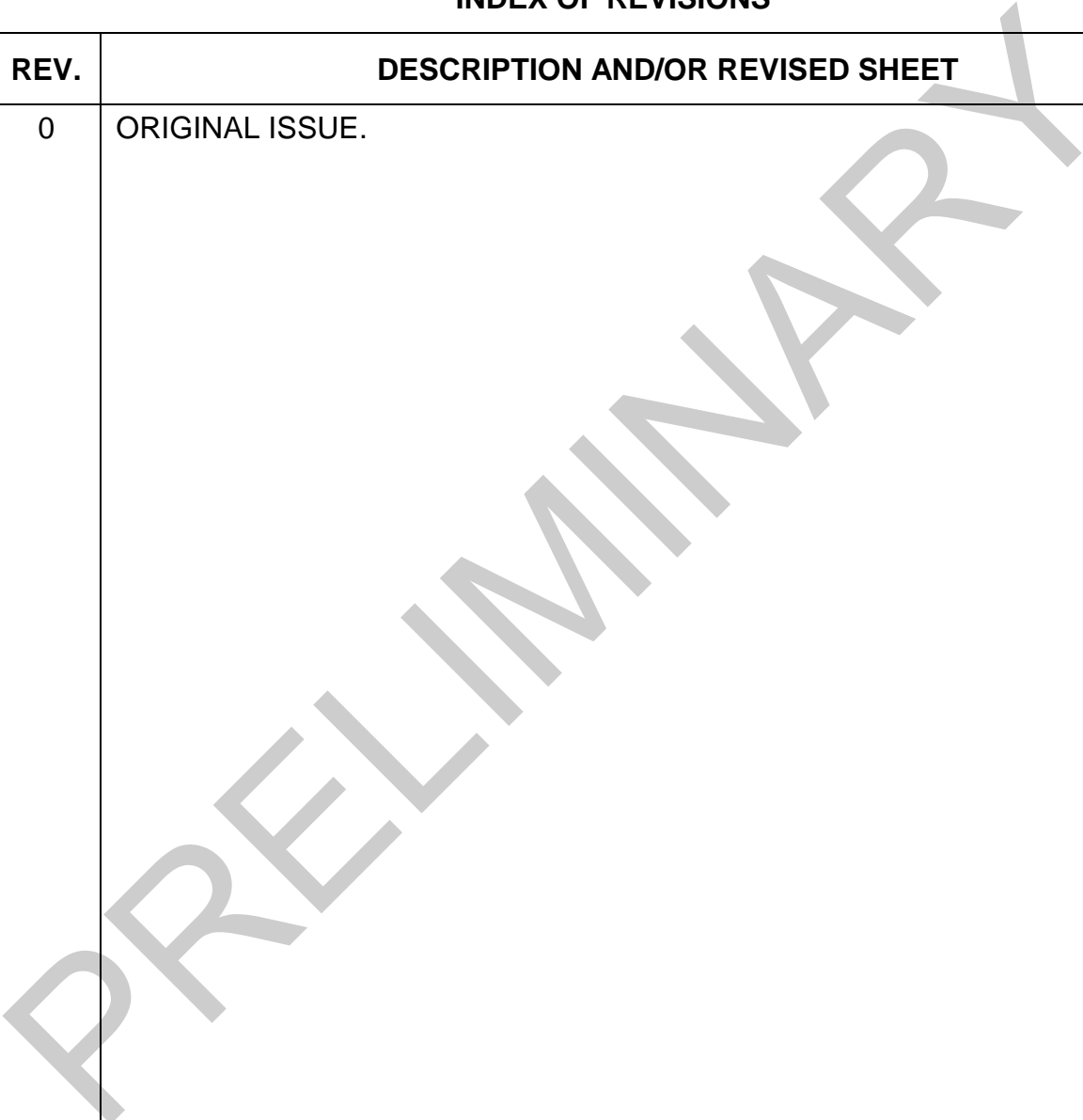
	TECHNICAL SPECIFICATION		No. I-ET-3010.00-5400-947-P4X-010						
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EXECUTION	ADINAN								
CHECK	DANIELA								
APPROVAL	B.FERREIRA								
THE INFORMATION CONTAINED IN THIS DOCUMENT IS PETROBRAS PROPERTY AND MAY NOT BE USED FOR PURPOSES OTHER THAN THOSE SPECIFICALLY INDICATED HEREIN.									
THIS FORM IS PART OF PETROBRAS N-381 REV. J ANNEX A – FIGURE A.1.									



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PASSIVE FIRE PROTECTION SYSTEM

NP-1

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PRELIMINARY

1 SCOPE

This specification defines guidelines and minimum requirements for supplying of Fire Extinguishers to be installed in an offshore unit.

2 ABBREVIATIONS


The following abbreviations are applicable:

- DPC: Diretoria de Portos e Costas.
- FPSO: floating, production, storage and offloading
- TEM: Ministério do Trabalho e Emprego

3 APPLICABLE REGULATIONS, CODES AND STANDARDS

Regulations to be followed in the design, installation and testing of the fire extinguishers are stated below. SUPPLIER shall produce evidence of having complied with all regulations, always in their latest editions, as well as with the requirements defined in this specification. In case of items in conflict with this document, PETROBRAS shall be consulted.

- 3.1 IMO - SOLAS: Convention for the Safety of Life at Sea – 1974 and Amendments in Force;
- 3.2 NFPA 10: Standard for Portable Fire Extinguishers;
- 3.3 Regulamentações do Ministério do Trabalho e Emprego (MTE) – Normas Regulamentadoras – NR-30 - Segurança e Saúde no Trabalho Aquaviário;
- 3.4 ABNT-NBR 15808: Extintores de Incêndio Portáteis (meaning: Portable Fire Extinguishers – Brazilian Technical Standards Association);
- 3.5 ABNT-NBR 15809: Extintores de Incêndio Portáteis sobre Rodas (meaning: Wheeled Fire Extinguishers - Brazilian Technical Standards Association);
- 3.6 Regulamentos Aplicáveis da Autoridade Marítima Brasileira (DPC) - NORMAM;

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<p>3.7 ABNT-NBR 9695: Pó para Extinção de Incêndio (meaning: Chemical Powder for Fire Extinguishing – Brazilian Technical Standards Association);</p> <p>3.8 ABNT-NBR 12693: Sistemas de Proteção por Extintor de Incêndio (meaning: Fire Extinguishing Systems – Brazilian Technical Standards Association);</p> <p>3.9 ABNT-NBR 12962: Inspeção, Manutenção e Recarga em Extintores de Incêndio (meaning: Inspection, Maintenance and Reloading of Fire Extinguishing Systems – Brazilian Technical Standards Association);</p> <p>3.10 ABNT-NBR 12962: Cilindro de aço, sem costura, para fabricação de extintores de incêndio portáteis e sobre rodas com carga de até 10 kg de CO₂ — Requisitos e métodos de ensaio (Seamless Steel cylinder for Manufacturing of Up-To-Ten-kilogram Wheeled CO₂ Fire Extinguishers – Requirements and Methods for Testing - Brazilian Technical Standards Association);</p> <p>3.11 Requirements of the Classification Society of the Unit;</p>			
<p>4 TECHNICAL REQUIREMENTS</p>			
<p>4.1 GENERAL</p>			
<p>4.1.1 The fire extinguishers have diversity use and extinguishing capability rated. The classification of fire extinguishers, agent extinguisher quantity, number of extinguishers and the placement of fire extinguishers shall be defined in project approved by maritime authority and follow the item 3 above (Applicable regulations, codes and standards).</p>			
<p>4.1.2 It is recommended that priority use fire extinguishers of higher extinguishing capability rated, lower weight and longer between maintenance.</p>			
<p>4.1.3 It should be noted the use of shelter or protective cover for the fire extinguishers in the external areas allocated for protection against saline atmosphere.</p>			

4.1.4 Fire extinguishers shall have INMETRO stamp certification, be on validity period and be read for swift use in designated local.

4.1.5 It shall be able to withstand the sea/salt atmosphere and shall be painted with anti-corrosion type paint. They shall be painted with safety red color (Munsell 5R 4/14).

4.2 FIRE EXTINGUISHER TYPES

Technical requirements established in this specification apply to equipment, accessories and materials listed below:

4.2.1 Stored-Pressure Water Fire Extinguishers

4.2.1.1 The stored-pressure water fire extinguishers are those containing water and the gas within the same cylinder, being the discharge of extinguishing agent is made continuously.

4.2.1.2 Construction details shall be as required in ABNT-NBR 15808 Standard and the main technical requirements are listed below:

- Water capacity: 10 liters;
- Fire extinguisher weight should not exceed 15 kg when completely loaded;
- Suitable for beginning of fire fighting class A;
- Extinguishing capability should be at least 2-A;
- Maximum discharge time 80 seconds;
- The cylinder shall hold both water and pressurization gas. Charge shall be kept under constant pressure (direct pressurization);
- Hose shall be non-collapsing type and provided with a brass connector end;
- Extinguishers shall be able to withstand the sea/salt atmosphere and shall be painted with anti-corrosion type paint;
- Extinguishers shall be painted with safety red color (Munsell 5R 4/14);

- Extinguishers shall be provided with suitable means, attached to the body of the bottle, to hang it up on a hook on the wall, if the platform is semi-submersible or F.P.S.O allowing for swift use;
- Estimated dimensions:
 - Height: 705 mm
 - Diameter: 177 mm

4.2.2 CO₂ Fire Extinguishers

4.2.2.1 The CO₂ fire extinguishers must be fitted with control device for stopping the agent discharge.

4.2.2.2 Construction details shall be as required in ABNT-NBR 15808 e ABNT-NBR 16357 Standards and the main technical requirements are listed below:

- CO₂ loading capacity: 6 kg of carbon dioxide;
- Extinguisher weight shall not exceed 20 kg, when completely loaded;
- Suitable for beginning of fire fighting class B and C;
- Extinguishing capability should be at least 5-B:C;
- Maximum discharge time 25 seconds;
- Extinguishers shall be provided with a controlling device to stop discharge;
- Valve shall be made of brass;
- Discharge valve should be intermittent type, forged brass, with cable and trigger of steel, equipped with safety valve with rupture disc;
- Nozzle shall be conical in shape and provided with a brass adapter for fitting to hose;
- Hose shall be non-collapsing rubber type fitted with brass connector;
- Extinguishers shall be able to withstand the sea/salt atmosphere and shall be painted with an anti-corrosion paint type;
- Shall be painted with safety red color (Munsell 5R 4/14);

- Extinguishers shall be provided with suitable means, attached to the body of the bottle, to hang it up on a hook on the wall, if the platform is semi-submersible or F.P.S.O, allowing for swift use;
- Estimated dimensions:
 - Height: 660 mm
 - Diameter: 165 mm

4.2.3 Stored-Pressure Chemical Powder Fire Extinguishers (ABC):

4.2.3.1 The stored-pressure chemical powder fire extinguishers must be provided with a trigger device for interrupting the discharge.

4.2.3.2 Construction details shall be as required in ABNT-NBR 15808 Standard and the main technical requirements are listed below:

- Extinguishing agent: monoammonium phosphate;
- Monoammonium phosphate loading capacity: 6 kg or 12 kg;
- Extinguisher weight shall not exceed 23 kg, when completely loaded;
- Suitable for beginning of firefighting class A, B and C;
- Extinguishing capability should be at least 3-A:20-B:C (for loading capacity: 6 kg);
- Extinguishing capability should be at least 6-A:30-B:C (for loading capacity: 12 kg);
- Maximum discharge time 15 seconds (for loading capacity: 6 kg);
- Maximum discharge time 30 seconds (for loading capacity: 12 kg);
- The cylinder shall hold both chemical powder and pressurization gas. Charge shall be kept under constant pressure (direct pressurization);
- Discharge valve should be intermittent type, forged brass, with cable and trigger of steel;
- Extinguishers shall be provided with a control device to stop discharge, of trigger type, made of stout nylon, attached by means of a thread and fitted to the hose end;

- Hose shall be non-collapsing rubber type fitted with brass connector;
- Extinguishers shall be able to withstand the sea/salt atmosphere and shall be painted with an anti-corrosion paint type;
- Shall be painted with safety red color (Munsell 5R 4/14);
- Extinguishers shall be provided with suitable means, attached to the body of the bottle, to hang it up on a hook on the wall, if the platform is semi-submersible or F.P.S.O, allowing for swift use;
- Estimated dimensions:
 - Height: 600 mm
 - Diameter: 150 mm

4.2.4 Stored-Pressure Chemical Powder Fire Extinguishers (BC):

4.2.4.1 Construction details shall be as required in ABNT-NBR 15808 Standard and the main technical requirements are listed below:

- Extinguishing agent: Sodium bicarbonate;
- Sodium bicarbonate loading capacity: 6 Kg;
- Extinguisher weight shall not exceed 10 kg, when completely loaded;
- Suitable for beginning of firefighting class B and C;
- Extinguishing capability should be at least 20-B:C;
- Maximum discharge time 25 seconds;
- The cylinder shall hold both chemical powder and pressurization gas. Charge shall be kept under constant pressure (direct pressurization);
- Discharge valve should be intermittent type, forged brass, with cable and trigger of steel;
- Extinguishers shall be provided with a control device to stop discharge, of trigger type, made of stout nylon, attached by means of a thread and fitted to the hose end;
- Hose shall be non-collapsing rubber type fitted with brass connector;
- Extinguishers shall be able to withstand the sea/salt atmosphere and shall be painted with an anti-corrosion paint type;

- Shall be painted with safety red color (Munsell 5R 4/14);
- Extinguishers shall be provided with suitable means, attached to the body of the bottle, to hang it up on a hook on the wall, if the platform is semi-submersible or FPSO, allowing for swift use;
- Estimated dimensions:
 - Height: 590 mm
 - Diameter: 137 mm

4.2.5 Stored-Pressure Foam Fire Extinguishers:

4.2.5.1 The stored-pressure foam fire extinguishers are those containing water, LGE and the gas within the same cylinder, and the discharge of extinguishing agent kept under constant pressure.

4.2.5.2 Construction details shall be as required in ABNT-NBR 15808 Standard and the main technical requirements are listed below:

- Extinguishing Agent: Potassium Acetate;
- Potassium Acetate loading capacity: 9 liters;
- Suitable for beginning of firefighting class K;
- Maximum discharge time 90 seconds;
- Cylinder manufactured in polished stainless steel;
- Small discharge hose length, approximately 560mm;
- Discharge nozzle assembled in angle of 45°;
- Extinguishing capability should be at least 2-A:K;
- Discharge valve in plated brass;
- Handle type stainless steel;
- Improved visibility during firefighting;
- Low pH agent;
- Estimated dimensions:
 - Height: 600 mm
 - Diameter: 176 mm

4.2.6 Wheeled CO₂ fire extinguishers:

4.2.6.1 Construction details shall be as required in ABNT-NBR 15808, ABNT-NBR 15809 e ABNT-NBR 16357 Standards and the main technical requirements are listed below:

- CO₂ loading capacity: 25 kg;
- Suitable for beginning of fire fighting class B and C;
- Extinguishing capability should be at least 10-B:C;
- Maximum discharge time 30 seconds;
- Extinguishers shall be provided with a control device to shut off discharge;
- Extinguishers shall be provided with a safety valve;
- Carrier shall be able to withstand three times the weight of bottle plus charge;
- Fire Extinguishers shall be able to withstand the sea/salt atmosphere and shall be painted with an anti-corrosion paint type;
- They shall be painted with safety red color (Munsell 5R 4/14);
- Estimated dimensions:
 - Height: 1360 mm
 - Diameter: 219 mm

4.2.7 Wheeled chemical powder fire extinguishers (ABC):

4.2.7.1 Construction details shall be as required in ABNT-NBR 15808 e ABNT-NBR 15809 Standards and the main technical requirements are listed below:

- Extinguishing Agent: Monoammonium Phosphate;
- Monoammonium Phosphate loading capacity: 25 Kg;
- Suitable for beginning of fire fighting class A, B and C;
- Extinguishing capability should be at least 20-A:120-B:C;
- Maximum discharge time 40 seconds;
- The cylinder shall hold both chemical powder and pressurization gas. Charge shall be kept under constant pressure (direct pressurization);
- Discharge valve should be intermittent type, forged brass, with cable and trigger of steel;
- Relief Valve Chrome plated brass and set to relieve excess pressure;
- Cylinder made of steel plate, welded longitudinally, with closure by cap (top and bottom);
- They shall be provided with non-collapsing rubber hose type fitted with brass connector. With at least 3.0 m length and endowed with diffuser, squirt or pistol; For the helideck application rubber hose shall have sufficient length to reach the touchdown circle, starting from foam monitor platform;
- Extinguishers shall be able to withstand the sea/salt atmosphere and shall be painted with an anti-corrosion paint type;
- Wheels with rubber tires for good grip on the road;
- They shall be painted with safety red color (Munsell 5R 4/14);
- Estimated dimensions:
 - Height: 1200 mm
 - Diameter: 177 mm

4.2.8 Wheeled chemical powder fire extinguishers (BC):

4.2.8.1 Construction details shall be as required in ABNT-NBR 15808 e ABNT-NBR 15809 Standards and the main technical requirements are listed below:

- Extinguishing Agent: Sodium Bicarbonate;
- Sodium Bicarbonate loading capacity: 50 Kg;
- Suitable for beginning of firefighting class B and C;
- Extinguishing capability should be at least 40-B:C;
- Maximum discharge time 50 seconds;
- The cylinder shall hold both chemical powder and pressurization gas. Charge shall be kept under constant pressure (direct pressurization);
- Discharge valve should be intermittent type, forged brass, with cable and trigger of steel;
- Relief Valve Chrome plated brass and set to relieve excess pressure;
- Cylinder made of steel plate, welded longitudinally, with closure by cap (top and bottom);
- They shall be provided with non-collapsing rubber hose type fitted with brass connector. With at least 5.0 m length and endowed with diffuser, squirt or pistol; For the helideck application rubber hose shall have sufficient length to reach the touchdown circle, starting from foam monitor platform;
- Extinguishers shall be able to withstand the sea/salt atmosphere and shall be painted with an anti-corrosion paint type;
- Wheels with rubber tires for good grip on the road;
- They shall be painted with safety red color (Munsell 5R 4/14);
- Estimated dimensions:
 - Height: 1155 mm
 - Diameter: 360 mm

4.2.9 Protecting lockers:

- 4.2.9.1 All portable extinguisher installed outdoors (outside of rooms) shall be kept in lockers to be protected against the weather conditions.
- 4.2.9.2 Lockers shall be made of orthophtalic polyester resin strengthened with fiberglass.
- 4.2.9.3 The outside of lockers shall be painted with safety red color (Munsell 5R 4/14).
- 4.2.9.4 Door of the locker shall be provided with a built-in puller and with latches and hinges made of chrome-plated brass.
- 4.2.9.5 Estimated dimensions:
- Height x width x depth: 970 mm x 470 mm x 346 mm
- 4.2.9.6 Weight: 10 Kg;
- 4.2.9.7 Wheeled Fire Extinguishers shall be provided with red canvas (tarpaulin) covers. Covers shall fully envelop to protect Extinguishers from the sea air.
- 4.2.9.8 The SUPPLIER shall also provide Extinguishers with all accessories for attachment thereof at work sites.
- 4.2.9.9 Fire Extinguisher instructions label shall be in Brazilian Portuguese language.

4.3 MINIMUM DOCUMENTS REQUIRED:

The SUPPLIER shall provide the technical documents listed below:

- 4.3.1 Certificates and stamp certification INMETRO;



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- 4.3.2** Drawings for each type of extinguisher along with the following information: height, diameter, weight, construction materials, details for attachment, assembly drawings and details of equipment / accessory, operation and maintenance manual, details of valves and safety devices.

- 4.3.3** Operation and maintenance manual shall contain a list of extinguishers furnished and respective dates of water tests carried out.

PRELIMINARY