Quality Requirement

Raw Material General Requirements

RIG/PLANT		
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CHANGE DESCRIPTION

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2	Revision to align metadata in the system No changes to the content
1	Changed Section 1.1 - Updated Mill test certificate requirements Changed Section 2.2 - Updated charpy requirements to allign with DNV-OS-E101 Added section 4.3 Visual Inspection
0	Initial release

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1 RAW MATERIALS

This chapter covers materials for construction purposes.

Note that all material dimensions and sizes on the material lists in our drawings are net, post-production sizes.

Accordingly, all dimensions are given without deductions for beveling or allowances for machining unless noted otherwise. The Supplier must therefore take the above into consideration when ordering materials.

1.1 Mill Test Certificates/Reports (MTRS)

Mill Test Certificates/Reports (MTRs) shall be supplied when specified on the PO document package and/or engineering documentation.

Unless otherwise stated in the purchasing documentation, MTRs shall be required for all steel having a specified yield strength greater than the following:

- Structural shapes or plate, 248 MPa (36 ksi)
- Tubing, 317 MPa (46 ksi)
- Solid round bars, 414 MPa (60 ksi)

When Mill Test Certificates/Reports (MTRs) are required, it shall be reviewed by the supplier, conducted by a competent person to ensure material received conforms to NOV drawings, material specifications, and the Supplier's purchase order.

All Mill Test Certificates/Reports shall be legible and, has been reviewed to a known standard and all information is complete and in compliance with the requirements.

1.2 Mill Test Certificates/Reports Information

MTRs shall meet all material specifications and/or drawing requirements and shall contain the following information as minimum and as applicable:

- Manufacturer's name and address
- Purchase order number/work order number
- Material type and grade
- Chemical properties
- Mechanical properties
- Quantity
- Dimensions

1.3 Marking and Identification of raw materials

The Supplier shall establish a proper identification and traceability system for all materials. This system is to ensure that only controlled materials of correct grade are installed, and to ensure historical traceability according to drawings and material lists.

2 MATERIAL TESTING AND CERTIFICATION

2.1 Material Certification

All materials in category "essential" and "primary", and equivalent classes (pending on design origin, see table below), shall be supplied with certificates according to EN-10204 type 3.1 unless specified differently in the PO documentation packaged or as agreed, in written, between the supplier and the buyer.

Type 3.2 is applicable for special load bearing components according to classification regulations or NOV requirements.

Type 2.2 certificates issued by the manufacturer (not agents) may be accepted for materials of "secondary" steel purposes as defined for ABS and DNV, in the table below, (US/Canada/Asia equivalent is miscellaneous), i.e. steels for non-load carrying purposes like ladders, walkways, wire guides, brackets for junction boxes, light fixtures, brackets for hydraulic lines, components, signs etc.

Certificates for secondary steels shall be collected and kept in the Supplier`s manufacturing record files, for a period minimum 7 years, for NOV's historical traceability and shall not be a part of the MRB.

NOV-Europe	NOV-US/Canada/Asia	DNV	ABS
Essential	Primary	Essential	Primary
Primary	Secondary	Primary	Non-Primary
Secondary	Miscellaneous	Secondary	Secondary/Miscellaneous

2.2 Material Testing

Steel shall be tested by the mill according to the applicable standards for the specified steel type requirements. Any material that is not tested by the mill will not be accepted by NOV.

For axles and bolts special attention shall be paid to specific Charpy requirements on actual drawings/class society requirements.

For materials with specified yield strength equal to and above 60 ksi (420 MPa) the Charpy V requirement is 42J unless more stringent requirements are specified in the engineering documentation. The minimum Joule requirement shall be 10% of yield for materials with specified yield strength up to 60 ksi (420 MPa), unless otherwise specified in the drawings or engineering documentation.

Specified minimum yield strength (MPa)	*Charpy V-notch energy (J)*
Yield strength ≤ 270	27
270 < Yield strength < 420	10% of yield strength
Yield strength ≥ 420	42

Charpy V testing shall generally be done at - 4° F (-20°C). If different Charpy requirements are stated in PO, drawings or referred class rules/ standards the most stringent requirement shall apply.

Note: Special attention to product specifications related to Charpy requirements in relation to API specs shall be taken by the supplier as requirements vary significantly and be more stringent than above specified.

3 MATERIAL STANDARDS AND MATERIALS SUBSTITUTION

3.1 Material Substitution process

Supplier may propose substitute materials in writing to NOV for approval.
No material substitutions shall take place unless a written approval from NOV has been formalized and agreed between both parties.
Material substitution shall only be considered as a last resort due to lack of availability or impact on delivery.

3.2 Substitute Materials Records

Any substitution of an alternative material as called out in the engineering drawing or instructions shall be documented and traceable to the specific unit by serial/lot number or similar specific identification.

Substitute material records, including the approved substitution request, shall be part of the quality records due at the time of delivery and final documentation as applicable.

4 MATERIALS RECEIVING, INSPECTION, STORAGE AND PRESERVATION

4.1 Materials Receiving and Preservation

The Supplier shall perform receive inspection of materials and components to ensure that purchased product meet requirements. Receive inspection to ensure correct delivery shall be performed.

4.2 Materials Storage and Preservation

The Supplier shall ensure that materials are adequately protected during procurement, storage and fabrication. Storage shall be controlled to avoid material deterioration. Some formation of rust during fabrication may be accepted, but the rust grade shall be within the limits of ISO 8501-1 grade B or equivalent standard.

4.3 Visual Inspection

Materials shall be subject to close visual inspection at receiving and prior to being issued from warehouse to production. The visual inspection shall ensure that the materials meets all specifications including that traceability marking is maintained and that material is free of defects.