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GP 10-50

Engineered Equipment

Group Practice

**BP GROUP
ENGINEERING TECHNICAL PRACTICES**

Introduction

The introduction to this ETP mirrors section 25 of the revised DWOP.

All Engineered Equipment shall conform to Engineering Technical Practice GP 10-50 – Engineered Equipment

1. This section covers only the permanently installed drilling and completion equipment listed in Table 1.
2. Critical engineered equipment shall be identified by means of a criticality assessment which accounts for the combined risk of HSSE, life-of-well integrity and business impact. Equipment shall be designated as critical when a Well Category of 2 or greater in Table 1 exists, at a minimum.
 - a. Critical equipment shall require the following:
 - i. Equipment Statement of Requirements (SOR)
 - ii. Designed in accordance with the applicable Industry specification. When an Industry specification does not exist, then equipment should be designed in accordance with a supplier's design specification that has been reviewed and accepted by BP.
 - iii. Qualified in accordance with the applicable Industry specification. When an Industry specification does not exist, then equipment should be qualified in accordance with a supplier's qualification procedure that has been reviewed and accepted by BP.
 - iv. BP may impose additional qualification test that exceed Industry specifications.
 - v. Design Review
 - vi. Manufactured, inspected and tested in accordance with the applicable Industry standard and to a BP Global QCP or the Integrity Assurance Specification (IAS), Examination Level 2.
 - vii. Factory Acceptance Test (FAT)
 - viii. Shop assembly and test quality plan for the inspection, make-up, and test of critical equipment assemblies.
 - ix. In addition, some critical equipment should require the following:
 1. Stack-up Tests
 2. Systems Integration Test (SIT)
 - b. Non-critical equipment shall be fit-for-purpose for the well service conditions from initial well construction, during the life-of-well and thru abandonment.
3. Engineered equipment, as identified in the following table, shall be designed, qualified, manufactured, inspected and tested in accordance with ETP GP 10-50 and the requirements shown in table 4 embedded in the ETP document below:
4. Only BP approved connections shall be used for field-end connections of engineered equipment.
5. Critical equipment that is integral to the production tubing string shall be analyzed and evaluated as part of the tubing design as per Section 13.
6. All engineered equipment shall be visually inspected, drift tested (if applicable) and function tested (if applicable) as close to the point of use as possible for handling damage to the equipment and threaded connections that could present problems during installation and/or over the life of the well.



7. All engineered equipment shall be accompanied with a supplier's installation procedure. BP well site procedures shall incorporate these procedures as applicable.
8. Operations during installation and well life shall not exceed the loads under which exposed equipment have been designed. A design evaluation shall be completed, should such an occurrence be contemplated.

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Foreword

This is the first issue of Engineering Technical Practice (GP) BP GP 10-50. This Group Practice (GP) is based on parts of the *BP Drilling and Well Operations Policy* (BPA-D-001), and, for the subject matter covered herein, supersedes that document.

This GP provides the minimum requirements for the specification, design, qualification and procurement of permanently installed Drilling and Completion (D&C) engineered equipment to contain the pressure envelope and ensure integrity of the well during its construction, life cycle and abandonment. Additional requirements consider design review, shop assembly and installation. This GP also details reference standards and requirements that constitute the minimum level of acceptability for BP's permanently installed D&C engineered equipment.

The organizing principles of this GP are as follows:

This is a new GP for D&C. The initial version will cover only a limited set of permanently installed D&C equipment; thus, will not cover rental equipment, intervention equipment, commodity equipment or re-furbished equipment.

The principle directive of the GP is to address Major Accident Risk (MAR); this GP will extend beyond the traditional MAR identified equipment (surface tree, surface wellhead and SCSSV) to cover other critical engineered equipment to ensure well integrity.

The initial focus of this GP will be on the specification, design, qualification, procurement, and installation.

This GP is based largely on BP's Equipment Integrity Assurance (EIA) initiative which includes the Equipment Integrity Assurance Guidelines (EIAG); Equipment Statement of Requirements (ESOR); Integrity Assurance Specifications (IAS) and Global Quality Control Plans (Global QCP). Whenever possible, key EIA elements have been codified as requirements.

This GP will be aligned with the GP for Casing & Tubing Design (GP 10-00); as such, the structure and wording are intended to be identical if applicable. The view was the Wells Discipline Engineers responsible for well design would likely be responsible for casing, tubing and engineered equipment. Thus, these two GPs will be frequently used by the same user and should be consistent.

This GP is not a well/completion design manual or equipment primer; instead, it is succinct policy statements and intentionally legalistic.

This GP does not address accountabilities, training or competency; these will be covered by other Integrity Management (IM) elements. For this GP, competency is assumed. For this GP, accountabilities will not be assigned.

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1. Scope

This GP provides the minimum requirements for the specification, design, qualification and procurement of permanently installed Drilling and Completion (D&C) engineered equipment to contain the pressure envelope and ensure integrity of the well during its construction, life cycle and abandonment. The equipment types covered by this GP are listed in Table 1. Additional requirements consider design review, shop assembly and installation. This GP also details reference standards and requirements that constitute the minimum level of acceptability for BP's permanently installed D&C engineered equipment.

Other D&C engineered equipment (Table 2) such as rental equipment, intervention equipment, commodity equipment or re-furbished equipment is not covered in this document.

2. Normative references

The following normative documents contain requirements that, through reference in this text, constitute requirements of this technical practice. Requirements in these documents not referenced are not requirements of this technical practice.

For example, Clause 5.3 requires all appropriate personnel to be knowledgeable of the elements of this GP related to their work activities. This is not meant to imply, per the statement above, that personnel should be knowledgeable of unreferenced material in the normative references listed in this Clause.

For undated references, the latest edition of the normative document referred to applies. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this technical practice are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below.

BP

BPA-D-003	<i>BP Tubular Design Manual</i>
BP-DC-EIA-DRP-01	<i>Design Review Process - Drilling, Completion and Subsea Equipment</i>
BP-EPT-IAS-01	<i>Integrity Assurance Specification (IAS) for the Procurement of Critical Equipment for Drilling & Completion (excluding Tubular Products)</i>
EIAG	<i>Equipment Integrity Assurance Guidelines - A Recommended Practice for Assuring the Technical Integrity of Equipment used by BP Drilling and Completion Organization</i>
GIS 02-203	<i>Specification for OCTG Crossover Connectors</i>
GIS 02-207	<i>Guidance Document for the Handling, Transportation and Storage of Casing & Tubing (OCTG)</i>
GN 06-004	<i>Selection and Treatment of Acids, Scale Dissolvers and Clear Brines to Avoid Corrosion Failure</i>
GN 36-001	<i>Guidance for the Supply of Alloy 718 for use in Oil and Gas Production and Treatment Systems</i>
GN 36-003	<i>Non-metallic Materials Selection</i>
GN 36-004	<i>Best Practice for Selection of Materials for Downhole Equipment</i>
GN 06-001	<i>Erosion Guidelines</i>
GP 06-14	<i>Group Practice for Erosion Control</i>
GP 06-20	<i>Group Practice for Materials for Sour Service</i>
GP 10-00	<i>Group Practice for Casing and Tubing Design</i>



Industry Standards

API Specification 6A	
/ ISO 10423	<i>Specification for Wellhead and Christmas Tree Equipment</i>
API Specification 14A	
/ ISO 10432	<i>Specification for Subsurface Safety Valve Equipment</i>
API Specification 14L	
/ ISO 16070	<i>Specification for Lock Mandrels and Landing Nipples</i>
API Specification 11D1	
/ ISO 14310	<i>Petroleum and Natural Gas Industries - Downhole Equipment - Packers and Bridge Plugs</i>
ISO 9001	<i>Quality Management Systems - Requirements</i>
NACE MR0175	
/ ISO 15156	<i>Petroleum and natural gas industries — Materials for use in H₂S-containing environments in oil and gas production API Q1</i>
/ ISO TS 29001	<i>Petroleum , Petroleum and Natural Gas Industries - Sector Specific Quality Management Systems - Requirements for Product and Service Supply Organizations</i>
ISO 17824	<i>Petroleum and natural gas industries - Downhole Equipment - Sand Control Screens</i>
ISO 28781	<i>Petroleum and natural gas industries - Downhole Equipment - Subsurface Barrier Valves and related equipment</i>

A number of the references listed above can be located at the technical practices portal, http://technical_practices.bpweb.bp.com/.

Useful information on equipment integrity assurance can be found at the Global EIA website, <http://eia.bpweb.bp.com/>.

Useful information on tubular design can be found at the Tubular Technology website, <http://octgdesign.bpweb.bp.com/>.

The final section of this GP also contains a Bibliography. Documents listed in the Bibliography appear for information only as an aid to the interested reader.

3. Terms and definitions

For the purposes of this GP, the following terms and definitions apply:

barrier

envelope of one or several dependent barrier elements preventing fluids or gases from flowing unintentionally from the formation, into another formation or to surface (see Annex A).

casing

one of several pressure and load bearing tubulars used to construct a well

basis of design (BOD)

A document that states all the parameters and requirements that may affect the engineering of equipment. An example parameter: the trajectory of the well. An example requirement: the need for equipment to have a minimum collapse rating.

