



ASSET BREAKDOWN FOR ONSHORE FACILITIES

DEP 01.00.09.10-Gen.

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DESIGN AND ENGINEERING PRACTICE



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PREFACE

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They are based on the experience acquired during their involvement with the design, construction, operation and maintenance of processing units and facilities, and they are supplemented with the experience of Group Operating companies. Where appropriate they are based on, or reference is made to, national and international standards and codes of practice.

The objective is to set the recommended standard for good design and engineering practice applied by Group companies operating an oil refinery, gas handling installation, chemical plant, oil and gas production facility, or any other such facility, and thereby to achieve maximum technical and economic benefit from standardization.

The information set forth in these publications is provided to users for their consideration and decision to implement. This is of particular importance where DEPs may not cover every requirement or diversity of condition at each locality. The system of DEPs is expected to be sufficiently flexible to allow individual operating companies to adapt the information set forth in DEPs to their own environment and requirements.

When Contractors or Manufacturers/Suppliers use DEPs they shall be solely responsible for the quality of work and the attainment of the required design and engineering standards. In particular, for those requirements not specifically covered, the Principal will expect them to follow those design and engineering practices which will achieve the same level of integrity as reflected in the DEPs. If in doubt, the Contractor or Manufacturer/Supplier shall, without detracting from his own responsibility, consult the Principal or its technical advisor.

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- 1) Operating companies having a Service Agreement with SIOP, SIEP, SIC or other Service Company. The use of DEPs by these Operating companies is subject in all respects to the terms and conditions of the relevant Service Agreement.
- 2) Other parties who are authorized to use DEPs subject to appropriate contractual arrangements.
- 3) Contractors/subcontractors and Manufacturers/Suppliers under a contract with users referred to under 1) or 2) which requires that tenders for projects, materials supplied or - generally - work performed on behalf of the said users comply with the relevant standards.

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All administrative queries should be directed to the DEP Administrator in SIOP.

NOTE: In addition to DEP publications there are Standard Specifications and Draft DEPs for Development (DDD). DDDs generally introduce new procedures or techniques that will probably need updating as further experience develops during their use. The above requirements for distribution and use of DEPs are also applicable to Standard Specifications and DDDs. Standard Specifications and DDDs will gradually be replaced by DEPs.

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1. INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for the compilation of the asset register of a company, needed for accounting, fiscal and other requirements. Local circumstances and insurance requirements can vary from country to country and may necessitate greater detail.

This DEP is a revision of the DEP of the same number dated April 1981.

1.2 DISTRIBUTION, APPLICABILITY AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by SIOP and SIEP, the distribution of this DEP is confined to companies forming part of the Royal Dutch/Shell Group or managed by a Group company, and to Contractors nominated by them (i.e. the distribution code is "C", as defined in DEP 00.00.05.05-Gen.).

This DEP is intended for use in oil refineries, chemical plants, gas plants, onshore exploration and production facilities and, where applicable, supply/marketing installations.

If national and/or local regulations exist in which some of the requirements may 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 as regards 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 with the object of obtaining agreement to follow this DEP as closely as possible.

1.3 DEFINITIONS

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

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

The **Principal** is the party which initiates the project and ultimately pays for its design and construction. The Principal will generally specify the technical requirements. 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.

1.4 CROSS-REFERENCES

Where cross-references to other parts of this DEP are made, the referenced section number is shown in brackets. Other documents referenced by this DEP are listed in (6).

2. GENERAL

An asset register shall exist for all manufacturing sites and it shall state the installed cost of individual physical assets.

The asset register shall include a description and the associated costs of all equipment, materials, services and other activities required to realise the assets.

Additions and amendments to the asset register shall be made after the completion of any work affecting the capital value of the assets of a site.

In order to apply this DEP, it is important at the initiation of any work that the asset breakdown requirements are discussed and understood by the parties involved. In projects where contractors are engaged it shall be necessary to formally agree in the contract documents that the information necessary to amend the asset register will be made available.

The physical assets which shall be included in the asset register are described in (3). The costs which shall be included for individual assets are detailed in (4). The physical assets which shall be included in the asset register are listed in the asset specification schedule (5).

3. PHYSICAL ASSETS

3.1 GENERAL

Assets shall be divided into the following main groups:

- Land
- Process units
- Storage, handling and dispatch facilities
- Auxiliary facilities
- General purpose facilities

Each main group (except 'Land') shall be divided into individual units or facilities, i.e. assets. An individual asset shall be defined up to its geographical (battery) limits. The location of each asset and its geographical (battery) limits shall be clearly indicated on a site plot plan.

Within these (battery) limits each unit/facility shall include all equipment and materials. The term "materials" shall include all piling, foundations, drainage systems, paving and other civil engineering work, all steel structures, all piping including interconnecting process and utility lines, electrical equipment and cabling, instrumentation etc.

Ancillary equipment, machinery, offices and other buildings forming an integral part of a particular asset should be considered to form part of that asset.

Equipment etc., serving more than one unit or facility shall be treated separately (3.6).

3.2 LAND

The total land area which the manufacturing site occupies shall be included as an asset in the asset register and shall indicate the title under which the site is occupied (e.g. under ownership or long term lease).

3.3 PROCESS UNITS

Each process unit shall be individually specified up to its battery limits.

3.4 STORAGE, HANDLING AND DISPATCH FACILITIES

It is acceptable practice to group storage tanks in the asset register. Since a group of tanks can be erected at several locations, the geographical (battery) limits of such a group will consist of more than one piece of land, e.g. several tank pits.

All bund walls, tank walls, tank foundations and paving as well as all lines and drainage up to the battery limit(s) shall be included.

The main feedstock and product distribution systems, e.g. blenders, shall be considered as separate assets under this group.

3.5 AUXILIARY FACILITIES

Each utility unit shall be individually specified up to its battery limit.

The main utility distribution systems, e.g. for electricity and steam, shall be considered separately. For the purpose of defining their battery limits it is recommended to assume they lie at the battery limits of, for instance, the boiler house and the battery limits of the units or facilities they serve. These assets shall include all interconnecting lines, steel structures (pipe-rack etc.), cables, instrumentation etc. within these limits.

3.6 GENERAL FACILITIES

General facilities include those units/facilities which serve the other assets, e.g.

- flushing oil and seal oil systems, firefighting systems;
- effluent treatment;
- stacks and flares;
- common control rooms;
- non-process buildings, fencing etc.;
- management information systems;
- etc.

3.7 COMMUNICATION SYSTEMS

Telephone, radio and television systems are each separate assets, though for these systems the normal geographical (battery) limits do not apply.

4. COST DATA

The cost of assets to be included in the asset register shall consist of the total cost to the Principal for the following cost elements:

- design and engineering
- equipment
- bulk materials
- erection, including finishing
- project / construction management
- owner's costs.

With regard to these cost components the following should be taken into account.

4.1 DESIGN AND ENGINEERING

All costs incurred in the design and engineering (D&E) of the assets shall be accounted for. These will include the cost of basic process designs and associated license fees, where applicable.

It may occur, e.g. in the case of lumpsum contracting, that a single figure only for design and engineering services is available. In such circumstances the D&E costs should be allocated to the individual assets, or equipment pieces if preferred, on a reasonable and transparent basis.

4.2 EQUIPMENT

Equipment is defined as all tagged items of equipment per asset, i.e. unit or facility.

The cost of equipment including capital spares shall be the "on site" cost, i.e. shall also include freight, insurance, duties and all other charges incurred in delivering the equipment to the site. Duties and taxes should be identified separately. Costs shall be expressed in the currencies paid as well as the local currency equivalent valid on the recorded date of procurement.

4.3 BULK MATERIALS

The recorded costs of bulk materials shall be the "delivered to site" costs. When prefabrication has taken place the associated costs shall also be included.

Bulk materials shall include all mechanical, civil, electrical and instrumentation materials required in the construction of the assets.

As with D&E, these costs may have to be divided over the equipment pieces using a reasonable and transparent basis.

4.4 ERECTION

The costs of erection of all equipment and bulk materials, including all subcontractor's costs, e.g. first line supervision, construction equipment, temporary facilities etc. shall be included in the asset register.

The finishing costs of painting, fireproofing, insulation and tracing shall also be accounted for.

Again, as with D&E and bulk materials, a 'reasonable and transparent basis' may be required to distribute these costs over the assets, or equipment pieces where preferred.

4.5 PROJECT / CONSTRUCTION MANAGEMENT

Where a managing contractor is employed for engineering, procurement and/or construction management services his costs shall be registered either separately or distributed as with D&E over the assets, or equipment pieces where preferred.

It shall be noted that contractor's specification of costs includes his profit element and compensation paid for contract changes agreed after awarding of contract, i.e. the contractor shall specify the total cost per asset of the project to the Principal, in costs per asset.

4.6 OWNER'S COSTS

Owners costs, such as own project task forces, construction all risk insurance and services to projects shall be included in asset costs, either explicitly, or e.g. as D&E.

4.7 REPORTING OF ASSET COSTS

Total installed costs per unit/facility shall be calculated as stated above and recorded in the asset register.

A list per asset shall be drawn up, stating all equipment etc. installed and erected within their battery limits, see (3).

The list shall clearly indicate all equipment (4.2) with a short description and its number, e.g. Crude distilling column C-101; Reboiler furnace F-1203; Gasoline reflux pump P-201; Crude oil tank T-421 and Bitumen tank T-604.

For the purpose of this list, buildings and other civil engineering items and steel structures which form part of an asset shall be registered in the same fashion as equipment although they may be constructed at site from bulk materials.

NOTE: Local conditions may require that the installed costs of buildings and other structures are given separately, e.g. due to a different depreciation allowance.

5. **ASSET SPECIFICATION SCHEDULE**

ASSET CLASSES		ASSETS	REMARKS
LAND			Including: major reclamations, major levelling costs, rights of way and leaseholds
PROCESS UNITS		Each process unit	
STORAGE, HANDLING AND DISPATCH	Bulk receiving and delivering facilities	Ship/rail/road receiving and delivering facilities for: crude oil products luboils LNG etc.	Excluding: rail tracks and weigh- bridges, wharves, jetties and anchorage
	Bulk storage facilities	Storage facilities for: crude oil products luboils LPG LNG etc.	Each including both intermediate and final storage
	Packed products filling and handling facilities	Packed products filling and handling facilities for: plastics luboil grease LPG etc.	As for bulk receiving and delivering facilities
	Blending and compounding plant	Luboil blending and compounding Grease compounding Cutback asphalt mixing TEL and dye blending In-line blending stations	
AUXILIARY FACILITIES	Steam service	Separately for each steam pressure: boiler houses/plants CO boilers waste heat boilers distribution systems	
	Electricity service	Power plants Transformer stations Distribution systems (primary, secondary)	
	Fuel heating and distribution service	Each heating plant Distribution systems	
	Cooling water service	pump houses/stations cooling towers distribution systems	

ASSET CLASSES	ASSETS	REMARKS
GENERAL PURPOSE FACILITIES	Domestic water, fire water and other water services	Water production facilities Treating units Distribution systems
	Compressed air service	Compressor plants Distribution systems
	Pump houses/stations - oil and gas	Each use separately, e.g. crude oil, products
	Interconnecting lines - oil and gas	Each use separately, e.g. crude oil, products
	Harbours, jetties and anchorages	Each wharf/jetty, single buoy mooring, set of moorings
	Process material distribution services	Each service
	Waste disposal facilities	Each facility
	Personnel facilities	Employee housing Housing service facilities Hotels and canteens Commissariats Hospitals and clinics Schools and churches Training centres Clubs and recreation facilities Other buildings, such as bathrooms, changing rooms etc.
	Sundry buildings	Offices Laboratories (laboratory equipment separately) First aid/garage buildings Warehouses (equipment separately) Workshops Other buildings
	Fire service	Each main station and foam generator Distribution systems
	Roads, bridges, drains	Site clearing
		Roads, walks, bridges, fencing, street lighting
		Railway tracks
		Sewers and drains Incinerators Sewage disposal plants Oil interceptors Flares and blowdowns Inland and coastal protection works
	Miscellaneous plants	Drum, tin and case factories Oxygen and nitrogen plants Brickworks and ice plants Concrete batch plants and similar plants
	Movable equipment	Furniture and office equipment Automotive equipment Construction equipment Floating craft IT hardware Miscellaneous equipment
		Each service
		Excluding pipelines
		All buildings and facilities excluding furniture
		All buildings excluding furniture
		As a group
		Grouped per type of asset
		Including ramps, platforms, weigh-bridges
		Grouped per type of asset (outside battery limits of units/facilities)
		Including PCs

ASSET CLASSES		ASSETS	REMARKS
COMMUNICATIONS	Telephone systems	Including telephone lines and equipment installed in plants, buildings and offices	
	Radio and television systems	Including transmitters and receivers, buildings, masts, aerials, cables and lines	

6. REFERENCES

In this DEP, reference is made to the following publications:

NOTE: Unless specifically designated by date, the latest issue of each publication shall be used together with any amendments/supplements/revisions thereto.

SHELL STANDARDS

Index to DEP publications and standard
specifications

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