

Santos Specification

Title: Quality Requirements for Suppliers

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FOREWORD

Santos Quality Standards apply to all Santos facilities and are based on Australian Regulations and Standards. When applied outside of Australia, Local Regulations, Codes of Practice and Environmental Regulations shall take precedence.

The Santos Quality Standards are generated, implemented and reviewed in accordance with the Santos Engineering Management Standards (EMS).

Compliance with Regulations, Engineering Management Standards (1520-002-STN-0002 and 1520-002-STN-0004) and Engineering Standards is compulsory in accordance with EHSMS 02 and EHSMS 11.2. The current Santos Engineering Standards shall apply unless specifically stated within individual standards or when directed by the Custodian of the relevant Standard. Regulations may superimpose retroactive provisions.

Use of this Santos Quality Standard is MANDATORY. If any part of this Standard appears inadequate, unsuitable or not cost effective, consult with the Custodian to agree a suitable solution. This may result in a revision to the Standard.

Deviations from Santos Quality Standards shall be approved in writing via the Santos Engineering Standards Waiver process. Approval of waivers is vested in the Quality Manager or his delegate.

1 SCOPE

The purpose of this document is to define the minimum Quality Requirements prescribed by Company for equipment Supplier (Contractor).

The Supplier (Contractor) should refer to the equipment's functional specification(s) and/or Scope of work for any additional Project specific quality requirements.

This specification applies to all Suppliers (Contractors) providing equipment to Company.

2 STANDARDS, CODES OF PRACTICE, REFERENCES

Equipment shall conform to the requirements of the latest edition of the following standards and specifications, as applicable to the scope.

2.1 International Standards

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|--|--|
| ISO 9001 | Quality Management System |
| ISO 29001 | Petroleum, petrochemical and natural gas industries — Sector-specific quality management systems — Requirements for product and service supply organizations |
| API SPEC Q1 | Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry |
| BS EN 10204 | Metallic Products – Types of Inspection documents |
| DNV Standard for Certification No.2.7-1 | Offshore Containers |
| DNV Standard for Certification No.2.7-2 | Offshore Service Containers |
| DNV Standard for Certification No.2.7-3 | Portable Offshore Units |
| DNVGL-ST-N001 | DNVGL Marine Operations and Marine Warranty |
| ASME B31.3 | Process Piping |
| ISO/IEC 17025 | Testing and calibration laboratories |
| AWS D1.1 | Structural Steel Code |
| ISO 9712 | Non-Destructive Testing – Qualification and Certification of NDT Personnel |

2.2 Santos Standards

| | |
|-----------------------|------------------------------|
| SMS-HSS-OS02- PD03 | Lifting Operations Procedure |
|-----------------------|------------------------------|

Alternative Standards or Codes of Practice other than those listed above may be allowed by approved exception.

Exceptions to all specifications and standards shall be stated in tender documents, proposed alternates shall be clearly identified.

Revisions to all documents and drawings shall be clearly identified by revision number, and date, and by revision bar in text or by clouding on drawings.

3 QUALITY SYSTEM REQUIREMENTS

The Supplier shall operate a Quality Management System accredited to ISO 9001 and in compliance with ISO 29001, or API-Q1, relevant to the Works.

The Supplier is totally responsible for the Quality of the applicable contract/purchase order including all sub-suppliers.

The Supplier is responsible for ensuring that sub-suppliers have a quality system in place which satisfies the requirements of the appropriate ISO 9000 series standard for goods and/or services supplied.

Alternative standards may be acceptable. Suppliers who work in accordance with other recognised quality standards should submit details to Company for review and clarification to determine if acceptable to Company standards.

The effective implementation of the quality system must be demonstrated by one or more of the following:

- Accreditation by a third party,
- Satisfactory audit by a major client to Company satisfaction,
- A proven internal audit program, and a system of management review that meets the requirements of the nominated quality standard,
- In the case of ISO 29001, a quality plan that demonstrates the requirements have been incorporated.

4 QUALITY PLAN AND INSPECTION AND TEST PLAN

4.1 Quality Management Plan

Where required within the Supplier Data Requirement List (SDRL), a Quality Management Plan (QMP) shall be submitted to Company for review and approval. The QMP shall reference the following:

- Quality objectives to be obtained during the lifetime of the project,
- The specific allocation of roles, responsibilities, and authorities during each phase of the contract,
- Project specific organisation chart defining the interrelationship of personnel employed, and sub-suppliers,
- Details of the interface between Company and Supplier's personnel,
- Details of how all-relevant aspects of the Supplier's quality system shall be applied to the contract,
- Index of procedures and work instructions, including those specifically prepared for the contract,
- List of approved sub-suppliers and their nominated quality system standards, details of how quality will be managed for the sub-supplier's scope of work, and Supplier's proposed inspection levels, and
- Process flow for Non Conformances and/or Corrective Actions, including project specific assignment of Minor and Major definitions.

4.2 Inspection and Test Plan

The Supplier shall develop and implement Inspection and Test Plan(s) (ITPs) to cover all phases of the contract from design, through manufacturing, testing, installation, and commissioning.

ITPs shall include any specific inspection requirements called up in the Company functional specifications and /or scope of work.

Third party Independent Verification Body (IVB) and Company Inspection 'hold', 'witness' monitoring and 'review' points shall be agreed at final submission of ITP and must be strictly adhered to.

The Supplier shall give Company's nominated inspector/ Representative the agreed period of notice of an impending witness or hold point; and, in the case of a hold point, shall not proceed without the IVBs and/or Company representative presence or written instruction to waive hold point.

All ITP's shall be submitted, reviewed, and approved by Company before manufacture starts. Products manufactured and offered for inspection prior to the submission and approval of an ITP may be rejected by Company.

A standard format for ITPs is provided in Appendix A. The Supplier may choose to utilise their own format, provided it contains all information as per the format in Appendix A.

Company defines intervention points as follows:

Hold (H) Intervention point requiring fourteen (14) days' notice of impending activity. Activity shall not proceed without Company and IVB(s) presence at the activity, without written consent to waiver this intervention point. The attending inspector for the relevant party (Company, Supplier or Sub-supplier) shall sign the verifying record(s) as correct at immediately following completion of inspection or test.

Witness (W) Intervention point requiring seven (7) days' notice of impending activity. Activity may proceed should Company and or IVB(s) not attend on due date and time or written consent to waiver this intervention point. The attending inspector for the relevant party (Company, Supplier or Sub-supplier) shall sign the verifying record(s) as correct at immediately following completion of inspection or test.

Monitor (M) Intervention point requiring no notification of activity. Company representative shall carry out inspection and review of test documentation during their routine inspection visits. Supplier and Company representative shall coordinate these activities.

Review (R) Intervention point requiring no notification of activity Company representative shall carry out review of documents and test results during their visit. Documentation shall be made available upon request.

Approve (A) Indicates that the document deliverable or test record requires approval by the particular party. If a test record, this means signature by the inspector on the test record immediately following results being recorded on the test record.

4.3 Pre-Inspection Meeting

A Post Award Pre-Inspection Meeting (PIM) shall be conducted at an agreed time and date at the Supplier's works or at a mutually agreed location. Supplier's inspectors and Supplier's personnel related to the works to be performed (e.g., supervisor, foremen), shall attend the PIM.

Supplier shall provide as much notice as practicable to allow Company attendance, however at a minimum fourteen (14) days' notice shall be provided.

The Company assigned inspector shall attend the meeting as one of the Company attendees and shall have a brief rundown of their duties and establish contact details with the supplier.

A Pre-Inspection meeting agenda provided in Appendix B is to be used as a guideline for this activity.

Minutes of Meeting shall be produced by the Supplier and agreed with Company within forty-eight (48) hours of the meeting.

5 TECHNICAL DEVIATION REQUESTS AND QUERIES

The Supplier shall use Company Technical Query Form for all requests for technical deviations, clarifications, or concession requests to Company specifications and or scope of works.

Written Instructions for use and numbering of the Technical Query Form are as an attachment to the form.

Supplier shall submit Technical Query's to Company for review and approval. Activities relating to the Technical Query shall not proceed until the Technical Query has been approved by Company.

Supplier shall make available for Company review as and when requested by Company, access to Supplier's change management system.

6 COMPANY AUDITS

Company may conduct compliance audits at the Supplier's works or main manufacturing works. Where necessary all audits will be carried out at a mutually agreed time and date to suit all parties.

The purpose of the audit will be to verify the adequacy and implementation of the Supplier's Quality Management System to the contract/Purchase Order and the works being performed.

Any Company findings will be provided to Supplier, and Supplier shall provide a proposal to address findings within seven (7) days.

7 VALIDATION AND INDEPENDENT VERIFICATION

7.1 Validation

Company's activities are governed by a Safety Case regime. Prior to submitting a Safety Case, a Scope of Validation is required and must be agreed between the Operator (Company) and the Safety Authority (Regulator). In addition, as a condition of Regulator acceptance of a Safety Case, a Validation Statement is required from an independent Validation body that focuses on the safety-critical hardware, firmware, and software.

Company shall appoint the Validation Body for the Project.

Supplier shall afford unrestricted access to data in accordance with the Regulatory requirement, and shall submit this data to the Validation Body and respond to queries/comments to the satisfaction of the Validator in a timely manner so as not to jeopardise Company's Safety Case approval.

Supplier shall not deviate from any of the design codes and standards included in the Scope of Validation without Company's written approval.

For equipment entering other jurisdictions (for example Timor-Leste Offshore Waters), then the Supplier shall ensure their equipment complies with the requirements under that jurisdiction.

7.2 Independent Verification

Supplier shall engage a recognised Independent Verification Body (IVB) and complete all verifications required under the Written Verification Scheme (WVS) as applicable to their scope. All Supplier's deliverables identified as requiring IVB verification in the SUPPLIER DOCUMENT RECORD LIST shall be reviewed and approved by Supplier's IVB. The IVB's review and approval shall be readily identifiable and accessible to Company and Company's IVB. Supplier's IVB shall attend all required manufacture and testing to complete all Verifications under the WVS.

Company may elect to engage a project IVB to verify design, fabrication, installation, testing, pre-commissioning, and commissioning of the equipment identified as SCEs, in accordance with the agreed project Performance Standards, codes and standards, and specifications, in order to support Company's implementation of the WVS. Company IVB may review some of Supplier's deliverables, and/or appraise records from Supplier's IVB, such that credit can be taken for verification undertaken by Supplier's IVB and avoid duplication. The documents subject to review and/or appraisal by the Company IVB will be indicated in the SDRL. Supplier shall make provision for the inclusion of Company IVB's comments into the relevant deliverables. Review and/or appraisals by the Company IVB will be conducted in parallel with the Company's reviews. The Company IVB comments will be consolidated by Company and issued to Supplier for resolution, response, or clarification. Should a non-conformance with the WVS be detected, then that non-conformance shall be addressed and corrected by Supplier, regardless of the document status and/or revision.

For equipment entering other jurisdictions (for example Timor-Leste Offshore Waters), then the Supplier shall ensure their equipment complies with the requirements under that jurisdiction.

In order to support Company's implementation of the WVS, Contractor shall:

- Answer all comments raised by the Company IVB in a timely, accurate and complete form,
- Inform Company and Company IVB of all packages where Contractor will utilize subcontractor services and provide the detailed scope of work to Company for review and approval,
- For those packages identified as requiring Company IVB worksite or site attendance, provide minimum fourteen (14) day notice to Company to enable the mobilisation of the Company IVB Representative.

Supplier shall bear all costs associated with providing necessary support services and complying with the requirements and recommendations of the Company IVB including response to queries.

8 NON-CONFORMANCES

All Suppliers non-conformances that may have an impact on the final product must be reported immediately and shall be submitted to Company, together with the suggested

corrective action with the preventative action in order to prevent re-occurrence, for review and approval.

Supplier shall develop a register of all NCRs and identify the status of the NCRs, the register shall be made available upon request, however it shall form part of the Suppliers monthly report.

Company signed NCRs and register shall be included within the MDR at completion of scope of work.

Where Company issues NCRs via its web-based NCR database, Supplier shall ensure they respond to the NCR with a proposed corrective and preventative actions within seven (7) days of receipt.

9 MATERIAL AND FABRICATION REQUIREMENTS

All materials shall comply with the requisite of code requirements, as defined within this document in addition to those within the project specific Functional Design Specification (FDS), and the PO Functional specification.

9.1 Material Certificates

Material test certificates for all materials and consumables used for hydrocarbon containing, pressure retaining parts or primary and secondary structure shall be in accordance with Appendix D – Marking and Material Certificate Requirements, unless otherwise specified in the Purchase Order.

9.2 Material Traceability

Supplier shall operate a material traceability system, to record where individual material has been use, throughout the fabrication process, which will be detailed in their Quality Plan.

9.3 Qualification Testing - Forgings

Sample for production testing, shall realistically reflect the properties and mass of the finished product, as a prolongation or a sacrificial sample, of same size and mass. Mechanical test samples shall be taken in accordance with relevant pipe, fitting, or forged component standards.

9.3.1 Test sampling of forgings and Hot Isostatic Pressed (HIP) components

A test lot shall contain components of the same type, manufactured according to the same manufacturing method, from the same heat of steel and heat-treatment load.

The test sample shall be selected from the component having the heaviest wall thickness within the lot.

The test sample shall be taken from a sacrificial component or from a prolongation at one of the following:

- at a cross-section thickness, T, representing the area of the part with maximum stresses, e.g., the welding end, at mid-wall and at least T or 50 mm (2 in), whichever is more, from the end face,
- at the heaviest cross-section, T, of a product, at least T/4 below the surface and at least T or 100 mm (4 in), whichever is less, from any second heat-treated surface.

For hot isostatic pressed (HIP) manufactured products, integral test blocks shall be made. These shall not be parted from the HIP component until after all heat treatment is completed.

All mechanical testing shall be performed after final heat treatment of the product.

All sampling of test material and mechanical testing, shall be witnessed by Company representative.

9.4 Mechanical Testing

Mechanical Testing of welding procedure qualification and critical materials used for permanent works, shall be performed in an approved laboratory who are accredited to ISO/IEC 17025.

9.5 Positive Material Identification

Positive Material Identification (PMI) is used to ensure that the nominal chemical composition of metals conform to the material grades specified. This minimizes the potential for failure of equipment and components.

9.5.1 Extent of PMI

Supplier shall perform PMI on all pressure containing alloy materials and all associated welds.

Non-pressure containing alloy materials and all associated welds that are in contact with a process medium shall be treated the same as a pressure containing material.

Where identified as a requirement, PMI of materials shall be performed for each heat, supplier, and type, and documented by Supplier during fabrication at their works or upon receipt of bulk materials and on receipt of completed equipment or assembled parts from sub-suppliers.

Supplier shall perform PMI at receipt inspection stage or during the appropriate manufacture or fabrication stages to ensure that only verified materials have been used in fabrication and final assembly of items. Where Supplier takes receipt of packaged equipment that includes alloy materials, the Supplier shall perform a random 10% PMI verification check.

The chosen method of PMI shall not damage or leave un-repairable damage to the material being tested.

PMI shall be included on the Supplier ITP for Company to mark-up necessary witnessing.

9.5.2 Test Procedure

Supplier shall submit a PMI procedure addressing all test equipment, testing methods, operators, marking and blank test report forms.

9.5.3 Shop Fabrication PMI Form

The PMI form for shall contain the following information as a minimum:

- Name of Subcontractor/Supplier
- Suppliers P.O./ Subcontract number
- Item number and name of the fabricated equipment and piping
- Location where the test was undertaken
- Date of examination
- Name and signature of examiner
- PMI method/instrument used
- Listing of items with reference to the fabrication drawings/ spool drawings
- Type of alloy examined
- Conclusion (i.e., "Accept" or "Reject")

- Mill certificate reference number & heat number
- Number of pieces, items examined
- PMI machine printout.

9.5.4 Examination Methods and Instruments

Supplier shall ensure they can perform PMI utilising the following equipment;

- Portable X-ray fluorescence spectrometers with direct reading of alloy grade or composition in the applicable range are generally acceptable.
- Portable arc-emission spectrometers with direct reading of alloy grade or composition in the applicable range are generally acceptable.
- Fixed laboratory optical emission spectrometers may also be used where it can be demonstrated that “cut off” samples are adequately traceable to the original heat and batch.

PMI Examination shall not be carried out with chemical spot testing or methods that use eddy current, triboelectric testing, electromagnetic, or thermoelectric tests.

All materials shall be made good after examination e.g., by dressing out arc strikes.

9.5.5 PMI Operators

Supplier shall ensure PMI operators have received training demonstrating ability and experience with the PMI equipment and testing procedure. Records of training shall be made available to Company upon request.

9.5.6 Rejection

Whenever material is identified as incorrect, the option is given to perform a more accurate test to verify the material composition or to reject the material. Where any material is found to be unacceptable after re-test it shall be rejected including other materials from the same batch, heat, or type. Rejected material shall be suitably marked and segregated. The marking shall spoil any existing marking or colour-coding to prevent accidental re-supply of the rejected item.

If a weld fails PMI, remaining welds in the piece of equipment or piping shall receive PMI. Additionally, other equipment or components being fabricated by that same Supplier using the same welding procedure qualification in the same shop location shall be reviewed for need of additional PMI. The required actions shall be approved by Company.

Supplier shall inform Company immediately upon detection of rejected materials.

10 WELDING

10.1 Welding Procedures

Welding Procedure Specifications (WPSs) shall be qualified in accordance with the relevant International Code and Standards specified within Company Functional Specifications.

Mechanical Testing for welding procedure qualification, shall be performed in a NATA approved laboratory when in Australia, or a laboratory who are accredited to ISO/IEC 17025, outside of Australia.

Previously qualified WPS witnessed by an independent inspection or Certification Authority shall be considered for approval at the discretion of Company. Pre-qualified WPS as defined by AWS D1-1 shall generally not be acceptable.

10.2 Welder Qualifications

Welders and welding operators shall be qualified in accordance with the relevant code of practice specified within the PO Functional Specification and relevant codes and standards.

Existing welder qualification may be accepted by Company provided that certification is current, and the welder has been employed as a welder within the last 6 months, RT or UT evidence is available, as back up and is acceptable to the relevant, codes and standards.

Company reserves the right to reject proposed welders/welding operators regardless of certification level, if their qualifications cannot be demonstrated to be in accordance with the requirements stated above, Company reserves the right to request additional qualification testing, or removal from Company work, should welders repeatedly produce, defective welds.

10.3 Welding Process Control

Supplier shall maintain a welding management system which defines quality requirements for fusion welding of metallic materials. It shall include welder and weld tracking data that includes weld repair statistics, welder statistics and ability to analyse data for trends. It shall be made available to Company for review upon request.

Supplier shall ensure that Daily Weld Records (DWR) are prepared and signed by Supplier's welding inspector. As a minimum the DWR should contain;

- Drawing Number
- Line Class / Structure
- Welding Date
- Joint Number/Identifier
- Joint Type (Butt/Fillet/Socket)
- Welding Place (Shop/Field)
- Welder Number (Root/Hot/Capping Pass)
- Welding Consumable batch certificate reference
- Size and Thickness
- Heat Number
- Name of Preparation (Piping Foreman)
- Name of Checker (Piping SV/QC)

10.4 Welding Inspectors

Supplier Weld Inspectors shall have at least five (5) years welding QC experience in the oil and gas industry. Supplier's Weld Inspectors shall have, and maintain, current certification, as a minimum, to either;

- CSWIP 3.1 Welding Inspector under CSWIP certification scheme,
- International Welding Inspector Basic (IWI B) under IIW certification scheme, and
- WTIA Certified Welding Inspector (CWI) under WTIA certification scheme.

Use of inspectors with the following qualifications shall not be acceptable for welding inspection, and shall deem the inspection result null and void;

- CSWIP 3.0 Visual Welding Inspector Level 1.

10.5 Weld Repairs

Where required by Code or Specification weld repair procedures shall be qualified to address full penetration (weld excavated through the root pass), partial penetration (Weld metal

excavated to a maximum of a 3mm remaining ligament) and multipass cap repair (removal of surface layer of the weld metal that overlaps the base metal).

Before any Piping, Vessel or Primary Structural weld repairs are commenced, a written repair instruction shall be submitted to the Company for approval.

The instruction shall describe in detail the sequence and methods of performing a weld repair, including:

- Maximum repair length acceptable,
- Acceptable weld repair locations and permissible distance between repairs,
- Locating and marking of weld repair area,
- Method of securing, supporting, restraining during repair,
- Method of removing defect, cleaning, weld groove / joint preparation and run-in and run out requirements,
- Method of NDT to confirm complete removal of defect,
- Method of preheat and temperature control and any PWHT,
- Method of welding and final NDT of repaired joint,
- Any post weld blending requirements, and
- Cut-out / re-repair options and procedures.

Company shall be notified of all weld repairs, along with the supporting weld repair authority within 24hrs of defect reporting. The Company shall be given the option to witness the repair process by providing at least 48hrs notice, or as agreed between both parties.

Only one attempt at a repair may be conducted without written approval by the Company, after which Company reserves the right to request the removal of the heat affected zone after an unsuccessful attempt of a defect removal or repair.

11 NDT

11.1 NDT Procedures

The suppliers NDT procedures and acceptance criteria shall be applicable to the work, and in accordance with the codes and standards, used to produce the weld.

The supplier shall submit NDT procedures for Company review and acceptance, prior to starting work. Each procedure shall as a minimum, contain the following information:

- Title,
- Procedure number, revision, date,
- Author and job title,
- Personnel qualifications, certification requirements etc.,
- Applicable codes and standards,
- Equipment, selection criteria for equipment variables, calibration method and frequency,
- Technique to be used (UT, X-Ray, gamma etc.),
- Consumables to be used (manufactures name, grade etc.),
- Procedure details and work instructions,

- Test restrictions, procedure deviations,
- Relevant technique diagrams,
- Reporting requirements and format, and
- In the event of a weld repair, the contractor shall submit a repair procedure and NDT methodology with the relevant WPS and WPQR attached for review and approval by the Company.

11.2 NDT Reports

All NDT reports shall be written in the English language and shall contain all the information specified in the applicable industry standard and NDT procedure.

All NDT reports issued shall be endorsed by a competent person suitably qualified to that level.

All NDT reports performed using Automated Ultrasonic Testing (AUT) reports shall be submitted with all associated computerized data to Company.

Supplier shall be required to review, and stamp reviewed on all NDT reports.

11.3 NDT Personnel

NDT operators should be certified in accordance with the applicable CSWIP-PCN document to a minimum level of PCN level 2. Documentation in support of this qualification shall be available for Company and Third Party Inspector review on request.

Alternative certificate schemes may be accepted by Company as follows:

- Operators certified to ISO/TC135/SC7 or ISO 9712 level II,
- Operators qualified to the AINDT scheme, at technician level shall be deemed acceptable on a case by case review of resume and certificates
- ASNT level II operators certified to the supplier's or sub-supplier written practice complying with SNT-TC-1A, may be considered for performing and reporting Radiography, MPI and DPI methods, subject to an independently certified NDT Level 3 providing of all NDT procedures, and supervision and oversight of all non-destructive testing during fabrication and construction activities, the level 3 shall sign off on all reports performed by the level 2 operator. The use of level I operators for defect detection, and level II for evaluation only is not permitted.

Company reserves the right to accept or reject proposed NDT operators, regardless of certification or qualification levels, should work prove to be deficient. Company reserves the right to cross check suppliers work, with their own independent qualified cross checkers.

Australian NDT Companies shall be NATA approved. All international NDT companies shall be ISO/IEC 17025 accredited, or be required to have a gap analysis of their system against ISO/IEC 17025, with any deficiencies rectified prior to commencing works.

11.4 Techniques

Radiography shall comply with the requirements of ASME V or DNV OS F101, applicable to the scope of work and this document. Conflicting requirements shall be confirmed in writing.

Radiographic techniques shall provide for sufficient exposures to be taken to ensure that a radiograph representing any portion of the weld complies with this requirement.

Consideration should be given to close proximity and safe shielding radiography methods, where less restrictive barriers are required.

11.4.1 Identification of radiographs

Lead letters and numbers used to identify radiographs and their location shall be a maximum of 6mm high and 50mm spacing. Identifiers shall not mask any portion of the weld.

Films shall be marked, as a minimum, to indicate:

- Project / Job number,
- Unique weld number,
- Relative position to data mark,
- IQI, and
- Date - when time lapse is specified.

11.4.2 Sensitivity

A minimum of one wire type image quality indicator (IQI) shall be used on each film exposure, with the IQI positioned;

- Single Image – 3 IQI's spaced equally apart throughout the circumference
- Double Wall Single Image – at R/H edge of the film interval
- Double Wall Double Image – in the centre of the Weld Image
- Film sensitivity shall be in accordance with ASME V and assessed on a single wall thickness plus weld reinforcement as applicable.

Combined weld reinforcement (internal plus external) shall be considered as 2mm for thickness less than or equal to 6mm; 3mm reinforcement for all thicknesses greater than 6mm unless physically confirmed in each instance.

11.4.3 Density

The minimum radiographic density in the weld area shall be 2.0. The maximum radiographic density shall be 4.0 for all areas of the weld including parent material. Where excess penetration affects the weld metal density, it shall be the welding contractor's responsibility to rectify so radiographic density is not affected by excessive penetration.

11.4.4 Screens

Only lead intensifying screens shall be used. 0.125mm front and back for loose leaf film and 0.027mm front and back for "Rollback" or "Vacupac" film. Screens shall be placed to prevent radiation scatter affecting film exposure. Where films are in close contact to the ground or adjacent structure / material, a lead indicator "B" shall be placed on the back of cassettes / film to determine the effect of back scatter. DWD techniques shall require the inside diameter pipe wall tangents to be visible to determine the effect of any side scatter.

11.4.5 Interpretation

Weld interpretation shall include indications 10mm on either side of the weld.

11.5 Digitalisation of Radiographic Films

Supplier shall provide RT films in digital form to Company. Handover structure, report numbering and format, and staged submittal of records during progression of works shall be as agreed by Company and Supplier, and in a suitable format.

12 HEAT TREATMENT AND PWHT

Post weld heat treatment (PWHT), when required, shall be conducted in accordance with an approved PWHT procedure based on the thermal cycle qualified in test welds, or QTC's in

order to verify sufficient hardness can be maintained after the thermal cycle(s), or QTC's in order to verify sufficient hardness can be maintained after the thermal cycle(s).

Post weld heat treatment shall be carried out as soon as practical after completion of all welding; including that associated with structural attachments.

Procedures shall be developed by Supplier and approved by Company prior to implementation. Procedures shall identify;

- Attachment of thermocouples: thermocouple placement shall be representative of thickness of the work to be heat treated, they shall record thickest and thinnest, members being treated,
- Location in the furnace relative to burners / elements,
- Method of support,
- Insulation,
- Method of heating, and
- Thermal cycle.
- Stress relief of carbon manganese materials shall require a thermal cycle of:
- Maximum rate of heating above 300°C shall be 150°C per hour for thicknesses less than or equal to 32mm. Thicknesses above 32mm will require a maximum heating rate (degrees C per hour) of 5000 divided by maximum thickness in millimetres,
- Holding Temperature shall be 590 to 620°C,
- Holding Time shall be calculated at one hour per 25mm or part thereof, and
- Cooling Rate above 400°C shall be 200°C per hour. Thicknesses above 32mm will require a maximum cooling rate (degrees C per hour) of 6250 divided by maximum thickness in millimetres.

Components shall be continuously recorded whilst the temperature exceeds 200°C.

Wherever possible, post weld heat treatment shall be carried out in an enclosed furnace. Localised PWHT shall be restricted to site works and special applications.

If PWHT in an enclosed furnace is not practical, local PWHT shall be performed by means of electrical resistance heating mats (Bands). Bands shall cover over the entire length of the weld, the band shall be centred on the weld and the width of the heated band shall not be less than 5 times the thickness of the thicker component in the assembly.

Temperatures shall be measured by thermocouples in effective contact with the material, at a number of locations to monitor the whole length of the weld is heated within the specified temperature range. Temperature recorders with a temperature chart shall be used to produce a permanent record which shall form part of final certification.

Insulation shall be used when using resistance heating mats, insulation shall ensure that the temperature of the weld and the HAZ is not less than the temperature specified in the pWPS or WPS.

The use of manually operated gas torches, gas rings or exothermic kits shall not be permitted.

Furnace fired components shall require a minimum of two thermocouples to be attached to the thickest and thinnest sections in the heat. Placement shall be diagonally opposed where possible and at outer extremities.

NDT shall be carried out after PWHT, to the extent of 100% Radiography or 100% UT and MPI. NDT technique shall be agreed with Company.

13 VALVE AND FLANGE MANAGEMENT

Where a Contractor's work includes Valve and Flange Management, Contractor shall submit to Company for review a valve and flange management procedure. The valve and flange management procedure shall include as a minimum;

- Training and competency requirements for the workforce,
- Contractor's definition of low, medium, and high criticality flanges and valves,
- Contractor's verification requirements for low, medium, and high flanges and valves,
- Specific torquing requirements,
- Recording requirements for low, medium, and high criticality flanges and valves, and
- Flange Management Template.

14 ELECTRICAL AND INSTRUMENTATION

Where Supplier's Work include Electrical and/or Instrument scope, they shall ensure that all electrical, instrumentation design and installation meet the requirements specified within Company Functional Specifications.

Supplier shall identify within the Quality Plan how they are to control E&I work and how they track the scope from installation, calibration, and pre-commissioning.

Supplier shall submit a copy of their procedures and standard test records prior to work commencing for all stages of the E&I scope of work.

Supplier shall propose an Inspection and Test Record in accordance with IEC 60079, for Company review and approval, that captures all EEHA installation requirements. Completed EEHA records shall be made available to Company as Work progress. Supplier shall maintain and update this dossier progressively throughout the installation and inspection process.

Suppliers inspectors and workforce involved in EEHA installations for the Works, including both installers and supervisors, shall be demonstrably proficient in the installation standard that the Works are conducted to, being either AS/NZS 60079 or IEC 60079 Series.

Supplier shall keep competency certification records of all of its installers and supervisors, to perform the relevant Hazardous Area installation. The Supplier shall engage a representative of the cable gland manufacturer, to conduct training and competency assessment for the applicable type of gland and cable combination used during manufacture. After completion of the assessment only personnel deemed competent can conduct installation work.

No terminations, cable entry or jointing of electrical and instrumentation shall be carried out by non-qualified personnel. Company reserves the right to reject and have reworked at no additional cost if the work does not meet the relevant Standard or is performed by non-qualified personnel.

Supplier's inspectors involved in verification and installation of hazardous area electrical equipment, shall be competent in accordance with AS/NZS 4761.1, IECEx CoPC or CompEx respectively, and shall be delivered by an accredited third party approved by Company. Supplier shall maintain records of competence, and include these within the EEHA Verification Dossier, which shall include a unique identifier to the inspector, installer, or supervisor for traceability to installation and testing records.

Supplier shall ensure that any personnel competencies be re-assessed by an accredited third party, should their previous competency assessment be five (5) years or older during the period of Work being performed.

All Supplier installers and inspectors of instrument tubing for the Works shall have undertaken vendor specific training for the tubing type being installed.

Instrument disassembly checks shall be performed by the Supplier prior to FAT and witnessed by Company. Instrument disassembly checks shall be included in the Supplier's ITP as a separate line item. This check shall initially be performed on 5% of the total number of fittings within that scope of the package. Where defects are found as a result of the disassembly checks, the checks shall be increased to 10%. Should further checks identify further defects, then the entire Work shall be checked and rectified. Following completion of checks, the fittings shall be made compliant again, and the checks documented and provided to Company.

Supplier shall have a process for documenting all disassembly check results, including defects and rectification. This shall be made available to Company at any time.

Records of disassembly checks shall be provided in the Supplier's MDR.

Instrument tubing shall be made up using the Vendor's high pressure setting tool (HPST). Where Company finds works performed using other methods, then the entire work scope performed shall be condemned and rectified by Supplier.

15 COATINGS

Supplier shall comply with the project specific Functional Design Specification (FDS), PO Functional Specifications.

Suppliers shall submit their Paint and Coating Procedures to Company for review and approval.

Coating systems shall be Qualified, in accordance with the requirements referenced codes and standards, for the applicable application, suppliers shall supply Coating System Product Data Sheets and proof of prequalification.

All Supplier Coating Inspectors shall be certified to a minimum of NACE Level 2, with five (5) years coating QC experience in oil and gas projects.

16 INSULATION

Supplier shall comply with the project specific Functional Design Specification (FDS), PO Functional Specifications.

Supplier shall ensure it verifies and records application of each layer of insulation, including confirmation of bonding and curing prior to next layer application proceeding.

Supplier supervision and quality inspection personnel shall maintain a high focus on geometrically complex areas (i.e., bends, trunnions, reducers & tee sections) where the most significant insulation installation failures occur.

Supplier shall generate ITPs in accordance with specification requirements and work method statements. These ITPs shall include intervention points for the insulation supplier.

Company reserves the right to have conducted destructive testing of insulation where evidence of improper installation, application, or control of insulation activities in any Worksite are identified. Company will provide basis for requesting destructive testing.

All Supplier Insulation Inspectors shall be certified to a minimum of ICorr Level 2 with five (5) years coating QC experience in oil and gas projects.

17 LIFTING POINTS AND LIFTING APPLIANCES

All Lifting Appliances and lifting points used for carrying out lifts have the potential to be a MAE's, therefore lifting equipment and lifting points are likely to be subjected to Validation.

For equipment to be transported and lifted onshore, all lifting points and lifting appliances and equipment shall be designed, fabricated load tested and certified in accordance with Company's Lifting Operations Procedure.

Load testing shall be carried out and witnessed by an approved Independent Test Body. All lifting devices shall be marked with its Safe Working Load and shall be certified in accordance with DNV rules for Certification of Lifting Appliances. All lifting points and structure associated with lifting points, shall be subject to pre- and post- load test NDT. These records shall be included in the MDR.

For equipment to be transported and lifted offshore, all lifting points and lifting appliances and equipment shall be designed, fabricated load tested and certified in accordance with Company's Offshore Division Lifting Equipment Management System (LEMS), the following standards (as applicable) shall be used to for offshore lifts.

- DNV Standard for Certification No.2.7-1 Offshore Containers as defined for use as an offshore container being a portable unit with maximum gross mass not exceeding 25 000 kg for repeated use in transport of goods or equipment, handled in open sea, to, from or between fixed and/or floating installations and ships.
- DNV Standard for Certification No.2.7-2 Offshore Service Containers as defined for use as an offshore container built and equipped for a special service task, mainly for temporary installation. (Examples are, laboratories, workshops, stores, power plants, power plants, control stations, well logging, workover, and intervention equipment).
- DNV Standard for Certification No.2.7-3 Portable Offshore Units as defined for use as a Portable Offshore Unit as a package or unit intended for repeated or single offshore transportation and installation/lifting, governed by the Standards Type groups. Portable Offshore Units may also be designed for subsea lifting with the maximum gross mass not exceeding 100 tonnes.
- DNVGL-ST-N001 Marine Operations and Marine Warranty shall be used in relation, to controlled lifting operations for onshore, inshore, and offshore, with objects which the above Standards do not apply, it is the responsibility of suppliers to agree with Company which Standards are applicable for their Scope of Work and meet Company commitments for the Installation of subsea equipment.

In general, these Standards comply with Company's Offshore Division Lifting Equipment Management System (LEMS), which is included as part of the Contract/PO, this does not preclude the responsibility of supplier to read and comply with its requirements.

Supplier inherent lifting points which do not comply with the above requirements, shall supply for offshore transportation, adequate pre-slung lifting equipment i.e., containers, baskets etc. which does comply with these requirements. Lifting points which do not comply with Company requirements are to be marked "Not for Offshore Lift".

For all lifting devices / lifting points (regardless of onshore or offshore service), load testing shall be carried out and witnessed by an approved Independent Test Body. All lifting devices shall be marked with its Safe Working Load and shall be certified in accordance with DNV rules for Certification of Lifting Appliances. All lifting points and structure associated with lifting points, shall be subject to pre- and post- load test NDT. These records shall be included in the MDR.

Supplier shall prepare and supply an electronic copy of a lifting (rigging) appliance register, complete with copies of all certifications.

For permanent lifting devices/equipment, certification shall be included within the MDR and in addition, a copy shall be transmitted to Company.

Certification for all offshore lifting devices/equipment shall be copied and accompany the device/equipment to the designated Installation contractor, carrying out the offshore lift.

18 PRESSURE TESTING

All pressure testing shall comply with the requisite of code requirements, the project specific Functional Design Specification (FDS), this document and the PO Functional specification.

All pipework shall be subject to hydrostatic or pneumatic testing as determined by the product service. Type of test and pressures shall be stated on drawings or otherwise advised in writing.

Test equipment shall have been calibrated by a laboratory who are accredited to ISO/IEC 17025 within the previous six months.

Gauges shall have a full scale deflection of 1.5 to 3.0 times the test pressure.

18.1 Hydrostatic Testing

Hydrostatic pressure tests shall be recorded with a test gauge and chart recorder. The chart recorder shall record pressure and temperature for the duration of the test.

Test pressures and medium (including corrosion inhibitors) shall be confirmed prior to testing and MSDS sheets for any inhibitors and additives.

Spool identification, date, test fluid and signature of Supplier's inspector shall be written on each test chart and/or report.

When required, Test packs shall be prepared by the Supplier for installed piping systems prior to testing. Test packs shall contain P&ID's, isometric drawings, checksheets and data sheets relevant to each test section.

Test packs shall identify limits of each test and the locations for test equipment. P&ID's, Isometrics and General Arrangement (GA's) drawings may be used for this purpose. Any precautions required for testing shall also be stated (additional supports and status of inline equipment required during test).

An adequate supply of potable water at a temperature not less than 7 °C shall be provided for testing. The source of the water shall be approved by Company. When required by Company, the water shall be treated with a corrosion inhibitor.

In addition to the requirements above, water to be used for flushing and testing stainless steel/ duplex piping shall be demineralised and contain less than 20 ppm chlorides. The test water shall come with a Test Water Quality Certificate.

Each piping system shall be completely drained within 24 hours after testing and dried with air to remove all free water remaining after the pressure test.

18.2 Pneumatic Testing

Pneumatic testing shall only be carried out in agreement with Company.

All piping installations subject to pneumatic testing shall be conducted by a NATA endorsed pressure test engineer.

Written procedures for pneumatic testing shall be approved by Company prior to any testing taking place.

Testing area shall be cordoned off, in accordance with the stored energy calculation, and due account taken of other activities in the proximity to ensure safety of personnel and equipment. Should the calculation determine an area too large to be practical, then alternatives must be implemented. During the test only authorised personnel are allowed within the testing area limits.

Pneumatic testing shall be done with air unless specific systems require other inert gases. The air for testing and cleaning shall be free of moisture and oil. Use of any gas other than air shall be approved in writing by Company before testing.

The internal surfaces of the piping to be tested shall be inspected for cleanliness before the pneumatic test is started.

Flange joints shall be taped with water repellent tape around the circumference to seal the flange gap. A small leak testing hole shall be punched through the tape at the top of the flange joint. The hole shall be swabbed with soap solution during the test to maintain a soap film.

All welds, screwed joints and other connections shall be swabbed with a soap solution before and during the test period.

A preliminary leak test shall be made at 200 kPag. All joints shall be inspected, and any leaks shall be corrected before proceeding with the test.

The test shall be continued by slowly releasing additional air or gas into the piping system until the test pressure is obtained. The test pressure shall be 1.1 times the design pressure, in accordance with ASME B31.3-Process Piping. The system shall then be inspected for leaks a second time.

If leaks are found, the system shall be depressurised, the leaks corrected, and the pressure test repeated. The pressure shall be maintained for a minimum of one hour after all leaks are corrected.

Upon completion of the test, De-pressurization will take place within strict compliance of the approved pneumatic procedure.

19 FACTORY ACCEPTANCE TESTS

Where required by the Purchase Order, equipment shall undergo a FAT's to demonstrate the equipment is suitable for the intended purpose and functions correctly, and achieves the requirements of the relevant Functional Design Specification FDS.

The Supplier shall generate a specific FAT procedure for the equipment which shall be submitted to the Company for approval, such procedures shall enable equipment to be FAT'd in such a manner that the Supplier can demonstrate to the satisfaction of the Company that the requirements of this specification and PO Functional Specification have been met.

FAT procedures shall be submitted for review and approval by Company prior to testing and in the timeframe specified within the SDRL or as agreed with Company.

Supplier shall identify in their procedures the extent of FAT's to be carried out, which as a minimum shall typically include:

- Visual inspection,
- Assembly check,

- Dimensional Control,
- Hydrostatic and/or Hyperbaric proof pressure/leak testing, as applicable,
- Hydraulic fluid cleanliness check,
- Electrical testing,
- Software testing, as applicable,
- Function testing, and
- Interface check.

Supplier shall supply all test equipment and spares as required to fulfil these tests. A FAT shall be undertaken in accordance with Supplier's procedures as reviewed and approved by Company, which shall as a minimum conform to the requirements of the applicable code or standard.

Procedures shall have a staged sign off column for Supplier and Company to verify, completed FAT endorsed procedures shall form part of the MDR.

Company shall witness FAT as specified in the ITP. Suppliers shall notify Company fourteen (14) days prior to FAT commencing, where and when FAT's are to be carried out.

20 INSPECTION RELEASE

The release and delivery of product to Company shall not proceed until the required activities on the approved ITPs, including Regulator requirements, have been satisfactorily completed, unless otherwise approved by Company.

Inspection release shall occur prior to shipment (movement) and after Supplier has verified the following:

- All Work (or part thereof) has been completed,
- All ITP and other testing activities have been completed and accepted by the nominated representatives or parties,
- Associated verifying documents have been sighted, reviewed, and accepted,
- Associated verifying documents have been incorporated in the MDR,
- Any related Non-Conformance Reports and TQDs have been closed-out,
- Issuance of a Certificate of Conformance (COC),
- Delivery documentation, shipping papers and associated documentation is available and stored appropriately,
- Packing, protection, and preservation has/is being applied to approved standards,
- If applicable, documented outstanding work items / punch list that is accepted by Company,
- In the case of equipment requiring a Factory Acceptance Testing (FAT), in addition to the above requirements, Supplier shall prepare and maintain a detailed post-test "Punch-List" which shall require Company formal acceptance of prior to shipment of equipment, and
- Where deemed applicable by Company, Supplier shall utilise a Preventative Maintenance Inspection & Test Plan (PMITP) to ensure package level equipment, or rental tooling packages are ready and acceptable by Company for mobilisation. The PMITP shall require formal acceptance by Company and shall have the Punch List appended.

Company's inspector shall sign and issue an Inspection release document for all equipment and materials at time of release from Supplier's premises. Company inspector shall review Supplier's MDRs and IOMs prior to issuing its Inspection release document. The Inspection release document shall indicate the MDR and IOM status and all outstanding work items.

Supplier shall ensure any applicable Company Marine Warranty Surveillance (MWS) requirements have been completed prior to release.

21 MANUFACTURER'S DATA REPORT (MDR)

An MDR shall be prepared to show all aspects of the product's manufacture. The record shall be progressively compiled and kept up to date at all times. The record shall be available to Company for review at any time. Supplier shall ensure, via regular documented surveillance reports, that any sub-suppliers/Sub-contractors are compiling their respective MDR(s) progressively.

Suppliers shall submit a Table of Contents, within twenty-eight (28) days of PO/contract receipt in accordance with the document requirements of the Purchase Order and the sample MDR index provided in Appendix C, sections that are not applicable can be marked as N/A.

The MDR shall be written in English or shall include a complete certified English translation. Supplier shall be responsible to ensure all documents have been reviewed for completeness and legibility. Documents shall be original or certified copies. Where documents are not originals i.e., material or mill certificates etc, these shall be stamped and signed by authorized person to confirm that they are true and verified copies of the original. Amending documents that form part of MDR using correction fluid or scribing out deletions with markers or pens is not permitted. Company reserves the right to reject documentation that does not meet this standard (particular note should be paid to documents translated from non-English source content).

The MDR shall reflect the materials, Company Provided Items, manufacturing, assembly, installation, inspection, and test history associated with the works, and shall provide sufficient information to assure Company of the quality compliance with the relevant specifications and drawings.

If materials/components are partially delivered, a separate MDR shall be prepared for each partial delivery. For equipment, the MDR shall be compiled on a per tag or item-by-item basis.

The MDR shall be a fully readable and searchable PDF document, and all sections shall be bookmarked as per the agreed MDR Index.

All pages shall be numbered. Each section shall be page numbered e.g., Pages within Section A shall be numbered as A1 of (total number of pages for that section), e.g. A1 of 21, A2 of 21, A3 of 21 etc.

22 INSPECTION, MEASURING AND TESTING EQUIPMENT CALIBRATION

Supplier shall maintain a register of calibrated inspection and testing equipment; the register shall be progressively maintained and be made available for Company review on request.

All test equipment used for formal inspection, measuring and testing shall have been calibrated by a laboratory who are accredited to ISO/IEC 17025. Records of calibration shall accompany the equipment and calibration certificates shall be held on file.

Company may accept in-house calibrated equipment on a case-by-case basis.

23 PROHIBITED MATERIALS AND CHEMICALS

Company highlights the need for Supplier to ensure substances which are banned from entering Australia or present undue health risk to individuals are not included in their equipment. Some of these prohibited substances include, but are not limited to;

- Asbestos,
- Chlorinated solvents and thinners,
- Chromium plated bolts,
- Halon and other chlorinated fluorocarbons,
- Paint containing Lead or chromium,
- Coal tar epoxy paint,
- Coal tar urethane paint,
- Paint containing Isocyanate,
- Lead based thread compounds,
- Ozone depleting substances/ synthetic greenhouse gases as defined by the Montreal Protocol,
- Polychlorinated Biphenyls (PCBs),
- Silica-containing abrasive blast products, and
- Fire extinguishing agents containing Perfluorinated Chemicals (PFAS)/ Perfluoro octane sulfonate (PFOS).

Where Supplier identifies the use of one of these products within their works, or supply chain, then they shall advise Company and seek a way to avoid the products use by substitution or other means.

Supplier shall include, as part of their inspection surveillance report templates, a section that requires the Supplier's inspectors to review materials against the MSDS and materials certificates, during their surveillance visit and highlight any areas of concern. This shall include temporary items, such as gaskets.

Supplier shall arrange and conduct independent testing of high risk materials for the above referenced substances. The independent testing laboratory shall be certified to ISO/IEC 17025 specifically relevant for the scope of test they are performing. Supplier shall provide its proposed sampling plan based on high risk areas of the Works and provide to Company for concurrence.

At the completion of any testing, Supplier shall compile and provide all independent test reports to Company. Supplier shall make Company aware of any detected banned materials immediately upon its detection and shall take necessary steps to ensure the material is safely handled and disposed of.

24 REVISION NOTES

This specification is next scheduled for review: January 2026.

Revision 0

This specification was previously document [SO-91-QQ-20002 / 1515-770-QAC-0003].

Revision 0 reflects the migration of Santos engineering documentation from WA legacy document control to myPlant OP during 2022. No technical update changes have been made to this standard.

Revision 1

Revision 1 reflects updates to ambiguous wording, correction to NDT weld repair requirements, and addition of weld repair section.

25 [APPENDICES](#)

- [Appendix A](#) Company Inspection and Test Plan
- [Appendix B](#) Pre-Inspection Meeting Agenda
- [Appendix C](#) Typical MDR Index
- [Appendix D](#) Marking and Material Certificate Requirements

APPENDIX A COMPANY INSPECTION AND TEST PLAN

| SUPPLIER | | | | ITP NO. | | P.O. NO. | P.O. ITEM NO.: | LEGEND: | | | |
|-----------------------------------|------------------|------------------------------|--------------------------------|--|------------------------|------------------------|-------------------------------------|---|---------|-------------------|-------------------|
| INSPECTION AND TEST PLAN | | | | REV NO. | | | | W = WITNESS, R = REVIEW, H = HOLD, A = APPROVE, M = MONITOR | | | |
| SUPPLIER: | | | SUPPLIER CONTACT: | | SUPPLIER APPROVAL: | DESCRIPTION OF ITEM: | | EQUIPMENT NO: | | | |
| WORKS LOCATION: | | | | | | | | | | | |
| TASK No. & PROBABLE DATE | Task Description | LOCATION CODE (I OR S) | QUALITY CONTROL ACTIVITY | CONTROLLING PROCEDURE OR INSTRUCTION | ACCEPTANCE CRITERIA | VERIFYING DOCUMENTS | INSPECTION REQUIREMENTS (W/H/R/A/M) | | | | SUPPLIER |
| | | | | | | | SUB-SUPPLIER | SUPPLIER | Company | VERIFYING BODY | SIGNATURE (12) |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
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| | | | | | | | | | | | |

When completing an ITP on the pro forma provided in this package, the Supplier shall:

- COLUMN 1 - indicate the task number and probable date on which the QC activity shown in column 4 is to be carried out. Where the QC activity occurs over two or more weeks the probable date (or week number) shall be specified as weeks X to Y, e.g., weeks 23-31. Tasks shall be numbered chronologically taking into consideration design, procurement, production, fabrication, construction, packing, transportation, and installation/commissioning, as appropriate.
- COLUMN 2 AND 4 - the task and associated quality control activity, or activities, to be carried out shall be described. Supplier is responsible for determining ITP QC activities particular to the Work. However, the Company may insert any additional activities that may be considered necessary.
- COLUMN 3 - indicate, by the use of "I" or "S", whether the task or activity is to be carried out in- house (I) by the Supplier or alternatively utilising a sub-supplier (S).
- COLUMN 5 - give procedure title and reference, including document reference number and clause(s).

Appendix A Company Inspection and Test Plan

- COLUMN 6 - the acceptance criteria pertaining to each activity is to be stated, including specification reference number and clause(s).
- COLUMN 7 - the verifying documents are to be clearly identified by name and BS EN 10204 type e.g., “pressure retaining plate, type 3.1”.
- COLUMN 8 - the Supplier must place a ‘W’ (Witness), ‘H’ (Hold), ‘R’ (review), ‘A’ (approve), ‘M’ (Monitor) as applicable, for every Quality Control Activity, since such activities are required to be witnessed, reviewed, or monitored by the Supplier’s QC / Inspection organisation.
- COLUMN 9 - will be completed when ITPs are reviewed by Supplier and will indicate those activities to be subject to Witness (W), Hold (H), review (R), Approve (A) or Monitor (M) inspection by the Supplier.
- COLUMN 10 - will be completed when ITPs are reviewed by Company and will indicate those activities to be subject to Witness (W), Hold (H), review (R), Approve (A) or Monitor (M) inspection by the Company.
- COLUMN 11 - will be used to indicate any survey or verification activity required by the appointed Verifying Body. This section shall be completed prior to final approval by the Company.
- COLUMN 12 - shall be signed by the Supplier’s representative responsible for undertaking the task, to indicate that it has been satisfactorily completed in accordance with requirements.
- COLUMNS 8, 9, 10 & 11 – shall be signed off progressively by the respective parties to indicate acceptance of the activity.

APPENDIX B PRE-INSPECTION MEETING AGENDA

Typical PIM agenda;

- Introduction of organisations, key personnel, and responsibilities,
- HSE requirements applicable to plant, factory, site, test facility, office visitors,
- Scope of Supply overview,
- Execution schedule overview,
- Check contract documents have been received at correct revisions,
- Check to ensure the requirements of the Company Contract, including this specification, have been understood,
- Access protocol for Supplier and Company representatives,
- SDS review,
- Procedure qualifications and approvals status (welding, NDT, pressure testing, FAT, SIT etc.),
- Qualification status of proposed inspectors (welding, NDT, and coating),
- Structured tour of the manufacturing facility, presentation of all stages of manufacture and its relationship to the ITP,
- Thorough review of ITP status and agreement on 'Hold and Witness Points',
- Non-conformance control processes,
- Deviation management,
- MDR Index and structure, and
- Requirements for taking photos.

APPENDIX C TYPICAL MDR INDEX

Section A

The Inspection Release Certificate issued by Company or Supplier's inspector and endorsed by Supplier's quality representative shall be included.

Section B

Index of all associated technical queries and deviations agreed by Supplier.

Each individual technical query and deviation with documented evidence of approval shall be included.

Section C

Index of all associated Non-Conformance Reports (NCRs).

Each closed NCR associated with the Works, with all associated records.

Section D

Index of all associated Inspection and Test Plans (ITPs).

Final revision of each Inspection and test plan (ITP) approved by Company shall be included.

Section E

Certificate of compliance to the purchase order requirements for fabricated items shall be included. Fire Test Reports / Certificates, if applicable.

Section F

Index of Material Certificates and Material Test Reports, material traceability system. All Material Certificates, weld consumable test certificates and Material Test Reports with shall be included.

Section G

Welding Records shall include, but not limited to;

- Complete set of approved WPS/WPQR's,
- Final Approved Welder qualification list with re-validation log,
- Weld Maps,
- Daily Weld Records (DWR), inspection records, signed verified by Supplier's quality representative at time of Witness/Surveillance,
- Welding Consumable Batch Certificates,
- GTAW Orbital Automatic preproduction tests and drift test records, and
- Post Weld Heat Treatment records.

Section H

Non-Destructive Testing (NDT)

- Complete set of approved NDT procedures,
- Copies of all NDT operator qualifications/certifications,
- All Non-Destructive Testing Records (RT, UT, MT, PT, Hardness, PMI, Ferrite Check for weld etc.) with Maps shall be included, signed verified by Supplier's Quality Representative at time of Witness/Surveillance, and
- Digitised Radiograph films (these may be provided separately via electronic means).

Section I Repairs

- Any repairs and related heat treatment reports,
- Location of repairs shall be shown on the as-built drawings, and
- Results of additional NDT shall be reported.

Section J Heat Treatment

- Complete approved heat treatment procedures, and
- Heat treatment records and charts shall be included.

Section K

- Dimensional and Tolerance Records,
- Visual Inspection, including the checking of Flange face condition just before packing,
- Load test records for lifting points, and pre- and post- load test NDT records,
- Equipment Weight Certificate, and
- Balance Certificate.

Section L

- Approved Pressure test procedures (hydrostatic and pneumatic),
- Pressure Test Charts and Records,
- Hydrostatic Test Water Quality Certificate,
- Pneumatic test reports, and
- Any other leak test reports (Tell-tale Hole leak, Tube/ tube sheet leak, etc).

Section M

Production Test, Mechanical, Performance Test Records, including but not limited to;

- FAT/ SAT Records,
- Balance Test Records,
- Vibration Test Records,
- Functional/ Performance Test Records,
- Over speed Test Procedure and Records, and
- Noise Reports.

Section N

- Painting/coating system details,
- Paint batch material certificates,
- Batch (Sample) test reference panel results,
- Surface preparation records,
- The conditions of humidity during each layer application,
- Continuity testing of painting/coating,
- Painting thickness and visual inspection reports,
- Insulation system details,
- Surface preparation/condition report prior to insulation application, and
- Inspection records of each layer of insulation applied.

All of the above coating and insulation records shall be signed verified by Supplier's quality representative at time of Witness/Surveillance.

Section O

Electrical Certificates and Test Reports, including but not limited to;

- Bulk electrical material certificates,
- Completed Motor Data Sheets by Motor supplier,
- Hazardous Area Dossier and associated Certification,
- IP Rating Certificate,
- Inspection and Test Records for Hazardous Area Equipment,
- Electrical Type Test Records,
- Routine Test Certificates,
- Manufacturing Test Records,
- Final Test and Insulation Records, and
- Functional Test Records.

Section P

Instrument Certificates and Test Reports, including but not limited to;

- Bulk instrument material certificates,
- Hazardous Area Dossier and associated Certification,
- IP Rating Certificate,
- Inspection and Test Records for Hazardous Area Equipment,
- Instrument Type Test Records,
- Instrument Calibration Records,
- Manufacturing Test Records,
- Software Verification Certification, and
- Functional Test Records.

Section Q

Index of Instrument and Measuring Test Equipment used for any testing for the Works.

All Instrument and Measuring Test Equipment calibration records, calibrated by companies certified in accordance with ISO/IEC 17025 [Ref 12].

Section R

Colour photos of Nameplate shall be included.

Section S

Other all Verifying Records which are described in each ITP, that do not form part of the above sections, including but not limited to;

- Piping Test Package Folders containing;
 - Marked-up P&ID defining Test package Boundaries;
 - Marked-up P&ID details and notes;
 - Marked up isometrics defining the piping and components inside the test limits;
 - Bill of Material (on Isometric);
 - Line List which shows From Where to Where;
 - Final Closure form if manways are present;
 - Reinstatement of inline fittings (PSVs, Control Valves, instruments);

- Flange tightness checks.
- Rotating Equipment Folders
 - Equipment base plate levelling and alignment;
 - Equipment alignment;
 - Equipment to pipe alignment;
 - Coupling installation.
- Static Equipment Folders
 - Installation of internals;
 - Final Closure form
- Preservation and Maintenance Records at Worksite(s) and Site

Section T

Any applicable statutory or third-party approval certificates.

Any Applicable Codes and Standards Compliance / Type Approval Certificate.

Section U

Redline Mark-up Drawings associated to the scope.

APPENDIX D MARKING AND MATERIAL CERTIFICATE REQUIREMENTS

The following table describes the standard certification and marking requirements by material group. These requirements shall apply unless they are modified by a Material Requisition or Purchase Order.

| Material Group | Product | Marking Requirements | EN 10204 Certificate Type |
|----------------------|---|--|--|
| Electrical | Electronic or electrical instruments | Notes (1) or (2) or (4) | Note 9 |
| | Switch/control gear | Notes (4) or (7) | Note 9 |
| | Electrical Wires and Cables | Note (7) | Note 9 |
| | Cable glands | Note (1) | Note 9 |
| Fasteners | Austenitic Stainless Steel and Super Duplex Bolting | Note (1) on the end of the bolt Note (5) on bags of stud bolts | 3.1 |
| | Coated Alloy Steel Bolting | Note (1) on the end of the bolt Note (5) on bags of stud bolts | 3.1 (Materials) 2.1 (Coating) |
| | Structural bolting | Note (1) on the end of the bolt Note (5) on bags of stud bolts | 2.2 (Materials) 2.1 (Coating) |
| Hoses | Flexible hose assemblies | Note (5) & Note (11) | Note 8 |
| Instrumentation | Pressure and Temperature Transmitters | Notes (4) and / or (5) | 2.2 (Wetted materials) |
| Mechanical Equipment | Rotating Equipment | Notes (1) and (6) on any castings | Note 9 |
| | Pressure Vessels | Notes (4) and (6) on any castings and (1) where required | Note 9 |
| | Lifting Equipment | Note (1), (2), (4) or (5) | 3.1 (Rigging, lifting devices, lifted equipment) |

Appendix D Marking and Material Certificate Requirements

| Material Group | Product | Marking Requirements | EN 10204 Certificate Type |
|--|---------------------------------------|---|--|
| Other | Flare Tip | Notes (1), (2) or (3) | 3.1 (Flare tip, lifting lugs) 2.2 (All other materials) |
| Pipe, Pipe Fittings, Flanges, Spades, Spacers/Blinds and Strainers | Gaskets | Note (1) (Spiral Wound and Grooved), Note (2) (RTJ), Note (3) (All other gaskets) | 3.1 (RTJ) 2.1 (All other gaskets) |
| | Pipes, Flanges & Fittings | Note (8) & (12) | 3.1 |
| | Spring Support | Note (8) | 3.1 (Load bearing materials) 2.1 (All other materials) |
| | Hub Connectors | Note (1), (12) and/or (13) | 3.1 |
| Structural | Structural steel members | Note (1) | 3.1 |
| | Fabricated Steel Structures | Note (9) | Note 9 |
| Weld Consumables | Welding Consumable batch certificates | N/A | 2.2 |
| Valves | Relief and Safety Valves | "Note (4) and/or (5) (Valve Body) Note (1) or (2) (Outlet Flanges)" | 3.1 (Pressure Retaining Materials) 2.1 (Trim Materials) |
| | Ball Valves | Notes (4) and / or (5) | 3.1 (Pressure Retaining Materials) 2.1 (Trim Materials) |
| | Butterfly Valves | Notes (4) and / or (5) | 3.1 (Pressure Retaining Materials) 2.1 (Trim Materials) |
| | Gate Valves | Notes (4) and / or (5) | 3.1 (Pressure Retaining Materials) 2.1 (Trim Materials) |
| | Globe Valves | Notes (4) and / or (5) | 3.1 (Pressure Retaining Materials) 2.1 (Trim Materials) |

Appendix D Marking and Material Certificate Requirements

| Material Group | Product | Marking Requirements | EN 10204 Certificate Type |
|----------------|--------------------------------|------------------------|--|
| | Check Valves | Notes (4) and / or (5) | 3.1 (Pressure Retaining Materials) 2.1 (Trim Materials) |
| | Modular Valves and Monoflanges | Notes (4) and / or (5) | 3.1 (Pressure Retaining Materials) 2.1 (Trim Materials) |

NOTES

- (1) Hard stamping, using round nose low stress stamp.
- (2) Vibro-etching.
- (3) Waterproof paint or ink stencil. Stencilled characters shall be not less than 5mm in height.
- (4) Stainless steel nameplates, affixed with riveting or screws, all to be 316 Stainless Steel or better. Non-molybdenum stainless steel is not acceptable.
- (5) Stamped metal tag securely affixed with stainless steel wire or ferrules, all to be 316 Stainless Steel or better. Non-molybdenum stainless steel is not acceptable.
- (6) Cast in characters.
- (7) Die moulded characters for PVC or similar products.
- (8) Refer to Technical Delivery Terms
- (9) Refer to Purchase Order
- (10) Preferred flow direction, if applicable shall be clearly and permanently marked
- (11) All FHAs longer than two meters shall be fitted with two tags, one at each end.
- (12) "N" shall be marked as a suffix to the material ASTM designation or UNS designation, to identify the component as suitable for Sour Service.
- (13) "LT" shall be marked suffix to the material ASTM designation or UNS designation, when identified as for Low Temperature Service.

Appendix D Marking and Material Certificate Requirements

| Certificate Type | Certification Description |
|---------------------------------------|---|
| Certificate according to EN 10204-2.1 | Letter of Conformity (LOC) by Manufacturer confirming compliance with order, without inclusion of test results. |
| Certificate according to EN 10204-2.2 | Document issued by the manufacturer in which they declare that the products supplied are in compliance with the order and is supported by supplied test results based on a non-specific inspection. Example: - A LOC accompanied by a Batch Type Test Certificate or other in-house tests |
| Certificate according to EN 10204-3.1 | Document issued by the manufacturer in which they declare that the products supplied are in compliance with the requirements of the order and is supported by test results. a) The test results are defined by the product specification/code/standard, official; regulation and or corresponding rule or order, b) The document is validated by the manufacturer's authorised inspection representative, independent of the manufacturing department (internal or external). It is permissible for the manufacturer to transfer test results from other inspections on primary incoming products, provided that the manufacturer operates using a formalised traceability and inspection procedure. Example: Material chemical & mechanical properties. |
| Certificate according to EN 10204-3.2 | Document prepared by both the; 1) manufacturer's authorised inspection representative, independent of the manufacturing department, and 2) either the purchasers authorised inspection representative, or the inspector designated by the official regulation and in which they declare that the product supplied is in compliance with the order and are supported by test results. Example: - A certificate issued by Classification Society such as Lloyds Register, ABS, DNV, BV or purchasers inspection representative. |