



Exploration & Production

GENERAL SPECIFICATION

SUBSEA SYSTEMS

GS SPS 010

Preservation requirements for subsea package

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1. Scope

The purpose of this specification is to describe:

- General requirements for the preservation of subsea equipment during shipment, handling, transportation and storage
- Conditions and instructions for storage
- Preventive maintenance for preservation of equipment during storage.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	



Total General Specifications

Reference	Title
GS SPS 001	Design philosophy and requirements for Subsea Stations

3. Definitions

3.1 General preservation

Protection of the equipment and units during shipment, handling, transportation and storage.

3.2 Initial preservation

Initial application of protection and coating carried out by SUPPLIER, to maintain the equipment unimpaired.

3.3 Preservation maintenance

Periodic maintenance to keep the initial preservation intact and maintained in accordance with COMPANY and SUPPLIER preservation requirements.

3.4 Preservation records

The preservation records form the basis for documentation during all phases of the project including the standard preservation maintenance, for each of the three main disciplines (mechanical, electrical and instrumentation).

3.5 Preservation labels

Appropriate preservation labels shall be attached to equipment, clearly visible, signed with date of preservation action.

4. Documentation

4.1 Preservation record

The preservation records shall document that preservation is performed in accordance with project's requirements.

Standard preservation maintenance check list will be established by SUPPLIER and proposed to COMPANY for acceptance.

Preservation record forms shall be proposed by SUPPLIER for COMPANY's acceptance

4.2 List of specific preservation maintenance requirements

This list shall be established by SUPPLIER for the three main disciplines (mechanical, electrical, instrumentation).

This list should include a preservation maintenance plan.

4.3 Preservation documentation

The SUPPLIER shall be responsible for providing the final issue of Preservation Documentation to COMPANY when all initial preservation activities are completed.

The Preservation Documentation shall include:

- Preservation records
- Tagged equipment list per package
- Toxicological data sheet for preservation products being used
- SUPPLIER specific or extra preservation maintenance list
- Procedure for removal of preservation products used and recommendations for disposal
- Procedure for packing of equipment
- Maintenance frequency for specific or extra preservation requirements
- Instructions for preservation during the different phases of project
- Specific control activities on electrical items.

5. Preservation requirements

5.1 General requirements

Preservation shall be based on equipment SUPPLIER preservation instructions agreed by COMPANY.

Initial preservation shall be based on outdoor storage under the applicable Project environmental conditions agreed with COMPANY.

Packing of equipment for transportation shall protect the equipment against humidity, dust and mechanical constraints which may occur during storage, loading and unloading operations.

5.2 General instructions prior shipment

All skids, equipment and others materials shall be clean, dry, dust free, without any corrosion before initial preservation and transportation.

If for any reason, the equipment has been immersed in sea water (in particular during a shallow water test), the equipment shall be washed, including internal bores, with fresh water to remove all traces of salt. Specific care shall be taken with stainless steel components.

All equipment shall be drained and lubricated with adequate products prior to storage or shipment.

Exposed metallic surfaces shall be protected with a rust preventative protection inline with the Project transport and storage environmental conditions.

Exposed sealing surfaces shall be protected from mechanical damage and corrosion.

Prior to release all in/outlets from units/packages/skids shall be plugged/blanked. Unless otherwise stated, flanges shall be blanked with oil resistant rubber gaskets and steel or resistant plywood plate with treated bolts to provide a mechanical protection and to avoid entrance of water or dust. Threaded openings shall have adequate metal or plastic plugs. Nipples shall be lubricated and protected.



For equipment not to be immersed, protect all glasses of instruments or panels with plywood plate or others. Install wooden frame on the front panel to protect corners and panel.

All pressure gauges, controllers, panels, junction boxes, temp. Instruments, telecom. equipment, detectors, transmitters, heaters, pushbutton, connection boxes, etc., shall be correctly protected.

For non metallic sealing materials (in particular elastomer), the ageing control procedures and protection shall be documented by SUPPLIER with specified requirements including provisions for storage, temperature and natural light exposition, contact with liquids, ozone and radiographic damage.

All ball valves shall be locked in open position.

Valves and bores should be filled with suitable inhibitor to prevent corrosion of internals.

For low temperature storage conditions, valves cavities should be filled after testing with antifreezing (-30°C) mixture.

All equipment with internals, mechanical systems (valves, etc.) shall be covered with watertight tape properly applied.

All valves spindles exposed shall be covered with adequate tape.

5.3 Instructions for electrical and electronic equipment

All electrical and electronic equipment exposed to humidity shall be protected with silica gel, vapour corrosion inhibitor or equivalent, according to MANUFACTURER's recommendations.

Insulation resistance of all electrical equipment (motors, heaters, generators, transformers, etc.) shall be measured prior to storage. The results of measurements shall be recorded on electrical preservation record forms.

SUPPLIER shall produce specific instructions for proper storage and shipment of all electrical or electronic equipment or components (in particular cables and connectors).

5.4 Instructions for instrument equipment

Instrument equipment containing electronics shall be protected with vapour corrosion inhibitor or equivalent, according to MANUFACTURER's recommendations.

All hydraulic or pneumatic lines shall be flushed and filled and/or drained in accordance with SUPPLIER's written specification.

In particular for these lines:

- Bleed all gas and pressurised hydraulic circuits to zero PSIG
- Bleed the gas pre-charge of all accumulators to zero PSIG
- Drain the hydraulic control fluid from the reservoir
- Disconnect all inlet and outlet connections
- Cap all connections

Exposed hydraulic or pneumatic end fittings shall be capped or plugged.

Gaskets or O-rings on instrument equipment shall be greased with a suitable lubricant or protection product.



5.5 Instructions for mechanical equipment

Bolts used for temporary blinds shall not cause corrosion on equipment and shall be made from suitable material or with adequate treatment.

All exposed unpainted surfaces shall be protected with a suitable product for preservation.

All bearings shall be greased according to SUPPLIER instructions.

Thermal insulation of units or equipment exposed to damage during storage installation, shall be protected with plywood plates.

Sensitive equipment shall be protected by vapour corrosion inhibitor.

5.6 Instructions for Piping

All small and large bore piping must be preserved with suitable products.

6. Preventive preservation maintenance

6.1 Routine preventive preservation maintenance

Carry out regularly a thorough visual inspection of equipment to verify the status of preservation (particularly look for damaged components, structural damage, coating damage, etc., and for corrosion, cleanliness and moisture).

Check for loose or damaged components, abnormal observations and state of preservatives.

Report any defects found.

Repair any damage on the equipment (in particular damage to the painted surfaces).

Update the equipment preservation label and records.

6.2 Specific preventive preservation maintenance for equipment in storage

For long term storage, specific preservation maintenance of some equipment may be necessary. The specific maintenance program could cover:

- Hydraulic test
- Torque test of valve
- Function test for mechanical equipment
- Inhibitor products replacement
- Insulation resistance measurement
- Pump test
- Etc.

The preservation labels and records shall be completed for each specific maintenance action.

6.3 Preparation for offshore installation

SUPPLIER shall produce proper documentation for the following operations as a minimum:

- Removal of the protective covers used for preservation and storage



- Visual inspection of equipment - report and repair, if necessary, any defects found
- Cleaning of preservatives
- Verification of all connection surfaces or bores
- Verification of electrical continuity between equipment, units, pipes, structures, support, etc., for cathodic protection purposes
- Verification of all lifting points.