Convention reference 2)	
Action taken	Not detainable, Within 14 days
Additionnal comments	REMOTE CLOSING DEVICES FOR FUEL VALVES NOT ACCEPTABLE.
Group deficiencies	Propulsion & aux.
Defective item 1)	Other (machinery) - Other -
Convention reference 2)	
Action taken	Not detainable, Within 14 days
Additionnal comments	EMERGENCY STEERING INSTRUCTIONS TO BE UPDATED.
Group deficiencies	Propulsion & aux.
Defective item 1)	Other (machinery) - Other -
Convention reference 2)	
Action taken	Not detainable, Within 14 days
Additionnal comments	STERN TRUSTER PANEL OIL LEAKAGE.
Group deficiencies	MARPOL annex I
Defective item 1)	Susp.of disch.violation - Not as required -
Convention reference 2)	

***) Masters, Shipowners and/or Operators are advised that detailed information on the inspection may be subject to publication (www parismou.org)

1) This inspection was not a full survey and deficiencies listed may not be exhaustive. In the event of a detention, it is recommanded that a full survey is carried o and all deficiencies are rectified before an application for re-inspection is made.

2) To be completed in event of a detention.(for non-convention ships <500 GT for reference only)

Action taken	Not detainable, Master instructed to ...
Additionnal comments	SOURCE OF SU'SPECTED OIL LEAKAGE FROM PROPELLER TO BE IDENTIFIED AND RECTIFIED. CLASS ALSO INSTRUCTED.
Group deficiencies	Structural safety
Defective item 1)	Electric equipment in general - Unsafe -
Convention reference 2)	
Action taken	Not detainable, Rectified
Additionnal comments	EMERGENCY GENERATOR ROOM:WIRE CLOSING BULKHEADS NOT WATERTIGHT.- ONE HOLE ON BULJEADS CLOSE TO DOOR;COMPRESSOR EXHAUST PIPE IS NOT PROTECTED; ONE PROTECTION PANEL BEHIND SWITHBOARD MISSING.

Name (duly authorized PSCO of reporting authority) Fernando Ales

Signature

***) Masters, Shipowners and/or Operators are advised that detailed information on the inspection may be subject to publication (www.parismou.org)

1) This inspection was not a full survey and deficiencies listed may not be exhaustive. In the event of a detention, it is recommanded that a full survey is carried o and all deficiencies are rectified before an application for re-inspection is made.

2) To be completed in event of a detention.(for non-convention ships <500 GT for reference only)

Annex 7

MCA Report of Inspection

Maritime and Coastguard Agency

REPORT OF INSPECTION* ~~AND/OR SURVEY~~*

Of *~~United Kingdom~~ /
*~~Dependent Territory~~ / *Foreign Vessel

(*delete as appropriate)

Master's Copy

2. Name of Ship: THE CALYPSO	6. IMO No: or Call Sign or Official no: 6775372
9. Date of Inspection/Survey: 26/4/06	10. Place of Inspection/Survey: SEVILLE, SPAIN

15. Nature of Deficiency

No:	15. (a) Code	I/S[1]	(b) Description of Deficiency	(c) Regulation references	16. Action Code[2]
1	0112	I	PASSENGER CERT. FORM P. DOES NOT RECORD RESCUE BOATS, IMMERSION SUITS LIFERAFTS CORRECTLY		00
2	0930	I	LAST LIGHTWEIGHT SURVEY (26/4/05) IS NOT ENDORSED BY CLASS OR FLAG		00
3	0150	I	ROLL RECORD OF EQUIPMENT, ENTRY 4.1 INCORRECT.		00
4	1677	I	GMDSS BATTERIES NOT HOLDING CHARGE		00
5	0199	I	PUBLICATIONS: IAMSAR VOL 3 OOD		00
6	1543	I	COMPASS ERRORS NOT TAKEN		00
7	2535	I	BRIDGE EQUIPMENT CHECK LIST DID NOT INCLUDE AIS		00
8	1420	I	E/ROOM DIRTY. LOOSE ITEMS TO BE REMOVED, TANK TOPS TO BE CLEANED		00
9	0714	I	EM. EXITS HELD OPEN		00

Remarks INSPECTION CARRIED OUT AT OWNER'S REQUEST IN CONJUNCTION WITH A MANDATORY EXPANDED PORT STATE INSPECTION CONDUCTED BY THE SPANISH P.S.C. INSPECTORATE. OWNER ADVISED THAT IF VESSEL ARRIVES IN U.K. IN CURRENT CONDITION IT MAY BE SUBJECT TO DETENTION.

MCA Office Address

UK COASTGUARD AGENCY MCA Office Stamp Dover Marine Office

Name (duly authorised surveyor or issuing authority)

Signature

Telephone +44 (0)

Fax +44 (0)

email mcga.gov.uk

REPORT TO SURVEYOR - The Master, Skipper or Owner is requested to confirm in writing to the MCA Office as above by / / (date) that all / item Nos ..... of the outstanding requirements listed above have been met and to indicate where and when the vessel will be available for re-inspection/survey (to be deleted by surveyor if not required).

Office use only: Confirmation received on / / (date) Signature .....

1 Please prefix inspection deficiencies with 'I' and survey deficiencies with 'S'
2 For codes see reverse of copy

Annex 8

Fleet Circular

MACHINERY SPACE FIRES, INFORMATION ON CARBON DIOXIDE, SAFETY PRECAUTIONS		
CIRCULAR NO: 003	ISSUE DATE: 04/07/2006	Page 1 of 7
PREPARED BY: SAFETY SUPERINTENDENT	REVIEWED BY: SQUAD	APPROVED BY: DPA

To: ALL LOUIS CRUISES VESSELS

Cc: CEO
DEPARTMENT HEADS

Machinery Space Fires & Fixed CO_2 Fire-Extinguishing Systems

Following a recent serious engine room fire, all vessels' technical staff are reminded of the actions to be taken upon discovery of a fire in a machinery space and the precautions to be taken in regard to fixed CO_2 extinguishing systems.

Initial Actions Upon Discovery

Any person discovering a fire in a machinery space must first raise the alarm. Either activate a manual fire alarm or tell someone else there is a fire (for example the Engineering officer on watch) so that they can inform the bridge and other engineering staff and put the ship's emergency procedures into action. **There will be no assistance until others know there is a problem.**

By taking immediate action it may be possible to extinguish a small fire in a machinery space using portable fire extinguishers or water and foam handlines. All engineering staff should be thoroughly familiar with the location and operation of hand fire fighting appliances within the machinery spaces.

If the fire is being fed by a fuel source (for example from a ruptured fuel oil line), immediate steps should be taken to stop the fuel supply – stop the affected machinery, stop fuel pumps, lub oil pumps, booster pumps etc and if possible isolate fuel supply lines.

Fixed Water-based Local Application Fire-Extinguishing Systems

Consideration should also be given to the manual activation of any Fixed Water-based Local Application Fire-Extinguishing System fitted in the fire affected area. If activated early enough, such systems may avoid the need for machinery to be shut down, for personnel evacuation or for sealing of the machinery spaces.

The remote release panel for Fixed Local Application Fire-Extinguishing systems will be mounted outside category "A" machinery spaces, normally within the Engine Control Room which is regarded to be outside of this space. In addition to this there may also be a local release box mounted at a safe and easily accessible location away from the protected area but inside the category "A" machinery space. All Engine Officers and Engine Watch Keeping staff are to be trained and familiar with the operation of the specific system(s) installed in their ship.

Areas protected and covered by Fixed Local Application Fire-Extinguishing Systems may typically be as follows:

- Internal combustion machinery used for the ship's main propulsion and power

generation
- Boiler fronts
- The fire hazard portions of incinerators
- Purifiers for heated fuel oil

Assessment of the Fire and Secondary Actions

If remedial extinguishing actions are not possible or successful due to the size of the fire, the heat being generated or due to the atmosphere inside the affected machinery space, all personnel should be withdrawn from the space and a rapid assessment made of the situation by the on-scene senior officers (Staff Captain, Chief Engineer and Safety Officer) in consultation with the Master. All fire parties should have mustered following the Code Bravo signal.

It is speed of response which usually determines whether a machinery space fire can be successfully controlled. The longer a fire continues, the more heat will be generated and the greater the chance that the fire will spread out of control and eventually out of the machinery spaces.

If a machinery space fire cannot be dealt with by remedial action at the outset, in most cases release of the ship's Fixed CO_2 Fire-Extinguishing System will be the most effective and safest means of controlling and extinguishing it.

The only other option (absent external assistance) is for re-entry to the machinery spaces by one or more of the ship's fire parties with full breathing apparatus sets, firemen's suits and hoses. That takes time to organise and puts the fire fighters at risk.

If it is decided to undertake a re-entry of the machinery spaces with the fire parties, careful consideration needs to be given to the location of the fire and from which point to enter the machinery spaces. Generally entry should be at the lowest possible level and if possible below the seat of the fire. Engine room supply ventilation should normally be stopped so as not to feed the fire with oxygen, but careful consideration of ventilation exhaust and control of openings (water tight doors, fire doors and ventilation dampers) can improve conditions/visibility for fire fighting without significantly feeding the fire with oxygen.

It is the Master's decision, taking account of the advice of his senior officers, whether to undertake a re-entry of the machinery spaces by the fire parties or to use the Fixed CO_2 System. He will have to take into account all relevant circumstances which will include:

1. Are there any other options? - for example shore assistance if in port;

2. How confident are the on-scene senior officers and Master that full fire party entry will succeed?

3. What are the risks to fire party personnel of re-entry?

4. What will be the likely time delay and consequences if a re-entry fails? As a general

rule, the longer the time delay before CO_2 is released, the less chance there will be of ultimately controlling and extinguishing the fire;

5. Is it confirmed that all personnel have been evacuated from the machinery spaces? If persons remain unaccounted for, machinery space re-entry may be necessary anyway in order to conduct a search;

6. What services/capabilities would be lost by the use of the Fixed CO_2 system and would that be acceptable in the circumstances? – for example, if main electrical supply and propulsion would be lost, how would that affect the navigational situation?

Fixed CO_2 Fire-Extinguishing Systems

All CO_2 systems are different, and all ships have detailed instructions for operation of their particular CO_2 systems, including the need to ensure a space is evacuated and properly closed down (ventilation stopped, watertight and fire doors closed, fire dampers and funnel flaps closed etc). This Circular is not intended to replace or in any way amend those instructions, but to highlight potential problems that can occur and safety precautions to be exercised in the use of the system and when conducting inspections or tests of the system.

The fixed CO_2 fire-extinguishing systems fitted on Louis Cruises vessels are high pressure systems that consist typically of a CO_2 room containing banks of CO_2 cylinders connected to a common manifold. The manifold connects to the discharge piping and nozzles in the protected spaces. Each system requires at least two separate manual actions to discharge CO_2 into a protected space.

A system typically requires one or more pilot cylinder valves to be opened first (which provides the 'operating' gas to activate the system). Pilot cylinders may be located at remote operating stations and/or be one or more of the main CO_2 cylinders in the CO_2 room. Operation of pilot cylinder valves may be by a lever system or manual operation of a cylinder valve.

Either directly, or in some systems by activation of a separate control or lever, pressure from the pilot cylinder(s) operates the valves of the other CO_2 cylinders and causes them to discharge into the manifold.

The manifold holds the CO_2 until it is released by a separate control which causes the opening of the distribution valve. This permits the CO_2 to enter the discharge piping leading to the protected space.

All systems have alarms incorporated to ensure the alarm sounds in any protected space upon activation of the system.

A time delay is also built into fixed CO_2 systems, to ensure that the alarm will sound for a minimum period before CO_2 is actually released into the space. This is to give persons in the space time to get out.

The time delay is in most systems controlled by a pneumatic cylinder. Once the CO_2 is released into the manifold and the control for the distribution valve operated, the pneumatic cylinder will gradually fill with CO_2. When the pressure in the cylinder reaches a set level, it will activate the distribution valve.

Many fixed CO_2 fire-fighting installations provide protection to more than one space. The amount of CO_2 available for discharge usually has to be sufficient to fill at least 35% of the volume of the largest space protected - typically the engine room, with 85% of the required volume of CO_2 gas being delivered to the protected space within 2 minutes of release. To extinguish a fire in the largest space, all the CO_2 cylinders would normally have to be released. It is therefore designed as a 'one-shot' system with no second chance.

On systems where more than one space is protected, separate discharge valves (with their own separate release controls and time delay cylinders) will be installed on the manifold to allow CO_2 to go to the right space. Different pilot bottles may have to be opened for releasing into different spaces and different spaces may require different numbers of CO_2 cylinders to be discharged to give the correct CO_2 volume. Most systems will automatically discharge the correct number of cylinders for a particular space if the operating instructions are followed. If the fire is in a space other than the largest space, any cylinders not used in the initial discharge may be available for a subsequent 'top-up' if required.

Safety Considerations Concerning Fixed CO_2 Fire-Extinguishing systems

1. All ship's personnel involved or likely to be involved in the operation, maintenance, testing or inspection of a ship's fixed CO2 fire-fighting system must be fully trained and familiar with the ship's particular system, its manner of operation and operating instructions, this Circular and all relevant parts of the ship's Safety Management System. Verification of Crew's competence in the use of these systems by the Captain or other Senior Officers or Company's Auditors attending the ship should be documented using form F-SQA-709 already forwarded to all ships and attached again for ease of reference.

2. Whenever a machinery space fire is the subject of onboard fire drills, training and familiarisation with the operation and associated procedures for CO_2 release should be included, specifically for those persons likely to have to operate the system in a real fire situation. Training should include normal release procedures from local and remote operating stations, as well as emergency release procedures (for example, manual release of cylinder release mechanism or even individual cylinders, and manual opening of distribution valves).

3. Only a person fully trained and familiar with the operation of a ship's fixed CO_2 fire-extinguishing system should activate the system.

4. Instructions for operation of the system should be set out at each CO_2 system control station and should be clear and unambiguous.

5. The system should only be operated in accordance with the operating instructions.

6. Care must be exercised to ensure CO_2 is only released into the space(s) where it is needed. Remember, this is a 'one-shot' system with only sufficient CO_2 to achieve the required concentration in the largest space. If that is the engine room and that is where the fire is, releasing the CO_2 additionally into other covered spaces (for example the boiler room, workshop or generator room) may result in insufficient CO_2 concentration in the engine room to extinguish the fire. Flooding all spaces with CO_2 to 'be on the safe side' should therefore be avoided.

7. **Due to the possibility of accidental release into other covered spaces, all spaces covered by the system should be confirmed as evacuated prior to any release.**

8. All parts of the system referred to in the operating instructions should be clearly and obviously labelled, marked, painted or in some other way identifiable such that there can be no doubt what is being referred to. For example, if it is required to manually open pilot cylinder valves within the CO_2 room and the pilot cylinders form part of the main CO_2 cylinder bank, the particular cylinder(s) must be clearly identifiable. Where different spaces are covered by the system, it may be necessary to identify which pilot cylinder(s) have to be operated for each of the spaces covered.

9. Likewise, careful consideration should be given to the positioning, labelling, marking or other means of positively avoiding confusion with something that might be mistaken for something referred to in the operating instructions. For example, pneumatic time-delay cylinders could be mistaken for pilot cylinders.

10. Pneumatic time delay cylinders are usually fitted with manual valves which when opened by-pass the time-delay causing the distribution valve to open immediately upon activation of the system. Only in extreme cases should the time-delay be by-passed.

11. As soon as practically possible after activation of the CO_2 system, whether remotely or locally, a thorough check of the system in the CO_2 room (subject to their being a safe atmosphere in the CO_2 room) should be made to ensure that all the cylinders intended to be released have in fact been released. In many cases individual CO_2 cylinders have some means of identifying whether they have discharged or not, but this is not always the case.

12. Before any access is made by personnel without breathing apparatus into a space in which CO_2 has been released (see below in relation to the general precautions concerning access), or indeed any other space covered by the CO_2 system, **positive steps must be taken to ensure the CO_2 system is safe** and cannot be further accidentally released into any covered space. It should be assumed that one or more CO_2 cylinders did not discharge. No access to covered spaces should be made until both the Chief Engineer and Safety Officer are satisfied the system is safe.

13. How a system is made safe will depend upon the particular system – this might include: resetting the control system levers; putting the safety pins into the CO_2 cylinder valves; ensuring distribution and operating valves are manually closed/locked; disconnecting the automatic cylinder release mechanism; and/or even blanking off the main distribution lines. Access to the CO_2 room and remote control stations should be strictly controlled.

14. At the first available opportunity following a CO_2 release, a professional service company and/or system manufacturer's representative is to attend on board to first confirm the system is safe and then restore it to operational readiness.

Actions Following Release of CO_2

CO_2 operates to suffocate a fire by reducing the amount of oxygen in the space. It can reduce and extinguish a fire very quickly; however it has very little cooling effect. As there may be local "hot" spots in the space, which could cause the fire to re-ignite when exposed to oxygen, **the space should be kept tightly closed until it is absolutely certain that sufficient cooling has occurred to avoid re-ignition. Any opening of access doors to check the status of the fire risks re-ignition.**

Following release of CO_2 all spaces adjacent to the affected space should be frequently checked or preferably continuously monitored so as to prevent spreading of the fire by for example overheating of bulkheads. If necessary boundary cooling should be undertaken.

It is not possible to say what time period should be allowed before a check is made inside the space. This will depend upon the duration and extent of the fire before release of CO_2, the extent of residual heat inside the space and the results of external monitoring of the space. If external temperatures are coming down, this is obviously a good sign. If external temperatures continue to go up, it may be that the CO_2 has failed and re-entry to the space with fire parties may be the only remaining option.

Initial re-entry into the space for inspection purposes should involve minimum numbers but always accompanied in case one gets into difficulty – ideally 2 persons. They should each have on full self contained breathing apparatus (SCBA) sets and lifelines, if not full fireman's suits. The means of access should be opened for the minimum time possible during entry and exit of the space.

Once it has been confirmed that the fire has been extinguished and there is no risk of re-ignition, the space, adjoining spaces and other spaces covered by the CO_2 system must be thoroughly vented. Normal oxygen content in air is about 20.9% and CO_2 content in air about 0.03%. Due to the effects of reduced oxygen content and/or increased CO_2 content, it is dangerous to enter any space before it has been confirmed that near normal oxygen and CO_2 levels have been restored. Entry without SCBA should not be permitted if oxygen content is below 20% and CO_2 content is above 2%.

The atmosphere should be tested throughout the affected spaces and adjoining spaces

(particularly lower areas as CO_2 is heavier than oxygen). Spaces should be checked by oxygen and CO_2 meters. Ventilation should continue after access.

If there is any reason to believe that persons have been trapped by the fire or the release of CO_2, a rescue party must be organized immediately. The party must be equipped with SCBA (not ordinary smoke masks) and the victims, if unconscious, must be given artificial respiration as soon as they have been brought out.

An engine room fire will always involve a high risk to the safety of the ship especially a passenger ship and to the persons onboard. It is therefore essential that the above procedure is followed promptly and any fire properly extinguished.

Attached is additional information of CO2 and Safety Precautions.

1. Carbon Dioxide & Safety Precautions
2. Carbon Dioxide Fire Extinguishing System Safety – USCG Navigation and Vessel Inspection Circular No. 9-00, dated March 17, 2000.
3. Carbon Dioxide as a Fire Suppressant: Examining the Risks – United States Environmental Protection Agency (EPA), dated February 2000.

Entry Permit in a Space where CO2 has been Discharged

Attached please also find a safety checklist prepared namely "Entry Permit in a Space where CO_2 has been Discharged" which is to be followed in case of an actual release of CO_2 by this checklist can also be used in a simulated CO_2 drill.

Safety Superintendent (CSO)

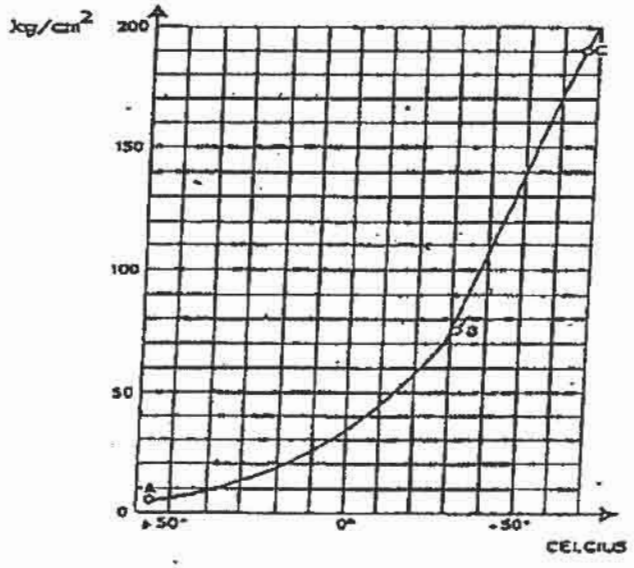
CARBON DIOXIDE & SAFETY PRECAUTIONS

The chemical formula of carbon dioxide – a compound of carbon and oxygen – is CO2. It should not be mistaken for the poisonous compound of the same two elements, carbon monoxide – CO.

Carbon dioxide does not support combustion, and as it is about 50% heavier than air it will - when used as an extinguishing agent form a blanket over the fire and extinguish it. At normal pressures and temperatures, carbon dioxide is a colourless gas with a faintly astringent smell, which makes the bystander cough.

Carbon dioxide is a non-conductor of electricity. This is important in engine rooms, as it means that extinguishing with carbon dioxide will not damage electrical installations such as generators, motors and switch boards. Further as carbon dioxide is chemically neutral and thus has no corrosive effect on any material, engines and other equipment may be run as usual after a thorough airing.

1 kilo of carbon dioxide will develop about 0.56 cbm of gas, capable of extinguishing fires in concentrations of 30% and more. By compression, carbon dioxide is made into a liquid, which is stored in steel cylinders. The ration of the litre content of the cylinders to the quantity of carbon dioxide in kilogrammes is called the filling ratio and it is normally 0.67 kilos per litre. This is defined as the "tropical filling" ratio; and at a temperature of 21°C it will give a cylinder pressure of 58 kp/cm. With the same filling ratio at about 28°C the cylinder will be completely filled with liquid carbon dioxide and a further small increase of temperature will cause a large increase of pressure. As may be seen form the diagram, the pressure will rise to 190 kp/cm2 at a temperature of 66°C, causing the safety disc of the cylinder valve to fracture



Consequently the CO2 cylinders are stored in a separate room which should be kept well ventilated, and for safety reasons, the temperature in the room should never exceed 40°C. If there is reason to believe that the temperature has exceeded this safety limit, it should be checked immediately that the green covering plate of the safety discs of the CO2 cylinder valves are intact.

Large quantities of liquid carbon dioxide are often stored at low temperatures in insulated steel tanks with their own refrigerating units. The temperature in the tank is about -18 °C and the pressure about 21 atm.

The effects on human health of various CO2 concentrations are indicated in the tables below.

Acute Health Effects of High Concentrations of Carbon Dioxide Carbon Dioxide Concentration

CARBON DIOXIDE & SAFETY PRECAUTIONS

Carbon Dioxide Concentration (Percent)	Time	Effects
17 - 30	Within 1 minute	Loss of controlled and purposeful activity, unconsciousness, convulsions, coma, death
>10 – 15	1 minute to several minutes	Dizziness, drowsiness, severe muscle twitching, unconsciousness
7 – 10	Few minutes 1.5 minutes to 1 hour	Unconsciousness, near unconsciousness Headache, increased heart rate, shortness of breath, dizziness, sweating, rapid breathing
6	1 – 2 minutes ≤16 minutes Several hours	Hearing and visual disturbances Headache, dyspnea Tremors
4 – 5	Within a few minutes	Headache, dizziness, increased blood pressure, uncomfortable dyspnea
3	1 hour	Mild headache, sweating, and dyspnea at rest
2	Several hours	Headache, dyspnea upon mild exertion

Physiological Tolerance Time for Various Carbon Dioxide Concentrations

Concentration of Carbon Dioxide in Air (percent by Volume)	Maximum Exposure Limit (Minutes)
0.5	*Indefinite*
1.0	*indefinite*
1.5	*480*
2.0	*60*
3.0	*20*
4.0	*10*
5.0	*7*
6.0	*5*
7.0	*Less than 3*

Consequently carbon dioxide must not be discharged until everybody has left the space; any space in which carbon dioxide has been discharged must be thoroughly aired before anybody is sent into it without a smoke helmet.

The CO2 contents of the room can be checked by means of a special CO2 indicator. If the CO2 concentration is higher than 2% and oxygen concentration less than 20%, entry without SCBA should not be permitted.

It should be remembered that CO2 is heavier than air, and therefore the gas will hardly disappear completely from the space, and the concentration will be highest near the floor.

If it is suspected that the space has not been sufficiently aired then anybody entering the space must have a safety line. Masks with a smoke filter, for example an ordinary gas mask, do not protect against the effects of CO2.

Persons trapped by the carbon dioxide must immediately be carried out into fresh air. If persons are unconscious artificial respiration should be given immediately; they should not be given water or any other drinks.

Before a space is filled with carbon dioxide it must be properly closed and sealed. The space must be kept filled with carbon dioxide until it has been definitely established that the fire has been extinguished and heated materials or fixed equipment have been cooled down.

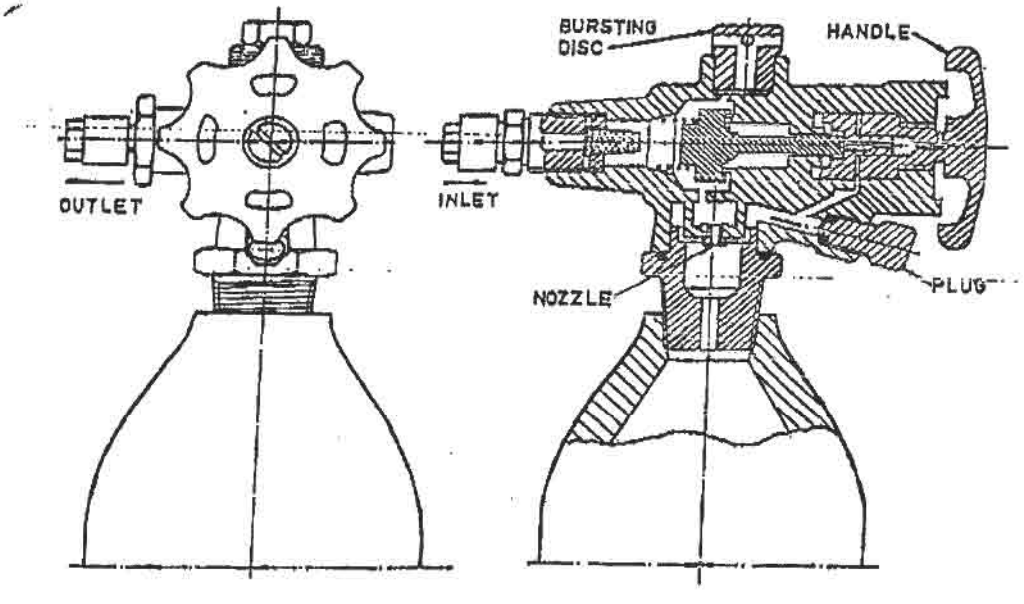
It must always be taken into consideration that the fire may break out again if fresh air is allowed into the space, i.e. when a door into that space is opened.

Fire in nitrates or chlorates cannot be extinguished by carbon dioxide due to the oxygen contained in these chemicals.

With "total flooding" of engine rooms a CO2 concentration of about 35% or more is obtained within 2 minutes, and as the CO2/air mixture will not be homogeneous, concentrations will probably be higher near the floor than at other levels. After carbon dioxide has been released to a space some 15-20 seconds will pass before the CO2 concentration becomes dangerous. As it is not possible to hold one's breath for more than about 30 seconds it will be necessary for the personnel to leave the space immediately when the alarm siren sounds.

Persons caught in the discharge of carbon dioxide should hold their breath as long as possible and immediately make upwards for the exits. The chance of being saved, if unconscious, is better on the upper flats as carbon dioxide is heavier than air.

TIME DELAY UNIT
PNEUMATIC TYPE 03-4413-11/21
TECHNICAL DESCRIPTION
(INSTALLED ON CERTAIN SHIPS)



The pneumatic time delay unit (timer) may be used for CO2 Extinguishing Systems on certain ships, where opening of main or distributing valve must not occur until after a certain period after alarm has sounded.

OPERATION

Upon opening of CO2 bottles the gas/liquid from the manifold is to be led through a control valve

and/or a 1/4" (6/8 mm) copper or steel pipe into the filter inlet of the time delay valve. The valve, which in stand-by position is closed with sealed handle, is screwed into a bottle. The bottle is pressurized through a calibrated nozzle in the time delay valve.

When the ratio between the inlet pressure and the pressure achieved in the bottle exceeds 1.66, the piston will open .the valve and allow the pressure from the manifold to activate the main or selector valve in question to open.

The time delay device can be fitted with a calibrated nozzle which gives a time delay between 20 and 30 secs. By changing the nozzle a time delay between 60 and 90 secs. can be obtained.
After use the time delay bottle should be vented either thought the inlet and the control valve or by dismounting the plug in the time delay valve.

Due to the cooling effect of CO2, especially when using it as liquid, the temperature of the time delay unit should return to the surrounding temperature before use or new test in order to achieve the wanted time delay.

Emergency Operations

If time delay valve fails to open or a shorter time delay is wanted the valve can be opened by breaking the seal and using the valve handle.

If liquid CO2 is trapped in the bottle a bursting disc will release when the pressure exceeds 190 bar.

NOTE: Operation to be supervised and directed by the Master

ITEM	DESCRIPTION	REMARKS
1.	Indicate space in which CO_2 has been released	
2.	Indicate date and time that CO_2 has been released	
3.	Indicate the time the Master ordered the initiation of procedures for entry. (As there may be local "hot" spots in the room which could case the fire to break out again when the room is aired, the room should be kept tightly closed until it is absolutely certain that sufficient cooling and therefore complete extinguishing has been achieved.)	
4.	Prepare E/R Fire Squad. Indicate the time that the Safety Officer/Chief Engineer reported that E/R Fire Squad is ready to enter the space (Breathing Apparatus Control Sheet to be kept by the Safety Officer.)	
5.	Indicate the time of order given by the Master for the E/R Fire Squad to enter the space.	
6.	Indicate the effect of CO_2 release Fire extinguished? YES / NO If NO, continue fire fighting If YES, proceed as follows	
7.	Indicate the time that E/R Fire Squad exited the space.	
8.	Start ventilation in the room. (When the fire has been extinguished the room must be thoroughly aired and inspected before it is used again. Time of ventilation depends on capacity of E/R fans and cubic capacity of Engine Room.) Indicate time that ventilation started	
9.	Indicate the time of 2nd entry of the E/R Fire Squad to check the room's atmosphere (ventilation is continued.)	
10.	Indicate method of checking rooms atmosphere CO2 indicator Oxygen meter	
11.	Indicate the time of 2nd exit of E/R Fire Squad	

12.	Indicate results of room's atmosphere test. Ventilation is still continued CO2 indicator (safe if less than 2%) Oxygen meter (safe if above 20%)	
13.	Atmosphere safe for entry? State. YES NO	
14.	If YES, allow as an extra safety margin sufficient ventilation to continue for extra 30 minutes.	
15.	If NO, allow ventilation to continue for sufficient time prior to repeating steps 9-14.	
16.	Before any access is made by personnel WITHOUT BREATHING APPARATUS into a space in which CO2 has been released, **or any other space covered by the CO2 system**, positive steps must be taken to ensure the CO2 system is safe and cannot be further accidentally released into any covered space. It should be assumed that one or more CO2 cylinders did not discharge. No access to covered spaces should be made until both the Chief Engineer and Safety Officer are satisfied the system is safe. How a system is made safe will depend upon the particular system – this might include: resetting the control system levers; putting the safety pins into the CO2 cylinder valves; ensuring distribution and operating valves are manually closed/locked; disconnecting the automatic cylinder release mechanism; and/or even blanking off the main distribution lines. Access to the CO2 room and remote control stations should be strictly controlled. Time CO_2 system checked and verified as "safe." Time permission was granted to enter the space without a SCBA.	

Date: _____

Master's Signature: _____

LOUIS CRUISES

F-SQA-709-01 COMPETENCY VERIFICATION IN THE OPERATION OF SAFETY / EMERGENCY SYSTEMS

SHIP: _____ **SYSTEM:** _____ **PAGE:** _____ **OF** _____

NO	NAME	POSITION	DATE	SIGNATURE	VERIFIER'S COMMENTS

The Verifier (Name) : _____ **Signature :** _____

Title : _____ **Date :** _____