



PTT Exploration and Production Public Company Limited

PTTEP Engineering General Specification
(Engineering and Development Group)

Standard

Material Traceability

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TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	PURPOSE	1
3.0	SCOPE	1
4.0	RESPONSIBLE ACTION PARTIES.....	1
5.0	DEFINITIONS	2
5.1	Language	2
5.2	Terminology	2
5.3	Common Acronyms	3
6.0	REFERENCES.....	4
6.1	PTTEP Internal References	5
6.2	International Standards.....	5
6.3	Code and Other Standards.....	5
7.0	MATERIAL TRACEABILITY.....	6
7.1	Marking and identification	6
7.2	Traceability.....	6
7.3	Traceability for Various Items	8
7.4	Material Certification	9
8.0	APPENDICES.....	10
Appendix 1.	Certification Requirement for Various Items.....	10

1.0 INTRODUCTION

Traceability means the ability to identify a specific piece of material or component, throughout its life, and its specific Mill Test Report.

Traceability through the accurate maintenance and retention of records provides the ability to identify and track a product or a component through its provenance to its point of origin.

2.0 PURPOSE

The purpose of this general specification is to provide requirements for all activities associated with material identification, traceability and certification for the supply, fabrication and installation of material.

3.0 SCOPE

This specification defines the minimum requirements for identification, material traceability, and certification for the supply, fabrication and installation of the WORK.

This specification shall also be applicable to Sub-contractors, Vendors including their supply chain.

4.0 RESPONSIBLE ACTION PARTIES

- CONTRACTOR
- Sub-Contractor
- Vendor
- Fabricator
- Manufacturer

5.0 DEFINITIONS

A number of different terms are commonly used to describe the work stages, processes, and approvals which take place during the early stages of a development. This can often be a source of confusion so the following section is intended to show the PTTEP preferred terminology as used in this document.

5.1 LANGUAGE

In this document, the words should and shall have the following meanings:

Shall	Indicates a course of action with a mandatory status. The term “shall” shall be used if a requirement is considered to be necessary to claim compliance with a PEGS document.
Should	Indicates a preferred course of action. Should is a non-mandatory word and is not forbidden, but use in the body of the text should be the exception. Where none mandatory terms are used, each paragraph within these clauses shall also have an associated commentary paragraph that provides the rationale for why the stated choices and modifications are appropriate and circumstance under which the stated choices and modifications might be different.

5.2 TERMINOLOGY

Terminology	Description
Approval	The authorisation in writing given by the COMPANY to the CONTRACTOR on a procedure or to proceed with the performance of a specific part of the work without releasing in any way the CONTRACTOR from any of his obligations to conform with the technical specifications, requisitions, etc. The words “Approve”, “Approved” and “Approval” shall be construed accordingly
Certifying Authority (CA)	A suitably qualified independent Third Party providing certification of the project based on the agreed scope of work
COMPANY	PTT Exploration and Production Public Company Limited (PTTEP) and affiliates
CONTRACT	CONTRACT means the signed AGREEMENT together with the Exhibits and Annexes which are made part thereof, and any future amendments thereto. In the event of ambiguity or contradiction between the AGREEMENT and the other documents, the AGREEMENT shall prevail over its Exhibits and Annexes.
CONTRACTOR	Per contract: CONTRACTOR – ‘The contractor who is a Party to this CONTRACT and where the context so requires, any and all Sub-Contractors utilized by Contractor for the performance of the WORK’
Full Traceability	The documented evidence of a product or equipment. Documents shall include but not limited to mill certificates, test reports, NDT reports, corrosion test reports and any other documents as required by the code and specifications. These records shall be fully traceable to the relevant component or part of the finished product or WORK and shall be included in the Manufacturer’s Data Report / final documentation.
Sub-contractor	Any company or person to whom CONTRACTOR has subcontracted directly or indirectly the performance of any part of the WORK in accordance with the CONTRACT.

Terminology	Description
	Sub-contractors include Vendors
Vendor / Supplier	The company designated on the Purchase Order form or Contract as being the selected supplier of the said materials
WORK	All and any part of the works and services required to be performed by CONTRACTOR under the CONTRACT
WORKSITE(S)	The SITE and/or all and any construction location(s) where major parts of the PLANT (such as deck, jacket, piles, modules) will be fabricated and assembled by CONTRACTOR

5.3 COMMON ACRONYMS

Set out below in alphabetical order are common acronyms as found within this document:

CA	Certifying Authority
NDT	Non-destructive testing
P&ID	Piping and Instrumentation Diagram
PWHT	Post weld heat treatment
WPS	Welding procedure specification

6.0 REFERENCES

The reference documents listed below, including Industry Codes and Standards and COMPANY specifications, form an integral part of this Engineering General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published on the effective date of a contract.

The overall order of precedence of the applicable documents shall be:

1. Applicable Laws, Rules and Regulations of the country in which the system/equipment will be operated (if any);
2. Purchase Order/ Service Order/ Contract Documents (Only applicable for direct purchase by COMPANY);
3. Project Particular Specification (PPS), and relevant data sheet(s) if any;
4. COMPANY General Specification;
5. Codes and Standards in reference.

Any conflict between any of the Contract Documents, or between this specification and any other Contract Documents, shall be reported to COMPANY for decision. In such a case, and unless otherwise agreed or decided by COMPANY, it is understood that the more stringent requirement shall apply.

Exceptions to, or deviations from this specification are not permitted unless previously accepted in writing by COMPANY. For this purpose, requests for substitutions or changes of any kind shall be completed with all pertinent information required for COMPANY assessment. COMPANY's approval, nevertheless, will not, in any way, relieve the responsibility of the Contractor to meet the requirements of the industry Codes and Standards referred to and amended herein, in the event of conflict.

6.1 PTTEP INTERNAL REFERENCES

Internal documents applicable to this document are indicated in the table below.

Document Number	Document Title
10008-STD-6-INS-012* PEGS-0710-INS-006**	On/Off Valves and Control Valves Sizing, Selection and Specification
10008-STD-6-OSS-007* PEGS-12059-OSS-002**	Materials for Offshore Steel Structures
10008-STD-6-PIP-012* PEGS-12059-PIP-006**	Valves
10008-STD-6-SSE-030* PEGS-0710-SSE-030**	Subsea Multiphase Flow Meter
10008-STD-6-SSE-036* PEGS-0710-SSE-036**	Subsea Hydraulic Spring Return Quarter Turn Actuators

*New document number due to revision in document numbering system

**Old document number

6.2 INTERNATIONAL STANDARDS

International standards applicable to this document are indicated in the table below i.e. ISO, IEC or ITU.

Document Number	Document Title
ISO 10474	Steel and steel products – Inspection documents

6.3 CODE AND OTHER STANDARDS

Codes, standards and regional legislation applicable to this document are indicated in the table below.

Document Number	Document Title
EN 10204	Metallic products-Types of inspection documents

7.0 MATERIAL TRACEABILITY

7.1 MARKING AND IDENTIFICATION

All material shall have Manufacturer's original marking clearly legible. The identification marking shall comply with relevant material specification (e.g. API, ASTM, ISO etc.) including applicable COMPANY specification.

Color coding shall be applied to each material to distinguish different materials or materials of different grades. CONTRACTOR shall submit their identification procedure including color coding procedure for COMPANY review / approval prior to commencement of fabrication.

When material is required to be cut in two or more pieces, heat number / lot number or unique identification number traceable to heat number shall be transferred on the individual cut pieces.

Heat numbers of the completed piping spools (especially process piping) shall be 100% verified by CONTRACTOR prior to release of spools for painting and/or installation.

7.2 TRACEABILITY

Material traceability shall be maintained from receipt of raw material / individual component, through various stages of fabrication up to final installation.

CONTRACTOR shall have an established, documented and well maintained traceability system that identifies the products and materials from receipt and during all stages of fabrication and installation.

CONTRACTOR shall submit material and weld traceability procedure to COMPANY for review and approval prior to commencement of the WORK.

CONTRACTOR shall ensure that all materials delivered to the WORKSITE(S) are clearly identified and traceable throughout all the stages of the project.

Material traceability record shall be maintained by CONTRACTOR and it shall consist of following information as a minimum;

- Part number / Item number (as per Bill of Material or Drawing)
- Material specification
- Grade
- Size (thickness, diameter etc.)
- Heat / cast number
- Lot number / Batch number
- Unique serial number (e.g. Pipe number in case of line pipes)
- Mill Test certificate number

CONTRACTOR shall also maintain full traceability of each weld throughout all stages of fabrication. CONTRACTOR shall provide their method of identification and traceability of each weld such as using sticker or stenciled marking adjacent to weld joint.

Weld traceability record shall have following information as a minimum;

- Weld Map and NDT Map reference
- Isometric drawing or shop drawing reference
- Weld identification / joint number
- Approved WPS reference
- Welder(s) / Welding operator(s) identification
- Heat number and / or Unique serial number of the material welded
- Fit-up date and status
- Date / time of welding
- Visual inspection date and status
- NDT date and status
- PWHT date (if required)

In case of weld repair, traceability record shall contain following information;

- Weld identification / joint number
- Approved WPS reference
- Welder(s) / Welding operator(s) identification
- Date of repair welding
- Re-visual inspection date and status
- Re-NDT date and status
- PWHT date (if required)

For weld repairs, weld repair excavation and monitoring records shall be maintained for the following;

- Cracks
- Special and first category structure welds
- Process piping components with rating 600 # and above
- All risers and pipelines
- All pressure vessels / tanks / filters / heat exchanger, except those designed to atmospheric condition
- All welds in sour service application

When doubt exist regarding the identity or traceability of product or conformance of a weld with the approved welding procedure, CONTRACTOR shall be responsible to quarantine the product or weld in question from the WORK until the proposed corrective action(s) have been accepted by COMPANY and / or CA.

In the event material confirmation test is required, extensive mechanical tests and chemical analysis including grain sizing and metallographic examination where appropriate shall be carried out in agreement with COMPANY.

7.3 TRACEABILITY FOR VARIOUS ITEMS

Traceability requirement for various items is as follows:

7.3.1 STRUCTURAL

Full traceability shall be required for special and first category members as defined in the relevant specifications.

Full traceability is also required on items which are deemed as critical to the WORK in the opinion of COMPANY.

7.3.2 PIPING COMPONENTS

Full traceability shall be required for all components including pipes, fittings, valves, doubler plates or pads and related instrumentation of functional system for all piping classes and for all sizes.

7.3.3 VALVES

In general, valves shall be identified as per the requirements of 10008-STD-6-PIP-012 "Valves" and 10008-STD-6-INS-012 "On/Off Valves and Control Valves Sizing, Selection and Specification.

The Manufacturer's heat or melt number shall be recorded on the pressure containing parts e.g. valve body, bonnet and covers. All valves shall have identification markings either on the body of the valve or on a 316 stainless steel identification plate permanently fixed to the valve.

In addition to the above identification, each valve shall have a 316 stainless steel tag wired with 316 stainless steel wire to the valve identifying the valve tag number (e.g. LCV-1020) and valve size.

Each pressure retaining components and trim material of the valve shall be traceable to the heat number and corresponding material test certificate.

7.3.4 PIPELINE AND RISER

Full traceability shall be required for the complete riser (including pig launcher and receiver) and pipeline systems including line pipes, bends, elbows, flanges, tees, barred tees, corrosion probe, reducers, valves, associated equipments etc. irrespective of service.

7.3.5 PRESSURE VESSELS / HEAT EXCHANGER / TANKS / FILTERS

Full traceability shall be required for all pressure components such as dished end, shell, pipes, fittings, etc. irrespective of service. Full traceability shall also be required for all parts welded to pressure parts.

For Tanks and Filters subjected to atmospheric design condition, traceability shall comply with the relevant specifications or as agreed with COMPANY.

7.3.6 ELECTRICAL AND INSTRUMENTATION COMPONENTS

All tagged electrical and instrument items shall require full traceability.

In general, electrical and instrument components shall be identified as per applicable PEGS and project specification requirements.

All instrumentation where applicable shall have the manufacturer's heat or melt number recorded on the body, cover, flange etc.

All electrical cables shall be traceable back to batch certificates detailing acceptance standards.

7.3.7 EQUIPMENT

All rotating equipment including but not limited to compressor, gas turbines, pumps, etc. shall be properly identified with descriptive nameplates.

Full traceability is required for all tagged equipment as defined in P&ID. In addition, all equipment shall be traceable to COMPANY's equipment lay out drawings, P&IDs, etc.

7.3.8 PACKAGED UNITS

In case of packaged units or skid mounted assemblies, traceability shall be maintained for each item as mentioned above from 7.3.1 through 7.3.7.

7.4 MATERIAL CERTIFICATION

Type of certification shall conform to relevant code / standard and applicable specification including project specific requirements. Unless otherwise specified, certification requirements for various items shall be as per Appendix 1.

The inspection certification shall conform to EN 10204 or ISO 10474.

8.0 APPENDICES

Appendix 1. Certification Requirement for Various Items

Item	Required certificates or test reports	Type of certification required	Remark
Piping			
Valve	- Pressure test / leak test report - Fire safe test report (as applicable) - Low temperature test reports (as applicable) - ENP / Tungsten carbide coating reports (as applicable) - NDT reports - Coating reports - Mill test certificates	EN 10204 Type 3.1	Material certification of various components in valve is governed by 10008-STD-6-PIP-012 (Valves)
Pipe fittings	- Material test certificates - Proof test certificate / burst test certificate	EN 10204 Type 3.1	
Pipes / forgings	- Material test certificates - Hardness test report for RTJ groove in case of RTJ flanges - NDT reports (as applicable)	EN 10204 Type 3.1	
Fasteners	Material test certificates	EN 10204 Type 3.1	
Gaskets	Material test certificates	EN 10204 Type 3.1 for Spiral wound, Metallic and RTJ gaskets EN 10204 Type 2.2 for non-asbestos flat gaskets	
Flexible pipes and hoses in process application	- Material test certificates - Hydro test report	EN 10204 Type 3.1	

Item	Required certificates or test reports	Type of certification required	Remark
	Type test / Burst test certificates		
Flexible pipes and hoses in utility applications	- Material test certificates - Hydro test certificate - Type test / Burst test certificates	EN 10204 Type 2.2	
Pressure Vessel / Mechanical Equipment			
Pressure vessel / Heat Exchanger / Filter	- Mill test certificates - ASME U form (if applicable) - Certificate of code compliance - NDT reports - Pressure test / leak test report - Coating reports - Heat treatment chart / reports - Production test reports - Name plate rubbing - Visual / dimensional reports	EN 10204 Type 3.1 for pressure parts and supports Type 3.2 certificate for plates with nominal thickness 50mm or more EN 10204 Type 2.2 for non-pressure parts	
Mechanical Equipment (Pump, motors, turbines, compressors, dryer, heater etc.)	- Material test certificate - Factory acceptance test report - Type test reports (as applicable) - Routine test reports - NDT reports - Coating reports	EN 10204 Type 3.1	EN 10204 Type 3.1 for pressure parts EN 10204 Type 2.2 for non-pressure parts
Flare tip / system	- Material test certificate - Pressure test reports - NDT reports - Factory acceptance test reports - Coating reports	EN 10204 Type 3.1	EN 10204 Type 3.1 for material in contact with process gas EN 10204 Type 2.2 for support structure
Packaged equipment / skid assembled equipment	- Factory acceptance test report - Certificates of each parts / bought out components	EN 10204 Type 3.1	Certification of individual items in the packaged equipment shall follow requirements of individual items specified in this table

Item	Required certificates or test reports	Type of certification required	Remark
Structure			
Special and first category structural steel	Mill test certificates	EN 10204 Type 3.2	Steel category defined in 10008-STD-6-OSS-007
Second category structural steel	Mill test certificates	EN 10204 Type 3.1	Steel category defined in 10008-STD-6-OSS-007
Equipment skid structure	Mill test certificates	EN 10204 Type 3.1	
Lifting Equipment (Refer Note 6)			
Lifting appliances (Crane, hoist, power winch, fork lift truck etc.)	- Proof load test certificates - Material test certificates - Functional test reports - NDT reports - Type approval test reports	EN 10204 Type 3.1	Load test shall be witnessed and certified by Independent Third Party listed in COMPANY approved list
Lifting gear (sling, sling fitting, shackles, ropes, beam, beam clamps, eyebolt, chain, sheave block, hook, jib, mooring chains, mooring wires etc.)	- Material test certificates - Proof load test certificates - Type approval test reports	EN 10204 Type 3.1 or Type 2.2	Load test shall be witnessed and certified by Independent Third Party listed in COMPANY approved list
Pad eyes and lifting lugs on equipment	- Mill test certificates - Load test reports - NDT reports	EN 10204 Type 3.1	All fixed lifting points forming part of equipment and package skids along with any loose lifting gear designed for routine handling of equipment during normal platform operation shall be subjected to trial lift prior to delivery
Davit, Lifeboat davit, Life raft davit	- Material test certificates - Load test report - NDT reports	EN 10204 Type 3.1	Load test shall be witnessed and certified by Independent Third Party listed in COMPANY approved list

Item	Required certificates or test reports	Type of certification required	Remark
Pipeline / Riser			
Pipeline / risers components such as line pipe, fittings, bends, forgings	• Mill test certificates • Pressure test reports • Heat treatment charts • NDT reports • Visual / Dimensional reports • Corrosion test reports	EN 10204 Type 3.2	
Subsea			
Subsea valve	• Pressure test / leak test report • Fire safe test report (as applicable) • ENP / Tungsten carbide coating reports (as applicable) • NDT reports • Coating reports • Mill test certificates	EN 10204 Type 3.2	
Subsea Multiphase Flow Meter	• Mill test certificates • NDT reports • Factory acceptance test reports • Other test reports as detailed in 10008-STD-6-SSE-030	EN 10204 Type 3.2 certification for pressure parts and Type 3.1 certificates for other parts	
Hydraulic Actuators	• Mill test certificates • Factory acceptance test reports • Other tests reports as specified in 10008-STD-6-SSE-036	EN 10204 Type 3.1 certificate for pressure containing and torque transmitting parts	

Item	Required certificates or test reports	Type of certification required	Remark
Subsea production facility (Christmas tree, jumpers, connectors including hubs and pup pieces, manifolds, umbilicals, turret, buoy, rigid / flexible riser, pressure vessel etc.)	• Mill test certificates • Other test certificates / reports as per applicable PEGS	EN 10204 Type 3.2 certification for pressure containing parts	
Electrical / Instrumentation			
Level gauges	• Mill test certificates • Functional test reports • Pressure test reports • NDT reports • Coating reports	EN 10204 Type 3.1	
Pressure Relief devices, Valves such as Relief / Safety valves, Shutdown / Blow down valves, ESDV, Control Valve, HIPPS valve etc.	• Mill test certificates • Pressure test / leak test reports • Calibration reports • Functional test reports • Coating test reports • NDT reports	EN 10204 Type 3.1	Body, bonnet, cover, flanges, closure member, stem, bellows, pup piece / transition piece - Type 3.1 Non-metallic parts – Type 2.1 Remaining parts - Type 2.2 ENP coating – Type 3.1 Tungsten carbide coating – Type 3.1
Instruments - Tagged or Bulk	• Relevant test reports • Certificate of compliance	EN 10204 Type 2.2 or 2.1	
Instrumentation items (Analyzers, flow meters etc.)	• Material test certificates of pressure parts • Calibration reports • Factory acceptance test reports	EN 10204 Type 3.1	Pressure containing parts shall have Type 3.1 certification
Electrical / Instrument Cable	• Factory acceptance test certificates for individual length • Type test certificates	EN 10204 Type 3.1	

Item	Required certificates or test reports	Type of certification required	Remark
Electrical Appliances and Fittings	- Factory acceptance test reports (as applicable) - Ex-Certificates for equipment in Hazardous Area (ATEX / BASEEFA / SIRA) - Certificate of conformance - Type test certificate (as applicable)	EN 10204 Type 2.2 or 2.1	
Coating / Civil			
Concrete for line pipe coating / civil works	Test reports	EN 10204 Type 3.2	
Passive Fire Protection, Insulation	Fire test certificate / report	EN 10204 Type 2.2 or 2.1	
Safety			
Firefighting and Safety Survival Equipment	- Certificate of compliance - Relevant test reports	EN 10204 Type 2.2 or 2.1	
Corrosion			
Sacrificial Anodes	- Mill test certificate of the steel used - Alloy analysis certificate - Electrochemical test reports - Visual / Dimensional test report - Certificate of compliance	EN 10204 Type 3.1	
Monolithic Insulating Joint	- Mill test certificates of pup piece and insulating material - Hydraulic test report - Electrical test reports - Coating reports - Qualification test reports	EN 10204 Type 3.1	

Item	Required certificates or test reports	Type of certification required	Remark
Spare Parts			
All	• Certificate of compliance • Material test certificate • Relevant test reports	"See Remark"	In general, type of certification for spare parts shall be agreed with COMPANY during placement of order based on the complexity of design and construction of particular product. In any case, minimum certification shall comply with "EN 10204 Type 2.1".

Notes:

- 1) Technical requirements pertaining to each product shall comply with relevant PEGS's.
- 2) For items not included in above table and not covered by any PEGS's, type of certification shall be proposed by CONTRACTOR and approved by COMPANY prior to placement of order.
- 3) All Mill test certificates shall be furnished from Manufacturer. Certificate from dealers or stockists are not acceptable.
- 4) All certificates / test reports shall be in "Original" or "Certified true copies". True copies shall only be certified by the holder of original certificate or by independent third party inspection agency as necessary.
- 5) All certificates / test reports shall be accompanied with proper traceability report / drawing.
- 6) All lifting equipment shall be inspected and certification provided as per applicable statutory requirements of the country of installation / use.

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