	TECHNICAL SPECIFICATION         №:         I-ET-3010.00-5400-947-P4X-004										
[=]=]		CLIENT:							SHEET:	1 <sub>of</sub>	12
	44	JOB:								-	
PETROBRAS		AREA:									
		TÍTLE:									
SR	GE			LIFE S	AVING E		IENT				
									E	SUP	
MICRO	SOFT WO	ORD / V	′. 2013 / I-ET-3	8010.00-5400	)-947-P4X	004_C.DC	CX				
				INDE	OF RE	VISION	S				
REV.			DES	SCRIPTIC	ON AND	OR RE	VISED SH	HEETS			
0	ORIO SAV	GINAL	Cancels	and repla IT	ces I-ET	-3010.0	0-5400-94	47-PPC-	.024_D	LIFE	
	0, 11										
Δ	REV	ISED	WHERE IN	NDICATE	D						
Б	REV	ISED	WHERE IN	NDICATE	D						
D											
С	REV	ISED	WHERE IN	NDICATE	D						
									<u> </u>		
DATE	RI	EV. 0	REV. A	REV. B	REV. C	REV. D	REV. E	REV. F	REV. G	6 R	EV. H
		10/18 10/18	JUN/12/20	NUV/21/22	JAN/01/23				-		
DESIGN					EPS LIEVO				-		
									-		
			B/9G	EKOU			├		-		
FORM OWNED	TO PETROBI	RAS N-381	REV. L				LINT ON OOL.				

		TECHNICAL SPECIFICATION I-ET-3010.00-5400-947-	P4X-004	REV.	В
BR		PETROBRAS	SHEET:	2 <sub>of</sub>	12
PET	ROBRAS			NP-1	
				ESUP	
		SUMMARY			
1	SCOPE				3
2	DEFINI				3
3	APPLIC	ABLE STANDARDS AND RECOMMENDATIONS			3
4	TECHI				5
	4.1 Re	equirements for Breathing Device/ Box			5
	4.2 Re	equirements for Portable O <sub>2</sub> / Gas Detector			6
	4.3 Re	equirements for Eye-washing Unit			7
	4.4 Re	equirements for Emergency Shower			8
	4.5 Re	equirements for Stretcher			8
	4.6 Re	equirements for Emergency Escape Breathing Device (EEBD	)		8
5	SCOPE	OF SUPPLY			9
	5.1 Br	eathing Apparatus			9
	5.2 Po	ortable O <sub>2</sub> /Gas Detector			10
	5.3 Er	nergency Shower and Eye-washing Unit			10
	5.4 St	retcher			11
	5.5 Er	nergency Escape Breathing Device (EEBD)			11
6	ANNEX	·			12

	TECHNICAL SPECIFICATION	<sup>№</sup> I-ET-3010.00-5400-947-	P4X-004	REV.	В
BR	PETROBR	AS	SHEET:	} of	12
PETROBRAS				NP-1	
			1		

#### ESUP

## 1 SCOPE

This specification defines the minimum requirements for life-saving equipment to be installed in an Offshore Unit.

# 2 **DEFINITIONS**

The following definitions are applicable:

- Self-Contained Breathing Apparatus: device to be used by someone that needs to enter in places where the air is contaminated.
- Main Escape Route: a demarcated route to conduct people to Muster / Embarkation Station.
- Secondary Escape Route: a demarcated route to conduct people from a certain place to a main escape route.
- Portable O2/ Gas detector: device to measure the concentration of oxygen in confined atmospheres as well as in areas exposed to the presence of explosive atmosphere (combustible gas). The combination oxygen and combustible gas monitor will be used to test atmospheres for sufficient content for life support and/or the presence of combustible gases or vapor posing a potential flammability explosion hazard.
- Emergency Shower: unit designed to wash an individual's head and body, which has come into contact with hazardous chemicals.
- **Eye Wash Unit:** unit for washing chemicals or substances that might splash into an individual's eyes before he or she can seek further medical attention.
- Strecher: apparatus used to transport wounded or unconscious people
- Emergency Escape Breathing Device (EEBD): supplied air device to be used by someone that needs to escape from a compartment that has a hazardous atmosphere to a safe area.

# **3 APPLICABLE STANDARDS AND RECOMMENDATIONS**

Regulations to be followed in the design, manufacture, installation and testing of the Life Saving Equipment 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 any disagreement, it shall be

	TECHNICAL SPECIFICATION <sup>№</sup> I-ET-3010.00-5400-947-I	P4X-004	REV.	В				
BR	PETROBRAS	SHEET: 4	of	12				
PETROBRAS	LIFE SAVING EQUIPMENT							
		ES	UP					
submit	ted to PETROBRAS for approval.							
•	NFPA 1981: Standard on open-circuit self-contained breathing apparatus for							
	fire and emergency services;							
•	ABNT-NBR 13716: Equipamento de proteção respir	atória -	másc	ara				
	autônoma de ar comprimido com circuito aberto (meaning	j: Open-cir	cuit s	elf-				
	contained breathing apparatus);							
•	IMO - SOLAS: International convention for the safety of	life at sea	ı - 19	74,				
	and amendments in force;							
•	IMO - international life-saving appliance code (LSA Code)	);						
•	NORMAM 01: Normas da autoridade marítima pa	ara emba	arcaçõ	ões				
	empregadas na navegação em mar aberto - Ministério	da Marinh	a - D	PC				
	(meaning: Brazilian Maritime authority standard for offsho	re navigati	ion);					
•	NORMAM 05: Normas da autoridade marítima para	homologa	ação	de				
	material e autorização de estações de manutenção - Mini	stério da N	/larinh	าa -				
	DPC (meaning: Brazilian Maritime authority standard for m	naterial cer	tificat	tion				
	and maintenance stations);							
•	Brazilian Ministry of Labor and Social Security – Br	azilian Re	gulat	ory				
	Standards - NRs Normas Regulamentadoras (meaning: B	razilian Re	gulat	ting				
	Norms);							
•	ABNT-NBR 8447: Equipamentos elétricos para atmosfe	ras explo	sivas	de				
	segurança intrínseca - Tipo de proteção "I" (meaning: E	3razilian T	echn	ical				
	Standard Association - Equipment for explosive atmos	spheres -	Intrir	ISIC				
	safety - Type of protection "I";			_				
•	IEC 60079-11: Explosive atmospheres - PART 11: Equip	ment prote	ection	ı by				
				•				
•	International code for fire safety systems - FSS Code Cha	ipter 3 Sec	tion 2	2;				
•	Classification society requirements;	•	<b>,</b>	,				
•	INIO-MODU Code: Code for the construction and equ	lipment o	r mol	bile				
	onshore drilling units -1989 edition, and amendments in fo	orce.	,					
•	ANSI/ISEA Z358.1-2009: Emergency Eyewash and Show	er Equipm	ient					
•	ABN I NBR 16291 – Showers and Emergency Eyewash	• ·						
•	DR-ENGP-I-1.15 Diretrizes de Engenharia – Código de C	<i>Jores</i> (Eng	jineer	ing				

	TECHNICAL SPECIFICATION <sup>№</sup> I-ET-3010.00-5400-947-	-P4X-004	rev. B
BR	PETROBRAS	SHEET: 5	of 12
PETROBRAS		NI	P-1
		ESUP	
	Guidelines – Color Code)		
4 TEC	CHINICAL REQUIREMENTS		
4.1 Req	uirements for Breathing Device/ Box		
4.1.1 Bre aut cyl	eathing Device shall be provided with a compressed air cyl omatic supply valve, safety valve, protecting mask, wi inder with mask and parts to attach to the body of the user.	linder, cheo ndpipe co	ck valve, nnecting
4.1.2 Co	mpressed air cylinder shall hold at least 1.2 m³ at 25 °C.		
4.1.3 Ap	ressure gauge shall be provided.		
4.1.4 Bre	eathing apparatus shall be of the open system (without air re	ecirculation	).
4.1.5 Fa cha	ce mask shall be only one piece with a wide peripheric visio aracteristics:	on and the f	following
_	Made of cilicon with wide curfocou		

- Made of silicon with wide surface;
- Silicon stripes fixed in the lens frame and adjusted by metallic buckle;
- Easy to put it in and off;
- Lenses fixed in the mask by a strong frame, treated against abrasion;
- The mouthpiece houses: a removable nasal "Cuba", a commutating diaphragm (communication membrane) and a breathe valve attached to the second stage regulator by a quick connection in order to receive a positive pressure demand valve;
- Adequate place for visualization of the electronic display.
- 4.1.6 It shall be furnished with a positive pressure valve inside the face mask.
- 4.1.7 Breathing apparatus shall be provided with two different and independent sound and visual alarms indicating to the user low air pressure, as required by NFPA 1981. A visual alarm shall be provided in the face mask indicating by LED the amount of air in the cylinder (100%, 75%, 50%, 25% and empty) additionally an external red LED alarm actuating when cylinder capacity reaches 25%.
- 4.1.8 It shall be furnished with a device in order to automatically control the air supply, according to user breathing capacity, whenever user is breathing at a rate of up to 85 L/min, the cylinder supply pressure shall stands above 1080 kPa.
- 4.1.9 It shall be supplied with a by-pass of the automatic air supply valve.
- 4.1.10 Equipment shall be made of materials that are suitably stout, durable and able to withstand deterioration caused by heat or wet, and also it shall not allow admission of smoke into breathing air stream.

	TECHNICAL SPECIFICATION I-ET-3010.00-5400-947-	P4X-004	REV.	В	
BR	PETROBRAS	SHEET: 6	of	12	
PETROBRA		NP-1			
		ESUP			
4.1.11	It shall be complete and ready for use the arrangement shall r 12 kg.	not be hear	vier tl	han	
4.1.12	Cylinders shall be painted in gray color with photo luminescen better visualization in the dark.	nt yellow st	ripes	for	
4.1.13	Cylinders shall be of total composite material (carbon fiber) wit of 15 years, provided with fluorescent pressure gauge installed	h at least a l.	a lifet	ime	
4.1.14	It shall be supplied with cylinder hydrostatic test certificate.				
4.1.15	It shall be supplied with an additional outlet connection for an e	external us	ər.		
4.1.16	It shall be supplied with quick recharge system with filling static	on.			
4.1.17	It shall be supplied with second stage regulator of quick connect	ction type.			
4.1.18	The electric charges of pressure transmitter and display shall battery, suitable for Group IIA, Zone 1, T3.	be done b	y lithi	ium	
4.1.19	Breathing Apparatus not stowed in normal Fireman's Outfit Lo in separate boxes.	ckers shal	be k	cept	
4.1.20	SUPPLIER shall provide Boxes made of fiberglass, painted in (Munsell notation 2.5 G 5/10).	safety gre	en c	olor	
4.1.21	The boxes lids shall be easy to open in case of emergency transparent, in way to protect the equipment from solar rays.	and shoul	d not	be	
4.1.22	The following legend shall be written on the front of the Boxes AUTÔNOMO DE RESPIRAÇÃO" (Breathing Apparatus). Lette and stand 70 mm high, 40 mm in width, 10 mm thick and 5 mm	: "EQUIPA rs shall be n apart.	MEN in w	ITO hite	
4.2 F	equirements for Portable O <sub>2</sub> / Gas Detector				
4.2.1	Detectors shall be high impact and flameproof, resistant to imp	act and fal	I.		
4.2.2	It shall be provided with static armored protection against rad and electromagnetic compatibility (EMC).	lio frequen	cy (F	RFI)	
4.2.3	Detectors shall be microprocessor controlled with computer logging.	interface 1	<sup>i</sup> or da	ata-	
4.2.4	Detectors shall be digital meter, Liquid crystal display type, wi 10 mm size.	ith digits of	at le	east	
4.2.5	Detectors shall have a minimum of 8 hours in continuous opera	ation, at 25	°C.		
4.2.6	Detectors shall have alkaline replaceable 1.5 V batteries.				
4.2.7	Detectors shall be intrinsically safe, certified for operation ir (Group IIA, Zone 1, T3).	n hazardou	is ar	eas	

		TECHNICAL SPECIFICATION I-ET-3010.00-5400-947-	P4X-004	REV.	В
BR		PETROBRAS	SHEET: 7	of	12
PETROBRA	4 <i>5</i>		N	P-1	
			ES	SUP	
4.2.8	Ren Mini	note sampling equipment (probe, sampling line and pump) mum sampling line shall be 1.5 m.	) shall be s	suppl	ied.
4.2.9	Lea	ther case with holder for transport action shall be supplied.			
4.2.10	Kit f	or calibration with all necessary accessories shall be suppli	ied.		
4.2.11	Aud shal	ible and visual alarm indicating a representative of % LEL ( I be available.	(adjustable	epett	ing)
4.2.12	Aud	ible and visual alarm to indicate low level battery shall be a	vailable.		
4.2.13	Bac low	klit LCD Display shall have a device that facilitates the rea visibility.	ding in pla	ices \	with
4.2.14	Con shal	npacting lightweight unit, the complete device with all access I not exceed 0.90 kg.	sories for c	opera	tion
4.2.15	Aud	ible and visual alarm indicating low oxygen concentration s	hall be ava	ailabl	e.
4.2.16	Port Clas	able oxygen and combustible gas monitors shall be ssification Society.	approved	by	the
4.3 R	Requ	irements for Eye-washing Unit			
4.3.1	Bas	in shall be in stainless steel.			
4.3.2	Unit Sho	shall have valve worked by lever or through the base wer and Eye-Washing Units.	of the En	nerge	ncy
4.3.3	Whe mac	en walk on platform is used, spiral spring under the base le in stainless steel.	of the unit	shal	l be
4.3.4	Unit	shall have aerated stainless steel sprays, with spray streng	gth govern	or.	
4.3.5	Unit	shall be "Y" type by-pass filter.			
4.3.6	Anti (Mu colo	-corrosion painting shall be used. Eye-washing unit piping nsell 10 GY 6/6) and have adhesive strips in bright yellow (I rs.	g shall be Munsell 2.9	in gr 5 Y 8,	een /12)
4.3.7	Only	y potable water shall be used.			
4.3.8	Unit take mat	shall be installed close to places where handling and storin place, and where there is a risk of skin and/or eyes in erials.	ng of cherr juries due	icals to s	will uch
4.3.9	Eye and	-washing Units shall be provided with a minimum pressure of the maximum pressure shall not exceed 80 psi (5.516 bar)	of 30 psi (2 ).	.068	bar)
4.3.10	Eye injur	wash thermal protection valves shall be supplied in order to y by hot water.	o reduce tl	ne ris	k of



	TECHNICAL SPECIFICATION <sup>№</sup> I-ET-3010.00-5400-947-F	P4X-004 REV. B
BR	PETROBRAS	sheet: 9 of 12
PETROBRAS		NP-1
		ESUP
4.6.2 EEI thai	3D shall be complete and ready for use, the arrangement sin 5 kg.	hall not be heavier
4.6.3 Fac in a	e mask shall be only one piece with a wide peripheral visior nd off.	ו and easy to put it
4.6.4 Res	servoir shall have service duration of 10 min.	
4.6.5 Res	servoir shall be rechargeable by existing Unit Air Breathing S	System.
4.6.6 An	inactivated EEBD shall be capable of being carried hands-fr	ee.
4.6.7 An	EEBD, when stored, shall be suitably protected from the env	vironment.
4.6.8 Brie the whe	of instructions or diagrams clearly illustrating the use shall be EEBD. The donning procedures shall be quick and easy to sere there is a little time to seek safety from a hazardous atm	<ul> <li>clearly printed on allow for situations osphere.</li> </ul>
4.6.9 Mai with prin	ntenance requirements, manufacturer's trade mark and seria raccompanying manufacture date and name of approving rted on each EEBD.	al number, shelf life authority shall be
4.6.10 Cyli stee app	inders shall have at least a lifetime of 15 years and shall be of el material or similar in weight and resistance, provided f proved type.	aluminum, carbon that it shall be an
4.6.11 lt sl	nall be supplied with a cylinder content indicator.	
4.6.12 lt sl	nall be supplied with shoulder trap.	
4.6.13 lt sl	nall be supplied with a storage cabinet and means to suppor	t it on the wall.
4.6.14 lt sl	nall be supplied in orange safety color.	
4.6.15 lt sł	nall be supplied with cylinder hydrostatic test certificate.	
5 SCC	OPE OF SUPPLY	
5.1 Brea	thing Apparatus	
5.1.1 Doc	cuments	
a)	SUPPLIER shall provide equipment full specifications such	i as:
	• Dimensions;	
	• Weight;	
	• Materials.	
b)	SUPPLIER shall provide Box drawings, showing:	

• Dimensions;

	B
PETROBRAS SHEET: 10	of 12
	IP-1
E	SUP
Weight;	
Attachment details;	
Materials.	
5.1.2 Equipment	
a) SUPPLIER shall also provide all attachment devices.	
5.1.3 Certificates	
<ul> <li>a) SUPPLIER shall provide Certificates of Approval issued by MINIST TRABALHO (meaning: Brazilian Labor Authority) or Certificates re by the origin country responsible institution.</li> </ul>	ÉRIO DO cognized
5.2 Portable O <sub>2</sub> /Gas Detector	
5.2.1 Documents to be presented at BID Phase	
Data sheet and catalog in Portuguese language describing the	technical
characteristics of the monitor;	
<ul> <li>Dimensional drawings with operating procedures and instruction</li> </ul>	s;
<ul> <li>The manufacturer shall present a conformity certificate of the e</li> </ul>	quipment
for explosive atmospheres;	
The manufacturer shall present a certificate of conformity iss	ued by a
recognized entity in accordance with INMETRO rules;	
List of firms for Technical Assistance in Brazil.	
5.2.2 Documents to be presented for Purchase	
<ul> <li>Maintenance and operation manual, in Portuguese language;</li> </ul>	
Spare parts list;	
<ul> <li>Document, including drawings, detailing all monitor's component</li> </ul>	S;
<ul> <li>Certificate of Approval issued by INMETRO;</li> </ul>	
<ul> <li>Certificate of conformity of the monitor for explosive atm</li> </ul>	ospheres
applications.	
5.3 Emergency Shower and Eye-washing Unit	
5.3.1 Documents	
a) SUPPLIER shall provide unit drawings showing:	

• Dimensions;

		TECHNICAL SPECIFICATION	<sup>№</sup> I-ET-3010.00-5400-947-	P4X-004 REV. B
[ <i>2</i> ] <i>2</i> ]	-	PETROBRA	AS	SHEET: 11 <sub>of</sub> 12
PETROBR.	AS		EQUIPMENT	NP-1
				ESUP
		Weight;		
		• Required polable water now.		
5.3.2	Equ	ipment		
	a)	SUPPLIER shall provide unit acc	cording to specification he	rein.
5.3.3	Insp	ection		
	a)	Emergency shower and eye-w delivery.	vashing unit shall be ins	spected before its
5.4 \$	Stret	cher		
5.4.1	SUF doci	PLIER shall fully comply wit uments listed in item 2.	h requirements in this	specification and
5.4.2	Stre supp	tchers shall be provided, along port to be fixed to the wall.	with all accessories rec	quested for proper
5.4.3	Doc	uments for BID Phase:		
	a)	SUPPLIER shall provide a drawi	ings containing the following	ng information:
		• Dimensions;		
		• Weight.		
	b)	SUPPLIER shall also provide a d	descriptive of the compone	ents materials.
5.4.4	Doc	uments for Delivery Phase		
		<ul> <li>Instructions how to use shall</li> </ul>	be in Brazilian Portuguese	e Language;
		Test Certificates.		
5.4.5	Cert	ificates		
	a)	SUPPLIER shall provide Certific MARINHA - DPC (meaning: E recognized by the origin country	ates of Approval issued b Brazilian Maritime Author responsible institution.	y MINISTÉRIO DA ity) or Certificates
5.5 E	Emer	gency Escape Breathing Devic	e (EEBD)	
5.5.1	Doc	uments		
	a)	SUPPLIER shall provide equipm	nent full specifications such	n as:
		• Dimensions;		
		• Weight;		
		<ul> <li>Materials;</li> </ul>		

	TECHNICAL SPECIFICATION <sup>№</sup> I-ET-3010.00-5400-947-	P4X-004	rev. B			
BR	PETROBRAS	SHEET: 12	of 12			
PETROBRAS		NP-1				
		ESUP				
	<ul> <li>Training and Maintenance Program.</li> </ul>					
5.5.2 Cer	tificates					
<ul> <li>a) EEBD shall be an approved type. SUPPLIER shall provide Certificates of Approval issued by MINISTÉRIO DO TRABALHO (meaning: Brazilian Labor Authority) or Certificates recognized by the origin country responsible institution.</li> </ul>						
6 ANNI	ΞX					
The fo	llowing annex is an example of an EEBD type.					
Dimen	sions are suggestive. SUPPLIER may propose alternati	ve dimens	ion and			
desian	in order to guarantee the proper functioning)					
	· · · · · · · · · · · · · · · · · · ·					
	HOOD OR FACE MASK SHOL	JLDER TRAP				
	CONTENT INDICATOR	10 min NDER				
EXAMPLE (						