### **Bahamas** Maritime Authority

# Marine Safety Investigation Report

into the failure of a condemned fire extinguisher during decommissioning resulting in the loss of a life on 06 June 2022



The Bahamas conducts marine safety or other investigations on ships flying the flag of the Commonwealth of the Bahamas in accordance with the obligations set forth in International Conventions to which The Bahamas is a Party. In accordance with the IMO Casualty Investigation Code, mandated by the International Convention for the Safety of Life at Sea (SOLAS) Regulation XI-1/6, investigations have the objective of preventing marine casualties and marine incidents in the future and do not seek to apportion blame or determine liability.

It should be noted that the Bahamas Merchant Shipping Act, Para 170 (2) requires officers of a ship involved in an accident to answer an Inspector's questions fully and truly. If the contents of a report were subsequently submitted as evidence in court proceedings relating to an accident this could offend the principle that a person cannot be required to give evidence against themselves. The Bahamas Maritime Authority makes this report available to any interested individuals, organizations, agencies or States on the strict understanding that it will not be used as evidence in any legal proceedings anywhere in the world. You must re-use it accurately and not in a misleading context. Any material used must contain the title of the source publication and where we have identified any third-party copyright material you will need to obtain permission from the copyright holders concerned.

Date of Issue: 27 June 2023 Bahamas Maritime Authority 120 Old Broad Street LONDON EC2N 1AR United Kingdom

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## 1. Summary

### What happened

The Bahamas flagged tanker Seacross was alongside in Talos, Greece, attending to several scheduled maintenance tasks.

During the late morning, officers from the deck department were preparing to dispose of several condemned fire extinguishers to garbage facilities ashore. Preparation of decommissioning the portable foam extinguishers involved removing the CO<sub>2</sub> charge cartridge.

Having successfully removed the cartridge from one extinguisher, the officers could not remove the valve assembly from the second. One took the decision to discharge the extinguisher into some waste rags. During discharge, the body of the extinguisher ruptured at the base and struck the officer in the chest. Despite immediate first aid from the crew, he died from his injuries.

#### Why it happened

The fire extinguisher failed following the release of carbon dioxide, when the handle was depressed, causing the base to rupture due to severe corrosion, propelling it upwards.

The officer deviated from the requirements of the safety management system, instructions given by the chief officer and failed to appreciate the dangers associated with condemned pressurised systems, or the safety measures to be considered when handling them.

#### What can we learn

Servicing by shoreside personnel may not be sufficient to control risks. Crew should inspect each extinguisher for signs of corrosion, and where concerns arise, then these are to be raised and discussed with the safety officer on board.

Pressure vessel failure can be catastrophic. Crew should be made aware of the potentially fatal risks associated with handling compromised pressure vessels and systems, and where possible, decommissioning and disposal of fire extinguishers should be conducted by suitably qualified contractors.

## 2. Factual Information

### Seacross

Vessel Type	Cri	ude Oil Tanker	Flag			Bahamas		
Owner	Na S.A	rcissus Enterprises A.	Manag	er		Thenamaris Ship Mana	gement Inc.	
Classification Society	An Sh	nerican Bureau of ipping (ABS)	Gross/I Tonnag	Net ge		84,601 / 53,710		
Built	20 of	06, Samho, Republic Korea	Propul	sion		B&W 6S70MC-C – 18630 single propeller	0kW 6 cylinder	
IMO No.		Callsign	Length	overa	п	Breadth	Moulded Depth	
9297890		C6UY2	274.	19m		50.0m	23.1m	
Last BMA Inspection				Last PSC Inspection				
Le Havre, France,	, 17	March 2021. No defici	encies	(	Cor	pus Christi, USA, 14 Fel deficiencies	oruary 2022. No	



Seacross – Mai	rine Safety Inve	stigation Rej	oort				
Crew Det	ails						
Rank/Role on board	Master	Duty Chief Officer	Second Officer A (deceased)	Second Officer B	Second Officer C	Relief Chief Officer	
Qualification	Master mariner	Master mariner	oow	oow	OOW	Chief Mate	
Certification Authority	Bulgaria	Bulgaria	Bulgaria	Bulgaria	Bulgaria	Bulgaria	
Nationality	Bulgarian	Bulgarian	Bulgarian	Bulgarian	Filipino	Bulgarian	
Age	54	34	28	25	31	32	
Time in rank	5 years 6 months	2 years 7 months	2 months	1year 6 months	3 years 3 months	6 months	
Time on board	25 days	3.5 months	2 months	2 months	6.5 months	9 days	

### **Crew Details**

### **Environmental Conditions**

Wind	Wind	Wave	Swell	Precipitation	Visibility	Light
Direction	Force	Height	Height	/ Sky	Range	Conditions
NE	3	0.1m	0.1m	Clear/ Blue	Good	Daylight

### Voyage details

At the time of the casualty, the vessel was alongside in Talos, Elefsina, Greece.

#### Narrative

All times in the report are UTC +2

On the 6 June 2022, the Bahamas flagged tanker M/T Seacross was alongside in Talos, Greece, carrying out installation and commissioning works to its Ballast Water System, as well as undertaking emergency engineering repairs. During this period of layover, a decision was taken to remove decommissioned items of equipment, including condemned fire extinguishers, that had been identified during planned maintenance inspections, for recycling ashore.

Prior to its voyage to Greece, the vessel had called in at Corpus Christi, in the United States of America, where a shore side service contractor attended the vessel and carried out the vessel's annual inspection and testing of all fixed and portable firefighting appliances and systems, before issuing the vessel with certificates of inspection (Appendix 1).

On its voyage to Greece, deck officers carrying out routine planned maintenance inspections observed that three of the recently inspected fire extinguishers were severely corroded. The extinguishers were declared condemned, removed from service and stored in the steering room in preparation for decommissioning and removal ashore.

At 08:00, the duty chief officer held a morning safety meeting, where on the agenda of items to be attended to, was for the deck officers to make a full sweep of the vessel and gather all condemned and decommissioned fire extinguishers and transfer them to the upper main deck aft, outside the garbage room. Whilst the vessel was in Talos, there would be a hive of activity on board with ballast water system commissioning, as well as repairs to the ships propellor shaft along with other routine tasks.

Following the meeting, three second officers (A, B & C) set about retrieving the extinguishers marked as "not in use" or condemned and transferring them to the garbage store. As part of the disposal operation the officers were instructed to deconstruct the foam extinguishers where possible and keep any parts which could be used as spares. Part of this, was the removal of the cap assembly (figure 1) in order to empty the foam solution and detach the CO<sub>2</sub> cartridge from inside, and then disposing of the empty cylinder and any unwanted components into the skip for recycling ashore. Instruction was given that should the extinguishers cap assembly not free itself then the extinguisher was to be placed to one side.



Figure 1. Diagram of extinguisher showing cap assembly

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During this time the duty chief officer was aft, overseeing positioning of the skips being landed by shore crane, whilst the relief chief officer was assisting with the commissioning of the ballast water system.

Once all the condemned extinguishers had been relocated to the garbage room adjacent to the CO<sub>2</sub> locker, second officers A and B commenced with deconstructing and disposal of the extinguishers, having assisted the bosun with recycling of extinguisher trolley parts, second officer C returned to the ship's bridge to attend to administrative duties.

At approximately 11:00, second officer A, managed to loosen the cap assembly from one of the foam extinguishers using a wrench, followed by removal of the CO<sub>2</sub> cartridge and emptying the cylinder of foam solution.

However, the cap assembly on the second foam extinguisher proved difficult to remove and after several attempts, so second officer A informed second officer B, that it was best to depress the lever, and empty the contents out over some waste rags in the garbage locker, before transferring to the skip (Figure 2).

At 11:25 second officer A aimed the nozzle into the locker and upon pressing the lever for the first time, some water and foam solution trickled out. When he pressed the trigger a second time the extinguisher ruptured at the base, propelling the extinguisher up and into his chest (Figure 3).



Figure 2. Position prior to depressing the extinguisher lever (reconstruction)

Second officer B, who was standing behind second officer A attending to another extinguisher, only became aware that something was wrong when he noticed that he was wet and covered in solution, and when looking up to see where it may have come from, observed second officer A stumbling backwards holding his chest. On observing second officer A starting to stumble, second officer B went

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to assist in lying him down on the deck, before asking him if he was okay, to which second officer A replied "No".

Second officer B immediately called out for help before trying to attend to second officer A and ascertain the extent of his injuries.

At 11:26, the duty chief officer who was aft attending to the skips and crane operations immediately arrived on the scene and called for assistance on the very high frequency (VHF) radio and summoned the master, superintendent and relief chief officer.

At 11:28 the chief officers started cardio pulmonary resuscitation and took it in turns with the other officers who were now present. Meanwhile, the master called the shipyard's emergency response and the superintendent called for an ambulance.



Figure 3. Impact area from extinguisher



Figure 4. Ruptured foam extinguisher

At 11:35 second officer B was requested to make their way to the ship's medical room to recover the Automatic External Defibrillator and on arriving at the scene a short while later, assisted the duty chief officer with connecting it to the injured second officer A.

During this time the ship yard's emergency room doctor in Eleusis had been called but was attending to an ongoing incident nearby. At 12:00 an ambulance arrived at the entrance to the main gate, and was directed to the vessel, whilst at the same time, representatives from the Hellenic Bureau for Marine Casualties Investigation arrived on board, followed by two local Hellenic Coast Guard inspectors who seized the ruptured fire extinguisher from the garbage locker (Figure 4).

At 12:10, the paramedics arrived onboard with the use of a shore crane lifting basket, assessed the injured second officer A, and advised that he be transferred ashore and taken to the nearest hospital.

Despite first aid efforts, second officer A died of his injuries.

#### **Previous similar cases**

#### Aquamarine Driller (2021)

A person was killed when there was a catastrophic explosive failure of a corroded fire extinguisher. The incident occurred when the person was discharging a corroded handheld cartridge-type, dry chemical powder fire extinguisher which had been condemned during an annual third party inspection. A marine safety investigation is ongoing by Panama but a summary can be found on the <u>IMCA website</u>

#### Emerald Princess (2017) TAIC

During routine maintenance inspection crew were restoring pressure to a bank of high-pressure nitrogen-gas cylinders that formed part of the launching davit 'stored energy' system. One of the nitrogen bottles burst, fatally injuring a crew member who was standing close by. The Transport Accident Investigation Commission (Commission) found that the nitrogen cylinder burst at below its normal working pressure because severe external corrosion had reduced the wall thickness to about 30% of its original thickness. A Bahamian vessel suffered a similar failure in 2020, <u>Safety Alert 20-03</u> refers.

#### Anonymous report (2019) CHIRP

Approximately one month after a survey and five-yearly overhaul of Life Saving Appliances, a fully charged air cylinder exploded just above the keel moulding of a lifeboat, causing considerable damage. Fortunately, no personnel were injured. Further inspection of the remaining cylinders showed material wastage through corrosion of approximately 50% of the cylinder walls' original thickness.

### Applicable industry guidance

IMO Resolution A.951(23) provides guidelines for marine portable fire extinguishers <u>wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/AssemblyDocuments/</u><u>A.951(23).pdf</u>

ISO 7165:2017 specifies the principal requirements intended to ensure the safety, reliability and performance of portable fire extinguishers <u>www.iso.org/standard/65987.html</u>

## 3. Analysis

The purpose of the analysis is to determine the contributory causes and circumstances of the casualty as a basis for making recommendations to prevent similar casualties occurring in the future.

Following the casualty, the failed fire extinguisher was seized by investigators from the Hellenic Coast Guard. Requests for access to conduct metallurgical and material analysis have been declined.

A second officer sustained fatal injuries when the condemned fire extinguisher he was operating failed due to corrosion at the base weld seam.

### Failed fire extinguisher

The extinguisher that failed was a 9 litre steel constructed foam extinguisher using a  $CO_2$  cartridge for propellant. In  $CO_2$  cartridge extinguishers, the extinguishing medium resides in the body of the extinguisher, with a siphon tube and a  $CO_2$  gas pressure charge (ranging from 12 to 220g in capacity) usually fixed to the head-cap assembly. When the trigger is depressed, gas is released from the  $CO_2$  cylinder, pressurising the extinguisher body.





#### Examples of 9 litre fire extinguishers in acceptable condition as per IMO Res. A.951(23)

The extinguisher was manufactured in Malaysia by Steel Recon Industries Limited in 2005 (Appendix 2) and supplied to the vessel as new when it entered service in 2006.

Since being part of the vessel's firefighting inventory it had been inspected and serviced in accordance with SOLAS Chapter II-2/14.2.2. and IMO Res. A.951(23), with monthly planned maintenance checks recorded onboard.

In Le Havre on 25 October 2014 the extinguisher underwent its ten year hydrostatic test (at eight years). Its most recent annual inspection by shoreside contractors was carried out by Cobalt Blue USA Inc. on 18 February 2022 at Corpus Christi in the United States of America.

Two weeks after its annual inspection by Cobalt Blue, it was condemned during planned maintenance inspections and removed from service.

AN	NUAL INSPECTION
Safety clip and indicating devices	Check to see if the extinguisher may have been operated.
Pressure indicating device	Where fitted, check to see that the pressure is within limits.
	Check that dust covers on pressure indicating devices and
	relief valves are in place.
External examination	Inspect for corrosion, dents or damage which may affect the
	safe operation of the extinguisher.
Weight	Weigh the extinguisher and check the mass compared to the
_	fully charged extinguisher.
Hose and nozzle	Check that hoses and nozzles are clear and undamaged.
Operating instructions	Check that they are in place and legible.

Extract from Res. A.951(23) Inspection guide

#### Inspection and servicing (administrative barrier)

The lifespan of a powder, foam or water extinguisher is usually between 10 and 12 years. This is based on the extinguisher being in good condition with no corrosion or damage. Fire extinguishers that show signs of damage or corrosion are more likely to pose a significant risk when operated. At the time of the casualty the foam fire extinguisher was 17 years old.

Whilst in layover in Corpus Christi, USA, the ship would undergo its annual inspection and testing of the onboard firefighting arrangements, including all portable appliances in accordance with SOLAS Chapter II-2/14.2.2: and IMO Res. A.951(23).

Approved contractors Cobalt Blue USA Inc. attended the vessel and carried out a full annual inspection, testing and servicing of all on board portable fire extinguishers and fixed firefighting systems. The certificate issued (Appendix 1) detailed that all extinguishers were inspected, tested and found satisfactory.

Of the 48 portable foam fire extinguishers that were inspected 18 February 2022, 3 were removed from service and declared condemned by the ship's deck officers during planned maintenance inspections on 02 March 2022. In total, 8 of the fire extinguishers inspected on 02 March 2022, were condemned and removed from service by the ships deck officers due to observed corrosion or other visible defect.



Figure 5. Level of corrosion on ruptured foam extinguisher that had been inspected by Cobalt Blue

An opportunity was missed by the approved contractor to fail and remove the 8 severely corroded/damaged fire extinguishers, when they were presented for annual inspection. The failure to make recommendations to discard damaged or condemned fire extinguishers was a contributory factor.

### Planned maintenance (physical barriers)

The ISM Code requires that the safety management objectives of the Company should, amongst other things, assess the risks associated with all identified hazards in respect of its ships, personnel and the environment, and establish appropriate safeguards.

In accordance with section 10.1 of the ISM Code, the company operated an electronic planned maintenance system (AMOS Maintenance and Procurement) which outlines the duties and responsibilities of crew on board, with respect to equipment and systems.

The Company's generic risk assessment for shipboard operations highlighted the requirement to follow the guidelines contained within its cold work permit (Appendix 3) and onboard work instructions. When the officer could not remove the valve assembly as planned, an opportunity was missed to stop and reassess the plan.

The decision taken by second officer A to depress the handle as a result of not being able to remove the assembly cap, during dismantling was a contributory factor.

## 4. Conclusions

- A deck officer lost his life when the condemned fire extinguisher he was operating failed and ruptured at the base propelling it upwards, striking him in the chest.
- The officers were decommissioning the fire extinguishers in order to leave them in a 'safe' condition once disposed of. However, they were not fully aware of the risks associated with handling fire extinguishers where the material integrity was compromised.
- During the annual inspection in Corpus Christi, severely corroded fire extinguishers were passed for inspections with no recommendations being made to remove from service or replace with new units.
- At the time of the incident, the foam fire extinguisher that ruptured had been in service for 17 years from date of manufacture.
- Although medical and emergency services were situated close by in Eleusis, it took over forty minutes for assistance to arrive.
- The failed fire extinguisher, a vital piece of evidence and a key component in understanding what went wrong was seized by the prosecutor's office and taken into custody at the Elefsina coastguards office, acting on behalf of the Ministry of Justice. The BMA is currently awaiting its release in order to carry out detailed analysis and non-destructive testing to ascertain the cause of failure.

## 5. Lessons to be learned

- Servicing by shoreside personnel may not be sufficient to control risks. Crew should inspect each extinguisher for signs of corrosion, and where concerns arise, then these are to be raised and discussed with the safety officer on board.
- Pressure vessel failure can be catastrophic. Crew should be made aware of the potentially fatal risks associated with handling compromised pressure vessels and systems.
- Fire extinguishers should be mounted on brackets off the deck to reduce the chance of moisture from being trapped under the base. Fire extinguishers that are exposed to the elements require particular attention. Where possible they should be rotated with those stored internally to reduce the likelihood of corrosion.
- Where possible, decommissioning and disposal of fire extinguishers should be conducted by suitably qualified contractors.
- When discharging any fire extinguisher, the manufacturer's guidelines on the correct operation should be followed. Where guidelines have not been provided, crew are advised to place the extinguisher on the deck away from the body when operating the trigger.

## 6. Actions taken

#### Thenamaris Ship Management Inc. has:

- Amended its SMS to include industry best practice guidelines for the condemning and disposal of fire extinguishers, including instructions that all condemned (out of use / decommissioned) fire extinguishers must be opened / emptied by a specialized service provider and not by any member of crew.
- Updated its garbage management plan to include guidelines for managing condemned/out of use extinguishers as well as the development of a job description on the inspection of loose firefighting equipment, stipulating that any firefighting equipment found in unsatisfactory condition or doubt as to its material integrity, must be immediately removed from service and not be operated.
- Requested a visual training manual from newly appointed service providers which will be made available to ship's crew, as well as a new feedback form for use by the ship's master and/or the attending superintendents regarding the condition of all returned and inspected fire extinguishers in order to cross check the standard and quality of inspections carried out.
- Enforced that systems under pressure shall be stored in protective spaces and shall only be handled by competent service providers, following a companywide inspection regime on all portable firefighting appliances and instructed crew to remove/replace any extinguisher which are found to be sub-standard or where doubt as to their condition exists.
- Enacted a safety campaign focusing on the inspection of all fire extinguishers so as to increase crew awareness on the subject, as well as producing an information bulletin which will be distributed among its Fleet identifying the specific threats & risks associated with fire extinguishers.
- Created a policy focusing on new build vessels to install permanent pressurized portable fire extinguishers which are considered safer instead of the cartridge operated extinguishers.

#### The Bahamas Maritime Authority has:

• Issued a Safety Alert on safe handling of condemned fire extinguishers: <a href="http://www.bahamasmaritime.com/wp-content/uploads/2022/08/BMA-Safety-Alert-22-02-Safe-Handling-of-Condemned-Fire-Extinguishers.pdf">www.bahamasmaritime.com/wp-content/uploads/2022/08/BMA-Safety-Alert-22-02-Safe-Handling-of-Condemned-Fire-Extinguishers.pdf</a>

## 7. Recommendations

#### Cobalt Blue USA Inc. is recommended to:

• Review its internal policy and guidelines with respect to IMO Resolution A.951(23) where extinguishers undergoing annual inspection, showing signs of corrosion, dents or damage are to be condemned.

#### Hellenic Ministry of Justice is recommended to:

• Consider adopting a memorandum of understanding with the Hellenic Bureau for Marine Casualties Investigation to ensure effective investigation of transport accidents and any crimes associated with them, while maintaining the independence of those investigations and promoting effective cooperation between them.

## 8. Glossary and Definitions

СО	Chief Officer
CO <sub>2</sub>	Carbon Dioxide
Hydrostatic test	The function of a hydrostatic test is to ensure that a fire extinguisher can still withstand its pressure rating.
IMO	International Maritime Organization
ISM	International Safety Management
m	Metre
SMS	Safety Management System
SOLAS	International Convention for the Safety of Life at Sea
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
UTC	Coordinated Universal Time
VHF	Very High Frequency

## **Appendices**

## Appendix 1 – Certificate of Inspection Delivery note.

Y		ber of the Cobalt coup of Compani	Blue es Approved	ficate Nr: I by Lloyd's R	21 Register, Bur	202 - CBH - FE02 eau Veritas, ClassNK
		C	Certificate of Inspe	ection		
		Fire E	xtinguishers	Summa	iry	
Vessel :		SEACRO	ISS 1	Port of Call :	C	ORPUS CHRISTI
MO Nu	mber :	929789	0	Date :		FEB.18.2022
Flag :		BAHAM	AS			
			Description of Type	Codes		
DP - Dry I	Powder	FA = Foam Applicato	e	C/O - Cartrid	ge Operated	
FM = Foar	n	N2 = Nitrogen		S/P = Stored P	ressure	
CO2 = Car	rbon Dioxide	SC = Spare Cartridge	1	A/B = Chemic	al Reaction	
WT - Wat	er	SR = Spare Refill		P - Pilot Cyli	ıder	
	Mahar	Tana	Propellant Trans	Сар	acity	Remarks
Qty	макег	Type	r topenant i Spe	Kgr	Ltr	Pre-mar iso
Qty 43	SRI	FM	C/O	Kgr	Ltr 9	President Ref
Qty 43 4	SRI AUCA	FM FM	C/O S/P	Kgr	Ltr 9 9	
Qty 43 4 1	SRI AUCA SEAPLUS	FM FM FM	C/0 S/P C/0	Kgr	Ltr 9 9 9	
Qty 43 4 1	SRI AUCA SEAPLUS FAIN	FM FM FM FM FM	C/0 S/P C/0 C/0 C/0	Kgr	Ltr 9 9 9 135	
Qty 43 4 1 1 1	SRI AUCA SEAPLUS FAIN FAIN	FM FM FM FM CO2	C/0 S/P C/0 C/0 C/0 S/P	Kgr 1.5	Ltr 9 9 135	
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Qty 43 4 1 1 1 1 1	SRI AUCA SEAPLUS FAIN FAIN FAIN FAIN	FM FM FM FM CO2 FM CO2	C/O S/P C/O C/O S/P C/O S/P C/O S/P	1.5	Ltr 9 9 135 45	
Qty 43 4 1 1 1 1 1 1 1 1 9	MARCE SRI AUCA SEAPLUS FAIN FAIN FAIN SRI	FM FM FM FM C02 FM C02 C02 C02	C/O S/P C/O C/O S/P C/O S/P S/P S/P	Kgr 1.5 1 5	Ltr 9 9 135 45	
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Cobalt Blue USA, Inc. 2300 Tifton Street Suite C Kenner, LA 70062, USA Tel: (+1) 504 575-3022 E-mail: nola@cobaltblue-marine.com Website: www.cobaltblue-marine.com

Signature & Stamp

### **Appendix 2 – Certificate of Manufacture**

DOC No.: SRI-FEXI12MED-063

#### EUROPEAN COMMUNITY DECLARATION OF CONFORMITY Issued in accordance with the MARINE EQUIPMENT DIRECTIVE (MED)

This is to certify that in compliance with the Council Directive 96/98/EC of 20 December 1996 on marine equipment, as amended by Commission Directives 98/85/EC, 2001/53/EC, 2002/75/EC and 2002/84/EC of the European Parliament and of the Council:

#### STEEL RECON INDUSTRIES SDN. BHD.

No. 8, Jalan Subang 7, Taman Perindustrian Subang, 47610 Subang jaya, Selangor, Malaysia.

declares that the product(s) detailed below conform(s) to type as required by the above Direct.ves as evidenced by the Conformity Route below:

EC Type Examination (Module B) Certificate No. MED 0350159 issued by the Notified Body (LRV No. = 0038)

PLUS

EC (Module D) Certificate of Conformity No. 0300018 issued by the Notified Body (LRV No. = 0038)

MED Annex A.1	Item No.	A.1/3.2	
	Item Designation	PORTABLE FIRE EXTINGUISHER	
Manufacturer's Product	Code No.	FEX112	
	Description	9L FOAM CO2 CARTRIDGE TYPE	
Standards Applicable		SOLAS 74 as amended, Regulation II-2/6 EN 3-1/A1, 3-2, 3-3, 3-4, 3-5, 3-6 IMO Res. A. 602(15)	
Product(s) Batch/Lot No(	(s).	S 25 05 001 L	
Quantity		20 Unit	
Delivery Order No.		011058	
[Companies Stamp]		Signature	
		Name: Mr. David Ong	
		Position: QA Manager	
		Date: 28 JULY, 2005	
			1
Text(s) outstanding/other activ	ons required at shin (if a	(ny)	0038/05
resus) ousementgreeter activ	ous redones as sub (u.s		
(e.g. IMO Resolution MSC 81	(70) Part 2)		

## Appendix 3 - Cold/Pressurised System Work Permit (1 of 3)

ssued by: Safety & O	0				Cold/Pres	ssuriz	red S	System Wo	rk Pe
ssued to: All vessels	uality					I	Docu	ment code:	PTW
					Revision da	te: 26	<b>.08</b> .	2021   Revis	ion n
Vessel's Name:									
Issued DATE/TIME:			Validu	until	DATE/TIME				
West Description			Valid						
Work Description:									
Work Location:									
Other Permits requi	ired								
Cold/Pressure Work	Enclosed Space Entry	Pum	p room Entry		Electrical Worl	t i	Г	Hot Work	
Underwater Work	Work Aloft/Overside	Pers	onnel Transfer	+	Elevator Work		$\vdash$		
I									
	The validit	y of this p	ermit should	not e	exceed 8 hou	rs			
Note: This permit should be and fitting of valves, blanks,	e used for but not limited t , spades or blinds, Clean up	o the followin (ail spills), Use	g work: Blanking, of lathe machine	/de-bla and gri	nking, Disconnecti Inding wheels, Wo	ng and rk on pi	conne umps,	cting pipework, R Involving pressur	lemovi ized ta
bottles, piping and any othe	er equipment that normally	operates unde	r pressure or source	ce of er	nergy etc.				
					_ 1				
The system is free	from	Oil			Gas	_		Toxic G	ases
-		Steam			Pressure			Chem	icals
Section 1: General p	precautions								Che
Section 1: General p A risk assessment ha Duty officers have b	precautions as been created / re been informed (deck	viewed for & engine)	r this specific	work	¢				Che
Section 1: General p A risk assessment ha Duty officers have b Sufficient and famili	precautions as been created / re been informed (deck iar personnel are av	wiewed for & engine) ailable	r this specific	work	c if peeded				Che
Section 1: General p A risk assessment he Duty officers have b Sufficient and famili PPE has been provid Electrical equipment	precautions as been created / re been informed (deck iar personnel are av ded and properly wo at affected by the wo	wiewed for & engine) ailable orn, incl. po	r this specific prtable gas de	work	c or, if needed				Che
Section 1: General p A risk assessment ha Duty officers have b Sufficient and famili PPE has been provid Electrical equipmen Hazardous and com	precautions as been created / re been informed (deck iar personnel are av ded and properly wo it affected by the wo ibustible materials h	wiewed for & engine) ailable orn, incl. po ork has bee ave been r	r this specific ortable gas de en isolated (Li removed fron	work etecto OTO)	or, if needed	nding	area	a	Che
Section 1: General p A risk assessment ha Duty officers have b Sufficient and famili PPE has been provid Electrical equipment Hazardous and com Objects are property	precautions as been created / re been informed (deck iar personnel are av ded and properly wo at affected by the wo ubustible materials h y secured in order to	viewed fo & engine) ailable orn, incl. po ork has bee ave been r o avoid fall	r this specific ortable gas de isolated (Li removed from ing, trips and	etecto OTO) n woo	or, if needed	nding	; area	a	Che
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