

## Bayu Undan / Darwin LNG Facilities Technical Delivery Terms

<b>Material Description:</b>	Flexible Hose Assemblies (FHAs)		
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### 1 SCOPE

This document outlines the general technical requirements for the supply of flexible hose assemblies (FHAs) required for the ConocoPhillips Australasian Business Unit (ABU) – West facilities managed by the Darwin Operations Centre.

### 2 GENERAL REQUIREMENTS

The engineering, specification, procurement and supply of FHAs shall be in accordance with the requirements of the ConocoPhillips Flexible Hose Management Policy document number DOC/MAIN/POL/001. The policy document explains the requirements for temporary and permanent flexible hose assemblies and is supplemented by this Technical Delivery Terms document which specifies traceability and certification levels and requirements.

Specifically, the following codes and standards shall apply to all FHAs purchased for these facilities (unless clearly specified otherwise on the relevant datasheet):

ISO 1402	Rubber and plastics hoses and hose assemblies – Hydrostatic testing
AS/NZ 2554	Hose and Hose Assemblies for Airs – Ring Joint, Spiral Wound and Jacketed.
ASME B16.5	Pipe Flanges and Flanged Fittings.
EN 10204	Metallic Products – Types of inspection documents.
ISO 10380	Pipework for Corrugated Metallic Hoses and Hose Assemblies
ASME IX	Boiler and Pressure Vessel Code – Welding and Brazing Qualifications
ASME B31.3	Process Piping

Full descriptions of the hose types, diameters, lengths, end fittings (inclusive of material grades), operating conditions (temperature and pressure) and the intended service shall be provided by the Purchaser on any order for FHAs. All FHAs shall be manufactured in accordance with a COP engineering approved datasheet unless certain provisions apply (eg temporary FHAs, see DOC/MAIN/POL/001 for guidance).

All welding of end fittings shall be performed and supported by documentary evidence of a qualified Welding Procedure Specification in accordance with ConocoPhillips specifications for Welding and Inspection of Piping Systems Doc. No H8-GEN-00-020-S01-0003.

### 3 TESTING & TEST FACILITY REQUIREMENTS

FHAs shall (as a minimum) be subjected to a hydrostatic proof pressure hold test in accordance with the requirements of ISO 1402 section 8.1. This defines proof pressure ratio relative to maximum working pressure of a FHA, and also defines the requirements for test method in terms of required pressure rate increase / decrease and also hold time at proof pressure. Where a FHA manufacturer or specific manufacturing standard specifies different requirements (not complying with this standard) the proposed testing will be assessed separately. DOC/MAIN/POL/001 provides guidance in cases where testing to AS 1180.5 has been recommended / performed.

Testing facilities approved for performing pressure testing of FHAs shall conform to the requirements of AS ISO / IEC 17025 and be NATA accredited in the field of Mechanical Testing, Class 13.65.11 (Pipes, hoses, valves and fittings, Hydrostatic pressure tests). DOC/MAIN/POL/001 provides guidance in cases where pneumatic pressure testing is recommended / necessary.

Where testing needs to be performed outside of Australia, testing shall be performed by an appropriate and competent FHA testing facility but must be independently witnessed by a third party inspector / surveyor from a Classification Society who is a member of the International Association of Classification Societies (IACS).

### 4 CERTIFICATION REQUIREMENTS

For all flexible hose assemblies, material certification shall be provided in accordance with the requirements of EN 10204 as follows:

Component / Material	Medium	Hazard Level	EN 10204 Reference
Hose	Condensate & LPG	ALL	Material certificates to 3.1
	Hydraulic		Batch test certificates to 2.2
	Nitrogen		
	Air		Certificates of compliance to 2.1
	Water		
	Oxygen		
	Acetylene		
Fittings	SS316	B-D (inclusive)	Material certificates to 3.1
		E	Batch test certificates to 2.2
	Aluminium	ALL	Certificates of compliance to 2.1
	Bronze		
	Carbon Steel		
Couplings – Surelock / Kamlok etc	SS316	E	

NOTE: Where applicable, for any welding the items shall be accompanied by a qualified and approved welding procedure specification, welder qualification records, post-weld heat treatment records, non-destructive testing (NDT) reports and proof load testing report (or engineering calculation and NDT) for lifting lug / pad-eye welds.

The certificates shall be in the English language or in other languages if they are accompanied by an endorsed and dated English translation of the contents. All certificates shall be originals or certified copies of the originals.

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The Supplier shall retain on file (and make available on request by the Purchaser) certification including evidence of relevant type tests performed on the specific hose assemblies. These type tests shall include proof pressure hold tests and burst tests as specified in ISO 1402, or an approved equivalent standard.

## **5 IDENTIFICATION**

In accordance with the requirements of DOC/MAIN/POL/001; all hoses shall bear the Hose Manufacturers identification and design markings. The completed hose assembly shall be fitted with a tag (stainless steel preferred) indicating the date of manufacture, maximum working pressure, proof test pressure and where applicable the Hose Tag number. Also where applicable the hose end fitting shall be painted with the relevant colour code consistent with the requirements of AS 1345.

## **6 PRESERVATION AND SHIPPING REQUIREMENTS**

Crating and packages shall be suitable for opening and resealing without difficulty or damage. Preservation shall be such that if the packaging is disturbed, then negligible degradation is permitted for a minimum period of 12 months from dispatch from the vendor's works. Crating and packages shall be marked with clear handling, storage and warning instructions to protect against damage to the preservation applied. Any FHAs that require complete protection from weather (eg water ingress etc) shall be sealed with blanks as appropriate to prevent any contaminants from entering during handling / transportation. H8-GEN-00-030-S01-0103 (Export Packing Requirements) also provides guidance.