	<b>TECHNICAL SPECIFICATION</b>		Nº:	I-ET-3010.00-1200-970-P4X-005		
	CLIENT:	SRGE			SHEET:	1 of 39
	JOB:	BASIC DESIGN				
	AREA:					
SRGE	TITLE: <b>SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING</b>			NP-1		
			ESUP			


**INDEX OF REVISIONS**

REV.	DESCRIPTION AND/OR REVISED SHEETS
0	ORIGINAL

	REV. 0								
DATE	26.08.2022								
DESIGN	EICOM								
EXECUTION	EIW7								
CHECK	U38W								
APPROVAL	EAFZ								


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FORM OWNED TO PETROBRAS N-381 REV. L

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## 1 INTRODUCTION

### 1.1 Objective

- 1.1.1 Present some risk scenarios and necessary minimum safeguards to be considered and provided by the seller during onshore commissioning activities


### 1.2 General


SELLER is responsible to provide all necessary equipment and assistance to make available the safeguards described in each system as per item 1.3


### 1.3 Commissioning risks per system


#### RISK SCENARIOS BY SOP


SOP	DESCRIPTION	RISK SCENARIOS	RISK TREATMENT/SAFEGUARDS
1210	WELL	<ul style="list-style-type: none"> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>	<ul style="list-style-type: none"> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eyewash</li> <li>- Blocking and signaling of the tested pipes</li> <li>- Oil leak mitigation kit.</li> </ul>
1212	CRUDE OIL AND GAS METERING	- N/A	- N/A
1223	PETROLEUM PROCESS	<ul style="list-style-type: none"> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric shock</li> <li>- Electric motors with risk of fire</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> </ul>

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			<ul style="list-style-type: none"> <li>- High voltage (TO/V-TO)</li> </ul>	<ul style="list-style-type: none"> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eyewash</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit.</li> </ul>		
1225	VAPOR RECOVERY	<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of leakage and lubricating oil splashes;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eyewash</li> <li>- Blocking and signaling of the tested pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>			
1231	GAS PROCESSING / HANDLING	<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage;</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- High pressure with risk of leakage and splash of lubricating oil;</li> <li>- SDV/BDV/XV opening and</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment</li> <li>- Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>			


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		closing, SDV/BDV/XV oil spill and splash hazard, SDV and BDV oil leak and splash hazard, oil leak and splash hazard		
1227	GAS DEHYDRATION GDU-1	<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N<sub>2</sub>+He)</li> <li>- High pressure with risk of inert gas leakage;</li> <li>- Electric shock</li> <li>- Hot Fluid (Regeneration)</li> <li>- Handling of heavy material (loading stuffing into the vessels)</li> <li>- Hot Fluid (Regeneration)</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO<sub>2</sub> and/or dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>	
1233	GAS DEHYDRATION GDU-2	<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N<sub>2</sub>+He)</li> <li>- High pressure with risk of inert gas leakage (N<sub>2</sub>+He);</li> <li>- Handling of heavy material (loading stuffing into the vessels)</li> <li>- Toxic fluid handling (TEG)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO<sub>2</sub> and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>	


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1234	H2S REMOVAL	<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- Handling of heavy material (loading stuffing into the vessels)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>				
1235	CO2 REMOVAL	<ul style="list-style-type: none"> <li>- Loading of membranes and inerting;</li> <li>- Electrical panels;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash</li> </ul>	<ul style="list-style-type: none"> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Oil leak mitigation kit</li> </ul>				
1238	HYDROCARBON DEW POINT	<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Handling of heavy material (loading stuffing into the vessels)</li> <li>- Asphyxiating fluid loading (R-134_A)</li> <li>- High pressure with risk of gas leakage (R-134_A);</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>				


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1244	WELL LAUNCHERS PIG	<ul style="list-style-type: none"> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash</li> </ul>	<ul style="list-style-type: none"> <li>- Personal protective equipment</li> <li>- Emergency showers and eye wash;</li> <li>- Oil leak mitigation kit</li> </ul>	
1251	WATER INJECTION	<ul style="list-style-type: none"> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage;</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment</li> <li>- Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>	
1252	GAS INJECTION	<ul style="list-style-type: none"> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage;</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder);</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment</li> <li>- Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> </ul>	


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		<ul style="list-style-type: none"> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>		<ul style="list-style-type: none"> <li>- Alignment for depressurization after test;</li> <li>- Oil leak mitigation kit</li> </ul>		
1254	CO2 INJECTION	<p><b>Compressor</b></p> <ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- High pressure with risk of leakage and lubricating oil splashes;</li> <li>- High pressure with risk of inert gas leakage;</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul> <p><b>Turbine</b></p> <ul style="list-style-type: none"> <li>- Presence of fuel (flammable)</li> <li>- Presence of lubrication system (flammable)</li> <li>- Hot and asphyxiating gases from combustion</li> </ul>		<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization, grounding rod, risk of explosion in panel);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Water Mist System</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - LGE</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eyewash</li> <li>- Personal protective equipment - Clothing</li> <li>- Identification of hot parts;</li> <li>- Personal protective equipment - Self-contained breathing apparatus</li> <li>- Oil leak mitigation kit</li> </ul>		
1261	CHEMICAL INJECTION FOR OIL AND GAS	<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- High pressure with risk of inert gas leakage;</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> </ul>		<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> </ul>		





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				<ul style="list-style-type: none"> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>	<ul style="list-style-type: none"> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>		
1262	CHEMICAL INJECTION FOR OILY WATER		<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage;</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- SDV/BDV/XV opening and closing, SDV/BDV/XV oil spill and splash hazard, SDV and BDV oil leak and splash hazard</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>			
1263	CHEMICAL INJECTION FOR INJECTION WATER / SEA WATER		<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- High pressure with risk of inert gas leakage;</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>			


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			SDV/BDV/XV, risk of leakage and oil splash			
1353	HELIDECK		<ul style="list-style-type: none"> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Test of the LGE system (toxic or corrosive fluid)</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eye wash</li> </ul>		
1357	MOORING		<ul style="list-style-type: none"> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash</li> <li>- Risk of cable breakage (winch)</li> </ul>	<ul style="list-style-type: none"> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Oil leak mitigation kit</li> </ul>		
1358	CARGO TANKS, CARGO PUMPS AND VOID SPACES		<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric motors with risk of fire;</li> <li>- Electric shock;</li> <li>- Electrical panels with risk of explosion in panel;</li> <li>- Risk of water leakage in the tests.</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Oil leak mitigation kit</li> </ul>		
1359	OFFLOADING AND TELEMETRY		<ul style="list-style-type: none"> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric motors with risk of fire</li> <li>- Explosion risk electrical panels</li> <li>- Compressed air cannon (line)</li> <li>- Risk of cable breakage (winch)</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Oil leak mitigation kit</li> </ul>		


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1522	WELL LAUNCHERS AND RECEIVERS	PIG AND	<ul style="list-style-type: none"> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>	<ul style="list-style-type: none"> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment</li> <li>- Emergency showers and eyewash</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Oil leak mitigation kit</li> </ul>			
5111	SEA WATER		<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting,</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment</li> <li>- Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>			

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SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING				ESUP			
5115	FRESH WATER	<ul style="list-style-type: none"> <li>- System located in room/compartament in the hull</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>				
5121	POTABLE WATER	<ul style="list-style-type: none"> <li>- System located in room/compartament in the hull</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- SDV/BDV/XV opening and closing, SDV/BDV/XV oil spill and splash</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> </ul>				


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		AREA:				SHEET 13 of 39
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					ESUP	
		<p>hazard, SDV or XV oil leak and splash hazard, oil leak and splash hazard</p>			<ul style="list-style-type: none"> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>	
5121	HYPOCHLORITE INJECTION	<ul style="list-style-type: none"> <li>- System located in room/compartiment in the hull</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- SDV/BDV/XV opening and closing, SDV/BDV/XV oil spill and splash hazard, SDV or XV oil leak and splash hazard, oil leak and splash hazard</li> </ul>			<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>	
5121	HULL MARINE GROWTH PROTECTION SYSTEM	<ul style="list-style-type: none"> <li>- System located in room/compartiment in the hull</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>			<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> </ul>	


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		AREA:				SHEET 14 of 39	
		<b>SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING</b>				NP-1	
						ESUP	
5122	FRESH WATER MAKER			<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>		
5122	FRESH WATER MAKER FOR DILUTION			<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> <li>- Electric shock</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization, grounding rod, risk of explosion in panel);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> </ul>		


 <b>PETROBRAS</b>		TECHNICAL SPECIFICATION	Nº:	I-ET	REV.	
		AREA:				SHEET
		TITLE:	SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING			15 of 39
					NP-1	
					ESUP	
		<ul style="list-style-type: none"> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>		<ul style="list-style-type: none"> <li>- Personal protective equipment</li> <li>- Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>		
5124	COOLING WATER	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splashes</li> </ul>		<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and bar with hook);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment</li> <li>- Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>		
5125	HOT WATER	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Risk of burning with hot fluid</li> </ul>		<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> </ul>		


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		TITLE:				NP-1	
		SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING				ESUP	
				<ul style="list-style-type: none"> <li>- WHRU (5147) - Risk of high pressure if there is trapped water.</li> </ul>		<ul style="list-style-type: none"> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment</li> <li>- Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>	
5133.1	DIESEL			<ul style="list-style-type: none"> <li>- System located in room/compartament in the hull - High pressure with risk of leakage and oil splash;</li> <li>- Presence of lubricating oil and/or with (flammable) with possibility of leakage with combustion;</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>		<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)"</li> <li>- Fixed firefighting systems - Water Mist System</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - LGE</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eyewash</li> <li>- Oil leak mitigation kit</li> </ul>	
5133.2	WELL PUMP SERVICE			<ul style="list-style-type: none"> <li>- System located in room/compartament in the hull</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric shock</li> </ul>		<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> </ul>	




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		AREA:				SHEET	17 of 39
		TITLE:	SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING			NP-1	ESUP
			<ul style="list-style-type: none"> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Oil leak mitigation kit</li> </ul>			
5134	COMPRESSED AIR	<ul style="list-style-type: none"> <li>- Presence of lubricating oil and/or with (flammable) with possibility of leakage with combustion;</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> </ul>				
5135	FUEL GAS	<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- Risk of leakage of asphyxiating fluid</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Blocking and signaling of the tested circuit pipes</li> </ul>				


 <b>PETROBRAS</b>		TECHNICAL SPECIFICATION	Nº: I-ET	REV.	
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		TITLE: <b>SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING</b>			NP-1
				ESUP	
				- Alignment for depressurization after test	
5138	START UP AIR	<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- Presence of lubricating oil and/or with (flammable) with possibility of leakage with combustion;</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>		
5139.1	HYDRAULIC POWER UNIT- Vessel	<ul style="list-style-type: none"> <li>- High pressure, with risk of leaking and squirting hydraulic oil</li> <li>- Presence of oil (flammable) with possibility of leakage with combustion;</li> <li>- Toxic fluid</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - LGE</li> <li>- Cabinets of materials for fire fighting</li> <li>- Oil leak mitigation kit</li> </ul>		
5139.2	HYDRAULIC POWER UNIT- Topside	<ul style="list-style-type: none"> <li>- High pressure, with risk of leaking and squirting hydraulic oil</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> </ul>		


 <b>PETROBRAS</b>		<b>TECHNICAL SPECIFICATION</b>	Nº: I-ET	REV.
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<b>SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING</b>			<b>NP-1</b>	
			<b>ESUP</b>	
		<ul style="list-style-type: none"> <li>- Presence of oil (flammable) with possibility of leakage with combustion;</li> <li>- Toxic fluid</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - LGE</li> <li>- Cabinets of materials for fire fighting</li> <li>- Oil leak mitigation kit</li> </ul>	
5139.3	HYDRAULIC POWER UNIT- Subsea	<ul style="list-style-type: none"> <li>- High pressure, with risk of leaking and squirting hydraulic oil</li> <li>- Presence of oil (flammable) with possibility of leakage with combustion;</li> <li>- Toxic fluid</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - LGE</li> <li>- Cabinets of materials for fire fighting</li> <li>- Oil leak mitigation kit</li> </ul>	

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		TITLE:			NP-1	
			SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING		ESUP	
5143	NORMAL ELECTRICAL DISTRIBUTION	<ul style="list-style-type: none"> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> </ul>	<ul style="list-style-type: none"> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)               <ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> </ul> </li> <li>- Rubber floor for electrical panel testing;</li> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> </ul>			
5145	NORMAL LIGHTING	<ul style="list-style-type: none"> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> </ul>	<ul style="list-style-type: none"> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)               <ul style="list-style-type: none"> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> </ul> </li> <li>- Rubber floor for electrical panel testing;</li> </ul>			
5147	ELECTRICAL TURBO GENERATOR (GTG - Gas Turbine Generator)	<ul style="list-style-type: none"> <li>- System located in room/compartiment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Presence of fuel (flammable)</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- Presence of lubricating oil with potential for leakage and possibility of contact with skin and eyes;</li> <li>- Hot and asphyxiating gases from combustion</li> <li>- Risk of burning with hot fluid and/or hot parts of the turbine and/or engines</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Fixed firefighting systems - Water Mist System</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - LGE</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eyewash</li> </ul>			

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		TITLE: SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING		NP-1
			<ul style="list-style-type: none"> <li>- Personal protective equipment - Clothing;</li> <li>- Identification of hot parts;</li> <li>- Check the presence of people inside the HOOD before activating the equipment, as well as the presence of fuel residues and cleaning of the place.</li> <li>- Check and remove temporary filters or mesh (mesh) used for oil flushing before starting the machines.</li> <li>- Keep firefighters on standby following the test.</li> </ul>	
5148	ESSENTIAL ELECTRICAL DISTRIBUTION	<ul style="list-style-type: none"> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> </ul>	<ul style="list-style-type: none"> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Temporary lighting,</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> </ul>	
5149	ESSENTIAL LIGHTING	<ul style="list-style-type: none"> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> </ul>	<ul style="list-style-type: none"> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization, grounding rod, risk of explosion in panel);</li> <li>- Rubber floor for electrical panel testing;</li> </ul>	
5241.1	INERT GAS for Cargo Tanks blanketing	<ul style="list-style-type: none"> <li>- Risk of leakage of asphyxiating fluid</li> <li>- Risk of leakage and splashing of diesel oil (Fuel);</li> <li>- Presence of diesel oil (flammable) with possibility of leakage with combustion;</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> </ul>	


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		SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING				ESUP	
						<ul style="list-style-type: none"> <li>- Rubber floor for electrical panel testing;</li> </ul>	
5241.2	N2 GENERATOR FOR PROCESS PLANT	<ul style="list-style-type: none"> <li>- Risk of leakage of asphyxiating fluid;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric shock;</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> </ul>				
5241.3	N2 Generator for Flare system	<ul style="list-style-type: none"> <li>- Risk of leakage of asphyxiating fluid;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric shock;</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Oil leak mitigation kit</li> </ul>				
5251	VENTILATION	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> </ul>				

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<b>TITLE: SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING</b>			NP-1	
			ESUP	
5252	AIR CONDITIONING	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage (N2+He);</li> <li>- High pressure with risk of leakage and splashing of water</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>	
5261	ELECTRICAL EMERGENCY GENERATOR	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Presence of fuel (flammable)</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- Presence of lubricating oil with potential for leakage and possibility of contact with skin and eyes;</li> <li>- Hot and asphyxiating gases from combustion</li> <li>- Risk of burning with hot fluid and/or hot parts of the</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Water Mist System</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - LGE</li> <li>- Cabinets of materials for fire fighting</li> </ul>	


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		TITLE:	SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING			NP-1	ESUP
		turbine and/or engines - Risk of suffocation in the room (if doors and dampers closed)			- Personal protective equipment - Emergency showers and eyewash - Personal protective equipment - Clothing; - Identification of hot parts; - Keep firefighters on standby following the test.		
5262	ELECTRICAL AUXILIARY GENERATOR	- System located in room/compartment in the hull - Electricity generation and/or room with electrical panels (risk with electricity) - Presence of fuel (flammable) - Presence of lubricating oil (flammable) with possibility of leakage with combustion; - Presence of lubricating oil with potential for leakage and possibility of contact with skin and eyes; - Hot and asphyxiating gases from combustion - Risk of burning with hot fluid and/or hot parts of the turbine and/or engines - Risk of suffocation in the room (if doors and dampers closed)			- Temporary lighting; - Demarcated and unobstructed escape route - Unobstructed emergency doors - Autonomous breathing equipment; - Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick); - Rubber floor for electrical panel testing; - Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder) - Cabinets of materials for fire fighting - Portable firefighting systems - LGE - Cabinets of materials for fire fighting - Personal protective equipment - Emergency showers and eyewash - Personal protective equipment - Clothing; - Identification of hot parts; - Autonomous breathing equipment; - Keep firefighters on standby following the test.		
5262	ELECTRICAL HULL GENERATOR 6.6 KV 7MW	- System located in room/compartment in the hull - Electricity generation and/or room with electrical panels (risk with electricity) - Explosion risk electrical panels			- Temporary lighting; - Demarcated and unobstructed escape route - Unobstructed emergency doors - Autonomous breathing equipment; - Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick); - Rubber floor for electrical panel testing; - Portable firefighting systems - Fire extinguishers		





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<b>SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING</b>			NP-1	
			ESUP	
			(CO2 and/or dry chemical powder) - Personal protective equipment - Clothing;	
5263	UPS for EMERGENCY LIGHTING	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosive atmosphere</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> <li>- Personal protective equipment - Emergency showers and eyewash</li> </ul>	
5264	TELECOMMUNICATION POWER	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization, grounding rod, risk of explosion in panel);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>	


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		TITLE:				NP-1	
		SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING			ESUP		
5265	DIRECT CURRENT AND UPS	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment</li> <li>- Self-contained breathing apparatus</li> <li>- Personal protective equipment - Clothing;</li> <li>- Personal protective equipment</li> <li>- Emergency showers and eyewash</li> </ul>				
5266	CARGO HANDLING	<ul style="list-style-type: none"> <li>- Electric motors with risk of fire</li> <li>- Hoses handling</li> </ul>	<ul style="list-style-type: none"> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> </ul>				
5267	CATHODIC PROTECTION	<ul style="list-style-type: none"> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Access to Cathodes from inside the tank (confined space)</li> </ul>	<ul style="list-style-type: none"> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route;</li> <li>- Autonomous breathing equipment;</li> </ul>				
5268	PULL IN / PULL OUT STATION	<ul style="list-style-type: none"> <li>- Risk of possible breakage of cables;</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Isolation of test and adjacent areas;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> </ul>				

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		SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING			ESUP	
5269	EMERGENCY ELECTRICAL DISTRIBUTION	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting,</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>			
5271	CARGO TANK CLEANING AND RECIRCULATION	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric motors with risk of fire</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Risk of water leakage in tests</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> </ul>			
5310	SEWAGE	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric motors with risk of fire</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Risk of water leakage in tests</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Oil leak mitigation kit</li> </ul>			

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<b>SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING</b>		TITLE:		
		NP-1		ESUP
5331	PRODUCED WATER TREATMENT	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of inert gas leakage;</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- High pressure with risk of leakage and splashing of toxic/corrosive fluid (Chemical Injection and CIP)</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash.</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Personal protective equipment - Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>	
5335	BALLAST	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric motors with risk of fire</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Risk of water leakage in tests</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Oil leak mitigation kit</li> </ul>	


 <b>PETROBRAS</b>		TECHNICAL SPECIFICATION	Nº:	I-ET	REV.		
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					ESUP		
5336	DRAINAGE / SLOP (OPEN DRAIN)	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric motors with risk of fire</li> <li>- Electric shock</li> <li>- Risk of water leakage in tests</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> </ul>				
5336	DRAINAGE / SLOP (CLOSED DRAIN)	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric motors with risk of fire</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Risk of water leakage in tests</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Oil leak mitigation kit</li> </ul>				
5412	FLARE and FGRS	<ul style="list-style-type: none"> <li>- Pressure Test (Leak test with N2+He)</li> <li>- High pressure with risk of leakage and lubricating oil splashes;</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- Opening and closing of SDV/BDV/XV, risk of leakage and oil splash;</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> </ul>				


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			<ul style="list-style-type: none"> <li>- Personal protective equipment</li> <li>- Emergency showers and eye wash;</li> <li>- Blocking and signaling of the tested circuit pipes</li> <li>- Alignment for depressurization after test</li> <li>- Oil leak mitigation kit</li> </ul>	
5415	ATMOSPHERIC VENT	- N/A	- N/A	
5423	FIREFIGHTING WATER	<p><b>Firefighting</b></p> <ul style="list-style-type: none"> <li>- High pressure with risk of leakage and water splashes;</li> </ul> <p><b>Combustion engine</b></p> <ul style="list-style-type: none"> <li>- Presence of lubricating oil and/or with (flammable) with possibility of leakage with combustion;</li> <li>- Presence of fuel (flammable)</li> <li>- Presence of lubricating oil with potential for leakage and possibility of contact with skin and eyes</li> <li>- Hot and asphyxiating gases from combustion</li> <li>- Risk of burning with hot fluid and/or hot parts of the turbine and/or engines</li> </ul> <p><b>Firefighting pump</b></p> <ul style="list-style-type: none"> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Electric shock</li> <li>- Electric motors with risk of fire jockey pump</li> <li>- High pressure with risk of leakage and water splashes;</li> <li>- Electric shock</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Fixed firefighting systems - Water Mist System</li> <li>- Fixed firefighting systems - Hydrants (Even if temporary) (Recommended practice)</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - LGE</li> <li>- Cabinets of materials for fire fighting</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eyewash</li> <li>- Personal protective equipment - Clothing;</li> <li>- Identification of hot parts;</li> <li>- Oil leak mitigation kit</li> </ul>	


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		TITLE:				NP-1	
		SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING			ESUP		
5424	FIREFIGHTING FOAM	<ul style="list-style-type: none"> <li>- Risk of leakage and splashing of toxic or corrosive fluid</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Personal protective equipment - Emergency showers and eyewash</li> <li>- Oil leak mitigation kit</li> </ul>				
5425	FIREFIGHTING INERT GAS	<ul style="list-style-type: none"> <li>- Risk of leakage of asphyxiating fluid</li> <li>- High pressure with risk of leakage of inert gas (CO2);</li> <li>- Risk of breakage of locks and hinges of the doors of the rooms</li> <li>- Inadvertent triggering in rooms protected by the system;</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting,</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Use Petrobras procedure PE-2SRG-00373;</li> </ul>				
5428	FIREFIGHTING PORTABLE EQUIPMENT	- N/A	- N/A				
5431	LIFE SAVING	- N/A	- N/A				
5511	TELECOMMUNICATION SPECIALIZED	<ul style="list-style-type: none"> <li>- System located in room/compartament in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and bar with hook);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>				


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			ESUP			
5512	TELECOMMUNICATI ON TRANSMISSION	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>			
5513	VIDEOCONFERENC E	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>			
5514	CLOSED-CIRCUIT TELEVISION (CCTV)	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization, grounding rod, risk of explosion in panel);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>			




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5515	OPERATIONAL RADIO	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>	
5516	TELECOMMUNICATION VOICE	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>	
5517	TELECOMMUNICATION DATA	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>	


 <b>PETROBRAS</b>		TECHNICAL SPECIFICATION	Nº:	I-ET	REV.	
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		SAFETY REQUIREMENTS FOR ONSHORE COMMISSIONING			ESUP	
5518	PUBLIC ADDRESS AND GENERAL ALARM (PAGA)	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>			
5521	ENVIRONMENTAL MONITORING	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Self-contained breathing apparatus</li> <li>- Personal protective equipment - Clothing;</li> </ul>			
5522	FIRE AND GAS DETECTION	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> </ul>			

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		NP-1		ESUP
				<ul style="list-style-type: none"> <li>- Personal protective equipment - Clothing;</li> </ul>
5523	AUTOMATION / SUPERVISION AND OPERATION CONTROL	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>		<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>
5524	SUBSEA / RESERVOIR MONITORING	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>		<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>
5529	RISER MONITORING	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>		<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> </ul>

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				<ul style="list-style-type: none"> <li>- Personal protective equipment - Clothing;</li> </ul>
5537	POSITIONING	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>	
5590	TELEVISION (TV)	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting,</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>	
5591	AUTOMATION NETWORK	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> </ul>	

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						<ul style="list-style-type: none"> <li>- Personal protective equipment - Clothing;</li> </ul>	
6410	FILLING STATION	<ul style="list-style-type: none"> <li>- Storage of flammable material</li> <li>- Electric shock</li> <li>- Explosion risk electrical panels</li> <li>- Electric motors with risk of fire</li> </ul>	<ul style="list-style-type: none"> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>				
8215	HOSPITAL	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> </ul>				
8217	COMMUNICATION CENTRAL STATION	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Explosion risk electrical panels</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)</li> <li>- Personal protective equipment - Clothing;</li> </ul>				
8221	CENTRAL CONTROL ROOM	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull</li> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> </ul>				

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						<ul style="list-style-type: none"> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)               <ul style="list-style-type: none"> <li>- Personal protective equipment - Clothing;</li> </ul> </li> </ul>	
8224	MAINTENANCE WORKSHOP	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull               <ul style="list-style-type: none"> <li>- Electricity generation and/or room with electrical panels (risk with electricity)</li> <li>- Machine tools</li> <li>- Explosion risk electrical panels</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)               <ul style="list-style-type: none"> <li>- Personal protective equipment - Clothing;</li> </ul> </li> </ul>				
8226	WAREHOUSE	<ul style="list-style-type: none"> <li>- System located in room/compartment in the hull               <ul style="list-style-type: none"> <li>- Storage of flammable material</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Temporary lighting;</li> <li>- Demarcated and unobstructed escape route</li> <li>- Unobstructed emergency doors</li> <li>- Autonomous breathing equipment;</li> <li>- Where there is an electrical panel - (PPE suitable for intervention, energy isolation and de-energization and grounding stick);</li> <li>- Rubber floor for electrical panel testing;</li> <li>- Portable firefighting systems</li> <li>- Fire extinguishers (CO2 and/or dry chemical powder)               <ul style="list-style-type: none"> <li>- Personal protective equipment - Clothing;</li> </ul> </li> </ul>				
N/A	ON SHORE N2/He LEAK TEST	<ul style="list-style-type: none"> <li>- Pressure test               <ul style="list-style-type: none"> <li>- The maintenance of pressurized lines for the offshore stage must be clearly identified throughout the pressurization time</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Recommendations regarding pressure tests, signaling of tested circuits, isolation of adjacent areas must be taken into account, as well as test execution times must be compatible with the lowest flow of people in the vicinity;</li> <li>- Blocking and signaling of the pipes of the tested circuit;</li> <li>- Alignment for depressurization after test</li> </ul>				

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			<b>ESUP</b>	
N/A	HYDRAULIC AND LUBE OIL SYSTEMS FLUSHING	<ul style="list-style-type: none"> <li>- Pressure test</li> <li>- Give correct destination and treatment of the oil used in the activity</li> <li>- Presence of lubricating oil (flammable) with possibility of leakage with combustion;</li> <li>- Presence of lubricating oil with potential for leakage and possibility of contact with skin and eyes;</li> </ul>	<ul style="list-style-type: none"> <li>- Recommendations regarding pressure tests, signaling of tested circuits, isolation of adjacent areas must be taken into account, as well as test execution times must be compatible with the lowest flow of people in the vicinity;</li> <li>- Portable firefighting systems - Fire extinguishers (CO2 and dry chemical powder)</li> <li>- Personal protective equipment - Emergency showers and eyewash</li> <li>- Blocking and signaling of the pipes of the tested circuit;</li> <li>- Alignment for depressurization after test</li> </ul>	