

Handling, Storage and Preservation Procedure

HBR-GBR-HSE-PRC-0028

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Function:	Health, Safety, Environment & Security
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MANAGEMENT OF CHANGE (MOC) FORM

To be completed by the Originator/Owner.

Description			
Type of change	☐ New ☒ Revise ☐ Retire		
BU/hub/asset(s) impacted	☐ All ☐ Indonesia ☐ Mexico ☐ Norway ☐ Vietnam ☒ UK ☐ London ☐ Hub/asset-specific: N/A		
Document scope/ Justification for change	New document to define the minimum Harbour Energy requirements, expectations, and relevant controls to ensure that all Harbour Energy procured equipment and materials are suitably packaged, handled and transported in a manner that maintains their integrity and functionality.		
Document reviewers required (if applicable)	John Simpsons3		
Note: Include reviewers from all functions. Global documents to include reviewers from all applicable BUs.	Scott Doxford		
Change Assessment and Rollout Requirements			
Is there a technical MOC or a Synergi action associated with the document?	☐ Yes ☒ No	If yes, Technical MOC/ Synergi number:	N/A
Criticality	Change Assessment	Rollout Method	Mechanism
☐ High	Significant change with safety and regulatory impact. This may be a safety critical document, a new document or process, or a significant update to existing ways of working.	Tailored and targeted rollout (e.g. workshops, site presentations), as well as e-mail rollout. Rollout to be completed before publishing on the BMS.	Owner and/or BMS rollout support team
☐ Medium	Significant change with non-safety/non-regulatory impact. The significance of the changes is enough to require the completion of a communication output (e.g. an e-mail) but not necessarily any additional training.	E-mail with supporting material to facilitate rollout (e.g. PowerPoint slides) to raise awareness and assist understanding of the changes made.	Owner and/or BMS rollout support team
☒ Low	Changes on the content of controls with no major impact on the business. Format or edit only changes; straight BMS migration process.	E-mail summary/explanation.	Owner
Notes: 1. Refer to BMS User Procedure, HBR-GLO-ASR-PRC-0001 impact level assessment. 2. Harbour Energy risk assessment criteria apply. 3. For high criticality UK documents and documents with operational impact, the Owner should plan the rollout with the BMS rollout support team.			

REVISION CHANGE NOTICES

Rev	Date	Location of Change	Brief Description of Change
1	30 June 2023	Throughout.	Issued by Harbour Energy as part of the Harbour Energy BMS Integration Project.
2	07 July 2023	Section 6.8	Updated to reflect collaboration feedback relating to Valve preservation and storage. 05 September 2024 – Document Control Action References updated.

DISTRIBUTION

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Note: In addition to those with roles and responsibilities within the document, consider Technical Authorities, HSES focal points, offshore roles, etc. For Global documents, include the applicable BU Functional Authorities.

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Note: Reserved for emergency documentation (e.g. ERPs, OPEPs, etc.) and Safety Cases.

No	Company or Harbour Energy BU/Hub/Asset	Position/Name	Address

CONTENTS

1.0	PURPOSE	5
2.0	SCOPE	5
2.1	Deviation	5
3.0	GLOSSARY OF TERMS	5
3.1	Abbreviations	5
3.2	Definitions	6
4.0	ROLES AND RESPONSIBILITIES	7
4.1	Nominated Responsible Engineer	7
4.2	Buyer	7
4.3	Harbour Energy Quality Team	7
4.4	Quality & Assurance Manager	8
4.5	Technical Authority Team	8
4.6	Contractor (Supplier or Fabricator)	8
4.7	Contractor Warehouse/Stores Personnel	9
5.0	INTRODUCTION	9
5.1	Implementation Timeframes for Warehouse and Storage Facilities	10
6.0	GENERAL REQUIREMENTS	10
6.1	Supplier Quality Surveillance	10
6.2	Handling	11
6.3	Preservation of Equipment Prior to Packaging	11
6.4	Packaging	11
6.5	Shipping	12
6.6	Goods Receipt Inspection at Warehouse/Stores/Quayside Facilities	12
6.7	Preservation	12
6.8	Storage	13
7.0	SPECIFIC EQUIPMENT AND MATERIALS REQUIREMENTS	14
7.1	Pipes/Fabricated Spools/Tubulars	14
7.2	Valves	15
7.3	Gaskets, Bolts and Nuts	16
7.4	Mechanical Seals/Elastomers	16
7.5	Electrical Equipment	17
7.6	Instrumentation	18
7.7	Flexible Hose Assemblies	18
7.8	Dangerous Substances (Liquid or Solid)	18
8.0	AUDIT	18
9.0	REFERENCES	19

1.0 PURPOSE

This Procedure ensures that all procured Harbour Energy equipment, consumables and materials are:

- Suitably packaged, handled and transported in a manner that maintains their integrity and functionality
- Stored and preserved in a manner that prevents deterioration or damage prior to use on Harbour Energy assets

2.0 SCOPE

This Procedure applies to the Harbour Energy North Sea Business Unit.

This Procedure shall be used by relevant Harbour Energy personnel when ordering/procuring new equipment and materials. In addition, this Procedure shall be made available to warehouse/storage facilities) where it should be used as guidance in order to communicate relevant Company quality management aspects, requirements and expectations relating to handling, storage and preservation of Company property at such facilities.

2.1 Deviation

In this Procedure, each requirement that uses the term 'shall' is mandatory and must be satisfied. If a business area is unable to comply with any such mandatory requirement, a request for a dispensation must be approved by the Owner of this Procedure according to the dispensation requirements set out in BMS Document Dispensations Procedure, HBR-GLO-ASR-PRC-0003 [Ref 1].

3.0 GLOSSARY OF TERMS

3.1 Abbreviations

CONEM	Control of New Equipment and Materials
E&C	Engineering and Construction
EPCI	Engineering, Procurement, Construction and Installation
FHA	Flexible Hose Assembly
MSDS	Material Safety Data Sheet
OCTG	Oil Country Tubular Goods
PO	Purchase Order
QA	Quality Assurance
QC	Quality Control
RFQ	Request for Quotation
SIN	Service Improve Notice
SQS	Supplier Quality Surveillance
SWL	Safe Working Load

TDT	Technical Delivery Terms
UN	United Nations

3.2 Definitions

Handling	A process used throughout the entire chain of physical movement or storage of goods.
Initial Preservation	The performance of preparation and application of specified preservatives and fitting of specified protection to any products and equipment, prior to transfer to subsequent phases, to maintain the integrity and condition of the equipment/system.
Long-term Storage	Goods stored in excess of 12 months.
May	A suggestion or consideration.
Packaging	Process of designing, evaluating, and producing packaging for protecting products for distribution, and during transportation, handling, and storage.
Preservation	The protection and/or maintenance of protection carried out on products and equipment prior to utilisation for intended purpose.
Preservation Maintenance	The periodic activities to ensure that the initial preservation is intact and functioning. This also includes repair of deteriorated initial preservation.
Preservation Program	A computerised program which identifies the preservation requirements and the last and the next date for preservation based on periodic intervals for the equipment.
Preservation Record	The document, checklist or form that records the preservation information, requirements, and activities.
Quality Team	Dedicated Harbour Energy Quality professionals within the HSES Assurance function. The team are also embedded with relevant parts of Harbour Energy including Wells, Modifications and Projects.
Shall	A mandatory requirement.
Should	A recommendation. If not followed, alternatives must satisfy the original intent.
Storage	The action or method of storing something for future use.
Supplier Quality Surveillance	SQS activities are QA/QC intervention activities that suppliers and sub-suppliers use to continuously monitor and verify the status of their products to ensure they meet the requirements of Harbour Energy.
Technical Authority (TA)	A person delegated by the accountable manager to make decisions to safeguard the technical aspects of the facilities, within their approval level of competence and responsibilities.
Warehouse/Stores	Third-party storage provider facilitates the use of their buildings and external laydown areas where materials, equipment/or manufactured goods may be handled, preserved, and stored for nominated periods of time before their export or distribution.

4.0 ROLES AND RESPONSIBILITIES

4.1 Nominated Responsible Engineer

Note: *This can be filled by either Harbour Energy and/or Engineering and Construction (E&C)/Engineering, Procurement, Construction and Installation (EPCI) Contractor personnel.*

The nominated Responsible Engineer is responsible for:

- Ensuring that relevant aspects associated with packaging and preserving their procured packages, equipment and materials are managed in accordance with this Procedure
- Ensuring that relevant packaging and preservation requirements are communicated to contractors/suppliers, and that where applicable, provisions are in place to review and verify these arrangements meet or exceed the minimum requirements defined in this Procedure

Where equipment/materials are not directly purchased by Harbour Energy, the nominated Responsible Engineer shall reinforce and, where applicable, verify that the Contractor has specified requirements for handling, storage, and preservation of their procured equipment/materials. This ensures the minimum requirements set out in this Procedure are met or exceeded.

4.2 Buyer

The Buyer, through consultation and engagement with either the Responsible Engineer, Quality Team, Technical Owner and/or Technical Authority Team, is responsible for:

- Attaching the relevant material preservation procedure to the Request for Quotation (RFQ)
- Inquiring during the RFQ process whether any preservation recommendations exist for subject items

As required, the Buyer shall request all necessary preservation documents from the supplier, including:

- Supplier storage/packing/handling recommendations
- Supplier preservation procedures
- Supplier warranty issues related to preservation

Where applicable, the required preservation process/procedure shall be shown as a separate line item on the Purchase Order (PO) to allow tracking of receipt by the company or by those delegated to procure on behalf of the company.

4.3 Harbour Energy Quality Team

The Harbour Energy Quality team is responsible for:

- Providing guidance to relevant Responsible Engineers and Buyers in terms of the minimum quality requirements associated with packaging, preservation and storage of packages, equipment and materials
- Supporting Supply Chain by providing guidance on relevant POs and associated Technical Delivery Terms (TDTs), codes and requirements for the preservation of packages, equipment and materials procured by Harbour Energy (including relevant contractors)

4.3.1 Quality Management Aspects

In addition to the above responsibilities, the Quality team shall also support the relevant quality aspects associated with the handling, storage and preservation of packages, materials and equipment by:

- Checking that purchased equipment conforms to its PO and product specifications
- Checking that procured equipment relates to its preservation requirements
- Liaising with third-party inspection service providers to arrange for competent QC Inspectors to carry out inspection assignments on behalf of Harbour Energy
- Monitoring the effectiveness of the Contractor's preservation processes where required
- Raising any Service Improvement Notices (SINs) due to non-compliance when procuring Harbour Energy materials and equipment with reference to handling, preservation, and storage aspects at contractors, fabricators, suppliers, or warehouse/stores/quayside facilities

4.4 Quality & Assurance Manager

The Quality & Assurance Manager is the owner of this Procedure and is responsible for:

- Ensuring a consistent and effective approach to the QA/QC of procured packages, equipment and materials. This is implemented with reference to the minimum Harbour Energy requirements and expectations for handling, storage and preservation

4.5 Technical Authority Team

The Technical Authority team is responsible for:

- The technical support required to purchase all equipment including but not limited to valves, pipes, fabricated spools/critical structural steel, mechanical and electrical packages, and chemicals. This is with reference to the minimum Harbour Energy requirements and expectations for handling, storage and preservation

4.6 Contractor (Supplier or Fabricator)

The Contractor (supplier or fabricator) is responsible for:

- Complying with or exceeding the applicable minimum requirements for handling, packaging, storage and preservation of Harbour Energy packages, equipment and materials that are set out in this Procedure
- Developing, maintaining and/or providing relevant procedures and supporting records/verifying documents as required by the Contract/PO for preservation of their supplied packages, equipment or materials
- Developing and implementing appropriate special procedures (e.g. handling, packaging, preservation) for the work being performed
- Making sure all the required documentation is available, including verification documents, to the Harbour Energy Quality team or the Harbour Energy representative/QC Inspector as required at relevant SQS/QC intervention points (e.g. Final Inspection & Release, Preservation Monitoring visits, etc.)
- Ensuring safe access to their facilities in order for Harbour Energy representative(s)/QC Inspector to carry out planned Supplier Quality Surveillance (SQS) visits/activities
- Delivering the contracted scope of work in accordance with the agreed Harbour Energy Contract/PO(s)

4.7 Contractor Warehouse/Stores Personnel

Contractor Warehouse/Stores personnel shall be suitably trained and/or competent to carry out their designated tasks/or relevant duties.

All Warehouse/Stores personnel should be provided with:

- Basic health and safety training
- Hazard identification training to help them identify hazards associated with their duties and within the Warehouse/Stores so that they can take appropriate precautions. For example, all operators of work equipment including those who drive vehicles, should receive suitable training on the equipment's related hazards and the controls that are in place for its safe operation

4.7.1 Contractor Warehouse/Stores Personnel – Management and Training

A senior member of staff within Contractor Warehouse/Stores should be appointed to be directly responsible for the identification, assessment, handling, and storage of all dangerous substances on site. This senior staff representative should be:

- Suitably qualified, trained and experienced
- Familiar with the relevant legislation applicable to the activities undertaken

Written operating procedures should be adopted to cover matters such as the selection of storage locations, dealing with spillages and security arrangements.

Warehouse/Stores personnel should have suitable training to help them recognise and understand the risks associated with particular classes of dangerous substances that will be kept in the warehouse/stores.

They should be:

- Shown how to understand the labelling system adopted under SI 2002/No. 1689 The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP) and the SI 2004/No. 568 Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004
- Told where particular substances should be stored and why
- Made familiar with the precautions and safety procedures adopted by the Warehouse/Stores facilities

5.0 INTRODUCTION

This Procedure aims to ensure that Harbour Energy's minimum requirements and expectations are defined and communicated to manage quality aspects associated with supplied equipment and materials.

This Procedure is used to ensure that key quality aspects relating to the handling, packaging, storage and preservation are adequately understood and communicated to relevant Contractors (e.g. suppliers, manufacturers and fabricators) so that such equipment and materials are adequately packaged and handled to ensure quality, availability and integrity is maintained during handling, storage and transportation.

The controls set out in this Procedure define the minimum Harbour Energy requirements and expectations to ensure that all procured Harbour Energy equipment, consumables and materials are:

- Fit for use and available in the correct working condition when required
- Do not have their relevant warranties jeopardised due to improper storage methods
- Preserved and stored correctly at all relevant Harbour Energy/Contractor warehouse/storage facilities

This Procedure also aims to improve efficiencies by reducing disposal of material and consequential replacement costs.

5.1 Implementation Timeframes for Warehouse and Storage Facilities

The requirements defined in this Procedure are new Company requirements. As such, this Procedure shall not apply to material or equipment already procured and/or material or equipment already in long-term storage at the time that this Procedure is issued.

In order to allow for effective roll-out and implementation of key quality provisions defined in this Procedure, the requirements set out shall not be fully auditable at Contractor facilities (including warehousing and storage facilities) until the end of 2024. During this period, temporary exemptions from specific requirements may be applied where required. This is to allow for an effective roll-out and sufficient timeframe to achieve full compliance with relevant handling, storage, and preservation requirements at such facilities/locations.

6.0 GENERAL REQUIREMENTS

6.1 Supplier Quality Surveillance

The general requirements detailed in this section serve as guidance for the minimum expectations for the handling, packaging, storage and preservation of Harbour Energy procured packages, equipment and materials. This section also provides guidance for associated SQS activities (including inspection and release), and subsequent preservation monitoring activities for relevant packages, equipment and materials that are in-scope of this Procedure and stored at warehouse/stores/quayside facilities.

For handling facilities (e.g. quaysides) with quick turnarounds there will be no requirement for SQS.

Where Harbour Energy procured packages, equipment or material is in storage at Contractor or Warehouse facilities then depending on the nature and criticality of the equipment, consideration should be given to carrying out SQS activity to check that the equipment is suitably stored, verify integrity of any packaging/ weather protection, and confirm status of any required maintenance activities (e.g. stroking valves, topping-up nitrogen blankets, etc.). Such preservation checks can be carried out by either a Harbour Energy representative or by competent third-party QC Inspectors in accordance with the Project Supplier Quality Surveillance Procedure, HBR-GBR-PRJ-PRC-0021 [Ref 2] and the Control of New Equipment and Materials Procedure, HBR-GBR-HSE-PRC-0085 [Ref 3]. However, when applicable, handling, storage and preservation guidelines provided will be incorporated into all major capital project contract language.

Further company guidance on 'when to perform SQS' can be found in Section 5.2 of Project Supplier Quality Surveillance Procedure [Ref 2].

6.2 Handling

All handling activities shall be undertaken with a high regard to the safety and risk of harm of all personnel engaged in the handling process of all Harbour Energy procured products/equipment and shall include preventative measures to mitigate and prevent damage.

All Contractor personnel, involved in the handling and transportation of goods or working within the warehouse/stores/quayside facilities are responsible for securing and protection of product/equipment quality during transporting and handling activities. Such personnel shall ensure that handling methods comply with any special requirements detailed within the manufacturer's requirements and any Harbour Energy specific requirements.

When handling spools and relevant packages (e.g. valves) certified wide fabric webbing slings/or padded slings of the recommended Safe Working Load (SWL) shall be used whenever possible to prevent damage to pipes, fabricated spools, valves or any other materials or equipment during handling and transportation.

6.3 Preservation of Equipment Prior to Packaging

The supplier shall be responsible for ensuring that the correct preservation process on the relevant equipment/materials is carried out in accordance with their own procedures or the guidance in Section 8.0.

Where applicable, the Supplier shall develop their own procedure(s) for preservation of supplied packages, equipment, and materials. The Supplier's preservation procedure as a minimum shall include preservation, handling, storage requirements for the type of equipment/materials covered. Specific preferred preservatives shall be included. The Supplier's preservation procedure shall, at a minimum, meet Harbour Energy or legislative requirements for the preservation, shipping, and storage of equipment/materials.

The supplier is responsible for providing a record of the level of preservation that the equipment has undergone prior to shipment/delivery.

6.4 Packaging

The supplier shall be responsible for the packaging of equipment. Supplied equipment should have sufficient protection from the elements and surrounding environment to stop contaminants from coming into contact with the materials/or equipment. Packaged materials/or equipment should be sufficiently braced and covered/wrapped within the exterior packaging. The packaging should be of appropriate shape and size, sturdy and secure with suitable lifting points (lifting lugs, pad eyes, forklift pockets, etc.) and considered suitable for short term storage in an outdoor environment for up to 6 months.

Once the materials and/or equipment has been packaged, suitable waterproof labelling shall be affixed which will clearly identify the following:

- Item name
- Item description
- Serial number
- Tag number
- Material master number (SAP number)
- PO

- Destination
- Addressee
- Sender

Materials/or equipment loaded onto pallets shall be checked to ensure load stability. Banding, shrink wrap or other suitable method be used to facilitate such stability requirements.

For valves shipped in packing cases, a cradle or carrier shall be provided which will support the full width of the valve within the packing case, irrespective of orientation of the packing case when landed. Packing cases shall be marked with the valve datasheet number. Further company guidance can be found in Section 18.2 of Piping Valve Specification Engineering Standard, HBR-GLO-TAI-STD-0021 [Ref 4].

When disposing of packaging materials, environmental issues should be considered, e.g. recyclable materials.

6.5 Shipping

The supplier should be aware that in some instances the package(s) may be subject to various modes of transport and handling (road/sea/air) before reaching the destination, including warehouse and storage facilities. When transporting by road, follow guidance on safety of loads (Department of Transport) and securing loads on vehicles (Health and Safety Executive). References can be found in Section 9.0 of this Procedure.

Any material deemed to be dangerous goods and capable of causing risk to health and safety and/or environmental damage whilst being transported, shall be shipped in United Nations (UN) certified packaging. QC intervention (e.g. review of certificates, photographs, or site inspections) may be required, to ensure that this aspect is adequately controlled and managed.

6.6 Goods Receipt Inspection at Warehouse/Stores/Quayside Facilities

Goods inspection and receipt is conducted at all warehouse/stores/quayside facilities by competent personnel on equipment/materials procured by, or on behalf of Harbour Energy.

Goods inspection requirements are carried out in accordance with the relevant PO.

Goods are subject to receipt check by competent warehouse personnel. As a minimum, this includes a check for damage, confirmation of quantity and identity, confirmation of preservation and storage requirements and a review of any certification/procedures provided.

6.7 Preservation

The senior warehouse/stores representative shall ensure that any products that require any special storage or preservation activities are stored in accordance with manufacturers recommendations and any specific Harbour Energy defined requirements.

An inventory and preservation regime managed on behalf of Harbour Energy by an approved Contractor shall be determined and implemented for applicable items/equipment to be preserved, stored for periods longer than 6 months. This shall be subject to Harbour Energy acceptance and approval by a relevant Engineering, Technical and/or Quality discipline.

A programme for regular stock checks and inventories shall be agreed with Harbour Energy with ad hoc stock checks carried out as and when requested. Upon completion of the inventory check, a report is issued. The recorded findings from the Contractor inventory check shall be reconciled within the Master Stock Register and/or the Stock Materials Report and any anomalies resolved.

Where possible products susceptible to corrosion should be packaged in a dry, non-corrosive environment for the duration of any specified storage interval. Packaging should be regularly checked for damage and item/components should be inspected for exposure to atmospheric conditions if the packaging is found damaged. Specific exemptions to these requirements (e.g. Oil Country Tubular Goods (OCTG)) are further defined in UK Wells Standards, HBR-GBR-WAD-STD-0001 [Ref 5] and Specification for Casing and Tubing Procedure, HBR-GBR-WAD-PRC-0012 [Ref 6].

Unless otherwise specified, machined, or threaded surfaces of valves shall be coated with a recommended preservative. Valves cleaned for special service shall not have a preservative applied.

It is generally good practice to ensure good housekeeping and cleanliness as this is a pre-requisite for successful implementation of preservation.

6.8 Storage

Storage locations internally within the warehouse/stores or external laydown or quayside areas shall be organised in such a manner that identification of product is clear and unambiguous. The internal storage areas shall contain suitable lighting, storage racks and bins as appropriate and all items shall be stored to allow safe and ease of access and egress. Racking systems shall be properly designed and installed with SWL adequate to take the weight of the goods being stored. Racking will be subject to a 6-monthly examination by a certified third party. Products shall be stored to prevent the potential for items to fall with the potential for harm to passers-by and for the purposes of loading/unloading using forklift and any other mechanical means.

Valves being stored shall have internal protection suitable for up to 12 months. For storage periods longer than 9 months, the supplier shall prepare a long-term preservation and storage procedure, subject to acceptance by the Purchaser. Consideration should be given to nitrogen purge for high value items in long-term storage. All high alloy valves shall be enclosed by wrapping in a vapour-proof barrier material.

All valves which have been in storage for periods greater than 18 months should be re-tested, re-certified and witnessed and accepted by a company representative or a third party acting on behalf of the company.

Valves that are identified as SECE shall be retested upon removal from storage if it has been more than 18 months since their previous test. Retesting of non-SECE valves is not required providing that they have been stored in a clean and dry indoor location.

Valves which are to be stored for periods greater than 2 years shall be subject to a maintenance programme commensurate with the valve type and service. This could include stroking, re-oiling, reapplication of preservative, etc, and shall be in accordance with Supplier preservation procedure, subject to Harbour Energy approval.

Further company guidance can be found in Section 18.3 of Piping Valve Specification Engineering Standard [Ref 4]. Refer to UK Wells Standards [Ref 5] and Specification for Casing and Tubing Procedure [Ref 6].

6.8.1 Material Segregation

Materials with high alloy content (super alloys or exotics) shall always be physically segregated to avoid contact, cross-contamination and chemical interaction. All alloys with intentional additions above 9wt% (including 13CRs) suffer from iron contamination so best practice is to segregate anything considered 'corrosion resistant' from the carbon and low alloys. Where metal racking or shelving are to be used for storage, packing of non-porous material (e.g. rubber or plastic) shall be used to isolate super alloys or exotics materials from the metal framework. There shall be no contact between dissimilar metal materials.

Materials should be stored in a manner to provide continuous protection against salt, excessive humidity, condensation, moisture, aggressive industrial atmospheres, and dissimilar metal corrosion. Dissimilar metals shall be stored segregated and/or coated/covered to prevent direct contact in order to prevent galvanic corrosion. At no time shall super alloys or exotic materials be transported or handled using steel chains or lashings. Tissue ropes or straps shall be used.

Temperature ranges should be considered and suitably managed to ensure that ambient temperatures in the defined storage area(s) do not fall below or exceed the specified recommended range by the supplier or manufacturer. Guidance can be sourced from Health and Safety Executive publication HSG76, Warehousing and storage: A Guide to Health and Safety.

6.8.2 Shelf-life Management

Some types of substances may degrade or become unstable during prolonged storage or if stored at incorrect temperatures. These substances should be identified by information from the supplier, manufacturer or Material Safety Data Sheet (MSDS). Maximum recommended storage times should not be exceeded, and this should be achieved by careful stock rotation. This advice of the supplier should be sought if material is found which has reached, or is about to reach, the recommended latest storage date.

Any Harbour Energy materials, equipment, or stock held for a prolonged period should be inspected at intervals to detect any damage or degrading packaging. Records of inspection shall be maintained.

7.0 SPECIFIC EQUIPMENT AND MATERIALS REQUIREMENTS

Harbour Energy procure various types of packages, equipment, and materials, with those listed in this Section commonly called upon.

The list of equipment and materials in this Section is not exhaustive. However, these products shall remain fit for purpose until time of being put into service. There are various activities required to maintain this fit-for-purpose status, and the associated minimum expectations for handling, storage, preservation, and transportation of commonly procured packages, equipment and materials are defined in this Section.

7.1 Pipes/Fabricated Spools/Tubulars

The physical movement of pipes/fabricated spools/tubulars shall be achieved by using certified wide fabric webbing slings/or padded slings of the recommended SWL. This will mitigate and prevent damage to surfaces including coatings. The use of unprotected forks for lifting pipes/fabricated spools/tubulars on forklift-trucks is not permitted.

Pipes/fabricated spools and tubulars shall be stored as follows:

- Pipes/fabricated spools and tubulars shall not be stored directly on the ground to minimise any potential ingress of rainwater any other foreign matter and from potentially harmful environments
- Any pipe which is not palletised in a secured manner shall be stored on wooden sleepers off the ground. Wooden chocks shall be in place at either pipe end to prevent the potential for material to become loose or cause harm to personnel
- Storage/laydown areas whenever possible should be level and shall provide a non-corrosive environment, with passable drainage to prevent the pipes from coming into contact with still or running water
- Storing pipes, fabricated spools or tubulars of dissimilar material shall be segregated at all times to mitigate cross-contamination

- Tarpaulins shall be used to protect materials stored outside from adverse weather conditions. Tarpaulins shall be affixed to allow airflow underneath to mitigate condensation under tarp
- All areas shall be easily accessible
- Moisture absorbers to be placed within pipework during storage
- Openings in pipe spools shall be sealed to prevent water and other foreign materials from entering during transit and storage. The fitting of heavy-duty plastic end caps are preferred, providing they cover the full flange face
- Small bore branches and small header attachments shall be adequately braced or otherwise protected to prevent damage during handling, transportation, and storage
- Machined and threaded parts shall be coated with grease or other suitable material as required to prevent corrosion
- Socket weld and threaded ends shall be sealed to prevent water and other foreign materials from entering during transport
- Flange faces shall be suitably protected to prevent damage
- Flanges

All flanges shall be stored with complete flange face protected with either plastic cap end protection or wooden blanks. In addition, the faces shall be sealed from moisture to prevent corrosion and pitting:

- Flange faces shall be protected with manufactured supplied protection
- No compound or tape shall be applied to flange faces or gaskets
- Flanges shall be placed within a suitable crate when manoeuvred by forklift
- A minimum of one suitable absorbent moisture pouch per flange shall be placed within the crate
- Crate to be fully sealed to prevent water ingress
- Suitable waterproof labelling shall be attached to the top of the crate detailing contents and weight of package
- Inspect absorbent moisture pouches every 3 months to ensure they remain active. Replace as required and repeat process to seal crate

7.2 Valves

Guidance on the minimum basic company requirements for the design and supply of topside and onshore engineered valves for all new capital projects and modification projects, as well as minor projects can be found in the latest version of Piping Valve Specification Engineering Standard [Ref 4], specifically Section 18.0, which supports the process annotated in this Procedure.

- Valves exceeding 25kg shall be provided with lifting points unless otherwise agreed. Further company guidance can be found in Section 15.3 of Piping Valve Specification Engineering Standard [Ref 4]
- Valves, whenever possible, shall be shipped in a wooden crate, fully sealed to prevent water ingress. They shall also have suitable moisture-absorbent pouches placed in the crate prior to boxing up, or alternatively shipped on a wooden pallet; however both modes shall be suitably packed and supported to prevent movement during transportation

- Valves shall be made ready for shipment in a manner that will avoid damage to, or atmospheric corrosion of, internal or external surfaces or parts during sheltered storage and transport
- Gate and globe valves shall be in the closed position for shipment
- Gate and globe valves with soft seals shall have the wedge disc backed-off, to relieve pressure on the seal
- Plug and ball valves shall be shipped in the open position
- Butterfly valves shall be shipped with the disc cracked open (i.e. off the seat), unless otherwise specified by the supplier
- Valves that are actuated shall be shipped in accordance with the recommended practice of the supplier. Actuated valves shall be either free from stored pressure, or presence of pressure clearly defined in supporting documentation (data sheets, etc.)
- Check valves that have blocking between the seat and piston/disk/ball to prevent in-transit damage to the seat shall be tagged to indicate that blocking is installed
- Tag shall indicate that the blocking shall be removed before installation
- Threaded or socket-welded openings shall be closed with metal or plastic protectors to prevent dirt and other foreign matter from entering the interior of the valve.

Note: *All plastic plugs installed in flanges shall have a tell-tale device to negate installation with the plug during fitting.*

- Valves manufactured of high alloy shall be enclosed by wrapping in a vapour-proof barrier
- Unless otherwise specified, machined, or threaded surfaces of valves shall be coated with a recommended preservative. Valves cleaned for special service shall not have a preservative applied
- Flange facings and butt-welding ends shall be protected over the entire gasket-seating surface or butt-welding end with wood, plastic covers
- Protection covers shall prevent dirt and other foreign matter from entering the interior of the valve and damaging and damaging the flange facings or butt-welding bevels, tape shall not be used as the sole covering method

7.3 Gaskets, Bolts and Nuts

Gaskets, bolts, and nuts shall be stored inside the Warehouse/Stores facility above dewpoint temperatures. If these items are in proper original wrapped up condition (as delivered from the supplier) no further preservation is required. Loose materials shall be 'bagged and tagged' and traceable back to the PO.

7.4 Mechanical Seals/Elastomers

These instructions apply to all mechanical seals which have been supplied and stored in their undamaged original packaging as well as to seals which have been installed in a component of a plant (e.g. pump, compressor, etc.), but have not yet been put into operation. Anticorrosive lubricant materials shall not be used on the seals unless previously recommended. Sliding materials and elastomers are subject to material-specific and time-based alterations (distortion, ageing) which might reduce the full efficiency of these seals.

Mechanical seals, whenever possible, shall be stored:

- In an environment recommended by the manufacturer
- In areas that are generally free from dust
- At a consistent recommended temperature
- With moderate ventilation
- Out of direct exposure to radiated heat, ultraviolet light caused by direct sunlight, heaters, arc welding, halogen or fluorescent lamps to mitigate risk of embrittlement of elastomeric materials. The materials should be stored in a relaxed condition, free from tension, bending, compression or other deformation. No 'hanging' allowed. Where products are packaged in a strain-free condition, they should be stored in their original packaging

If the mechanical seal has been in storage for more than 12 months, then a detailed inspection shall be carried out to determine the product(s) remain fit for purpose.

Damage caused by improper storage may affect their warranty (the manufacturer's recommended preservation instruction shall take precedence over the following recommendations).

If the product shelf-life has expired whilst in storage, then the product shall be returned to the original manufacturer/supplier who shall advise the appropriate action to take.

7.5 Electrical Equipment

Consideration should be made for all electrical equipment of high criticality being stored in a secure area. The units should be stored wherever necessary under cover in a warm, clean, dry and vibration free environment. The following are examples where this would be considered:

- Motors, large HV motors, motors held as critical spares, motors in excess of 100kW or those with known long lead

These should be stored in an environmentally controlled environment and be subject to defined preservation program which should consider external and internal preservation products including greases and vapour phase inhibitor pots, barring over, routine static electrical tests and periodic inspection and run by a competent contractor.

- Batteries

Batteries will not hold charge indefinitely and may be dependent on particular chemistry irreparably damaged if stored in a discharged state. Where batteries are to be held in storage, they should on entry be fully charged and thereafter checked on a 6-month rotation to confirm state of charge and be subject to re-charge by a competent contractor if required. Batteries exiting storage after a period in excess of 6 months should be subject to re-commissioning charge subject to shipping for use.

- Large electrical equipment held in long term storage

This equipment may include control panels, generators, spare winding cores. Preservation of this type of equipment may require treatment with preservation fluids and/or use of vapour phase corrosion inhibitors and thereafter sealing within seet or equivalent bags. Ongoing preservation activity shall be appropriate to the initial preservation technique and not unnecessarily disturbed.

7.6 Instrumentation

All openings in hydraulic/pneumatic tubing shall be provided with steel caps or solid shank steel plugs for metallurgy equal to the metallurgy of the component being capped or plugged. Non-metallic plugs shall not be used.

7.7 Flexible Hose Assemblies

Flexible Hose Assemblies (FHAs) should be transported, handled, stored in accordance with the manufacturer's recommendations, which includes the FHA storage life. In addition to the manufacturer's recommendations, ISO 8331:2016 Rubber and Plastics Hoses and Hose Assemblies – Guidelines for selection, storage, use and maintenance also provides guidance on the correct storage of FHAs.

Harbour Energy minimum requirements for the transportation, handling and storage of FHAs are depicted in the company Flexible Hose Assembly Management Procedure, HBR-GBR-TAI-PRC-0017 [Ref 7].

7.8 Dangerous Substances (Liquid or Solid)

Warning notices or signs should be posted advising that dangerous substances, e.g. chemicals are being stored. Refer to Paragraph 764 of Health and Safety Executive publication HSG76, Warehousing and storage: A guide to health and safety .

Drums containing chemicals should be stored in accordance with the recommendation of the supplier. The drums should be stored in a secure area and stored in the correct orientation wherever possible. Drum labelling should be clearly visible. Stores personnel should have the awareness as depicted in Section 4.7.1 of this Procedure.

Where liquids are stored provision for containing spillages should be in place. Barrier materials such as sandbags or proprietary absorbent pads/socks/granules are recommended, depending on the nature of the substance and quantities involved. The chosen absorbent should not adversely react with the substance to be adsorbed. Refer to Paragraph 760 of Health and Safety Executive publication HSG76, Warehousing and storage: A guide to health and safety.

Recommended personal protection equipment will be necessary for dealing with accidental release of dangerous substances. For further information, refer to Paragraph 762 of Health and Safety Executive publication HSG76, Warehousing and storage: A guide to health and safety.

Before any potentially dangerous substance is purchased or shipped offshore, such substances be approved for use through the TASC chemical approval system. All Safety Data Sheets (SDSs) for dangerous substances shall be either held in TASC and/or be made available as a hard copy on the asset as per the requirements set out in COSHH TASC Procedure, HBR-GBR-HSE-PRC-0047 [Ref 8].

8.0 AUDIT

As part of the contractor audit process, Harbour Energy may look to review key contractor arrangements for handling, storage and preservation of packages, material, and equipment, and verify applicable contractor's processes are compliant with the minimum requirements defined in this Procedure. Such contractor audits shall be carried out in accordance with Contractor Audit Procedure, HBR-GBR-HSE-PRC-0025 [Ref 9].

9.0 REFERENCES

Note: *The Harbour Energy BMS document references below are subject to change. The electronic Harbour Energy BMS should be consulted for the most up-to-date revisions.*

1. BMS Document Dispensations Procedure, HBR-GLO-ASR-PRC-0003.
2. Project Supplier Quality Surveillance Procedure, HBR-GBR-PRJ-PRC-0021.
3. Control of New Equipment and Materials Procedure, HBR-GBR-HSE-PRC-0085.
4. Piping Valve Specification Engineering Standard, HBR-GLO-TAI-STD-0021.
5. UK Wells Standards, HBR-GBR-WAD-STD-0001.
6. Specification for Casing and Tubing Procedure, HBR-GBR-WAD-PRC-0012.
7. Flexible Hose Assembly Management Procedure, HBR-GBR-TAI-PRC-0017.
8. COSHH TASC Procedure, HBR-GBR-HSE-PRC-0047.
9. Contractor Audit Procedure, HBR-GBR-HSE-PRC-0025.

Legislation and Regulations

- SI 1990/No 304 The Dangerous Substances (Notification and Marking of Sites) Regulations 1990
- SI 2002/No. 1689 The Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP)
- SI 2004/No. 568 The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004

Industry Standards/Codes/Guidance

- Health and Safety Executive: Vehicles at Work – Vehicle Safety – Securing Loads
- HSG76, Warehousing and storage: A Guide to Health and Safety 2007
- ISO 8331:2016 Rubber and Plastics Hoses and Hose Assemblies – Guidelines for selection, storage, use and maintenance Edition 4, November 2016

Other Documentation

Note: *The following document(s) are not directly referenced in this Guideline but are listed for referencing purposes.*

- BS 1133-8:2011+A1:2016 Packaging Code. Guidance on wooden boxes, cases, and crates
- Driver and Vehicle Standards Agency: Load Securing: Vehicle Operator Guidance, March 2023
- ISO 2230:2022 Rubber Products – Guidelines for storage
- NORSOK Z-006 Preservation, Edition 3, August 2015
- Quality Manual, HBR-GBR-HSE-RES-0084.
- SI 2002/No 2677 The Control of Substances Hazardous to Health Regulations 2002
- The Health and Safety at Work Act 1974 (Commencement No. 1) Order 1974