

## DEP SPECIFICATION

# SPARE PARTS

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## DESIGN AND ENGINEERING PRACTICE



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## 1. INTRODUCTION

### 1.1 SCOPE

This DEP specifies requirements and gives recommendations for the identification, selection, purchase and setting of stock levels for spare parts in new projects, modifications and single equipment orders. This DEP defines the responsibilities of the Principal, Contractor and the Manufacturer/Suppliers.

This DEP Specification gives detailed guidance on the process to be followed for the identification of spare parts within the project, including instructions on how to use the E-SPIR tool to collect the spare parts information, review the recommended spares and ensure timely availability.

This DEP defines the following categories for spare parts, and addresses requirements for each category:

- Capital Insurance Spares
- Commissioning Spares
- Initial Operating Spares
- Operating Spares
- Other Spares

This is a revision of the DEP of the same number dated February 2014; see (1.5) regarding the changes.

### 1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by Shell GSI, the distribution of this DEP is confined to Shell companies and, where necessary, to Contractors and Manufacturers/Suppliers nominated by them. Any authorised access to DEPs does not for that reason constitute an authorisation to any documents, data or information to which the DEPs may refer.

This DEP is intended for use in facilities related to oil and gas production, gas handling, oil refining, chemical processing, gasification, distribution and supply/marketing. This DEP may also be applied in other similar facilities.

When DEPs are applied, a Management of Change (MOC) process shall be implemented; this is of particular importance when existing facilities are to be modified.

If national and/or local regulations exist in which some of the requirements could be more stringent than in this DEP, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable with regards to the safety, environmental, economic and legal aspects. In all cases, the Contractor shall inform the Principal of any deviation from the requirements of this DEP which is considered to be necessary in order to comply with national and/or local regulations. The Principal may then negotiate with the Authorities concerned, the objective being to obtain agreement to follow this DEP as closely as possible.

### 1.3 DEFINITIONS

#### 1.3.1 General definitions

The **Contractor** is the party that carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project or operation of a facility. The Principal may undertake all or part of the duties of the Contractor.

The **Manufacturer/Supplier** is the party that manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party that initiates the project and ultimately pays for it. The Principal may also include an agent or consultant authorised to act for, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

The word **may** indicates a permitted option.

### 1.3.2 Specific definitions

| Term                            | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BoM</b>                      | Bill of Materials – a complete, formally structured list of components representing the spare parts listings for a piece of equipment. A subset of the BoM can be held as stock during the operating phase.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Capital Insurance Spares</b> | <p>Capital Insurance Spares are held to mitigate against circumstances that are not expected to arise routinely or frequently over the life of an item of equipment (and normally are not related to a dominant failure mode of the equipment), but which would have serious consequences (e.g., significant production losses) if those circumstances would occur.</p> <p>Capital Insurance Spares ideally would not be called upon for use in normal operational circumstances, they are an ‘insurance policy’, and therefore justification for their purchase is one of risk reduction. Capital Insurance Spares are generally characterised by having:</p> <ul style="list-style-type: none"><li>• High operational impact if not available</li><li>• Long replacement lead-time</li><li>• High purchase cost</li><li>• Low likelihood of usage</li><li>• Unpredictable demand</li></ul> <p>Capital Insurance Spares can be components or complete units, such as complete pumps, large valves, motors, transformers, turbo-machinery cartridges, rotors, and heat exchanger tube bundles.</p> <p>Capital Insurance spares are also known as insurance spares or capital spares.</p> |

| Term                        | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Commissioning spares</b> | <p>Commissioning spares are those required to enable uninterrupted installation, commissioning and start-up of the equipment.</p> <p>Commissioning spares requirements are driven by factors such as:</p> <ul style="list-style-type: none"><li>• Equipment standing idle for long periods could deteriorate.</li><li>• Testing and functional checking, with frequent opening of equipment for inspection.</li><li>• Abnormal operating conditions during testing and initial start-up could lead to increased use and premature wear or failure.</li><li>• Damage can occur during transport to site.</li><li>• Exposure to weather, dirty environment (e.g., if construction is not completed).</li><li>• Cleaning and de-preservation activities can damage equipment.</li><li>• Unknown equipment for which there is little or no operating experience.</li></ul> <p>Commissioning spares typically consist of start-up elements (e.g., special mesh filters), filter elements, seals, joints, electrical and instrumentation components, calibration equipment, and special tools.</p> <p>Commissioning spares also include spare parts for general use such as pipe, fittings, bolts, gaskets, electrical fuses, bulbs, cable, instrument tubing/fittings, lubricants, oils, chemicals, preservation fluids, recording paper, and chemical drying agents. They are generally specified on a contingency basis, dictated by experience on previous projects.</p> |
| <b>Consumable Spares</b>    | <p>Consumable spares are expendable items that can be regularly required or replaced, are not product-specific and are low cost.</p> <p>The Inventory Analyst is usually responsible for the stock replenishment of Consumable Spares, taking into account the level of past consumption, estimated future consumption and planned future operations as advised by the departments concerned. Generally the rate of consumption determines whether it is called a consumable or not.</p> <p>Typical examples include standard small bore valves, cable, jointing kits, glands, ladder rack, junction boxes, components, transmitters, pressure gauges, tubing, isolate/vent blocks, manifolds, compression fittings, bulbs, light fittings, and piping components such as pipes, flanges, fittings, bolts, nuts, gaskets.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>EFA</b>                  | <p>Enterprise Framework Agreement – an agreement between the Principal and a Manufacturer/Supplier, outlining a set of legal and commercial terms which the contracting entities can then use to call off goods or services.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Equipment</b>            | <p>A physical object designed to perform a specific function.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>E-SPIR</b>               | <p>Electronic – Spare Parts and Interchangeability Record. An application to support the Spare Parts identification process and workflow. For details, see <a href="http://www.e-spir.com">www.e-spir.com</a>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| <b>Term</b>                     | <b>Definition</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FA</b>                       | Framework Agreement – an agreement similar to an Enterprise Framework Agreement but covering commodities that are specific in nature to one business (e.g., Oil Country Tubular Goods).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Goods</b>                    | Materials or equipment, and any part or component thereof incorporated or to be incorporated therein.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Initial operating spares</b> | <p>Initial operating spares as a subset of operating spare parts are required to safeguard the operation of equipment during the first two years of operation.</p> <p>The need for initial operating spares is driven by specific factors which are particular to initial operations. Examples of these are:</p> <ul style="list-style-type: none"><li>• Increased potential for trips and subsequent starts may lead to wear and tear.</li><li>• Unknown/untested equipment.</li><li>• Increased load on equipment (e.g., high throughput).</li><li>• Unexpected process conditions (e.g., sand production).</li></ul> <p>Procurement of Initial operating spares is normally covered under the operating budget of the facility.</p> <p>See also definition of Operating Spares</p> |
| <b>Insurance Spares</b>         | See Capital Insurance Spares                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Kits (Operating Spares)</b>  | A class of operating spare that combines a number of spares and consumables, typically as used for a defined repair or overhaul, into a single stock assembly. When an equipment overhaul is planned, the complete kit is issued to the maintenance engineer who, after using some parts, returns the kit via the Supplies Department to the Manufacturer/Supplier.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>MESC</b>                     | Material and Equipment Standards and Codes. A materials and products catalogue designed to describe commodities (primarily piping, fittings and flanges) in a standardised fashion to allow the efficient specification and procurement of these items.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Movables</b>                 | Support equipment that is mobile. Typically includes vehicles, breathing apparatus sets, portable units and pumps, test equipment, special tool kits, cradles and frames, lifting equipment, mobile hoists, and ladders                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |