

DEP SPECIFICATION

ENGINEERING INFORMATION SPECIFICATION (EIS)

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DESIGN AND ENGINEERING PRACTICE

DEM1



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PREFACE

DEP (Design and Engineering Practice) publications reflect the views, at the time of publication, of Shell Global Solutions International B.V. (Shell GSI) and, in some cases, of other Shell Companies.

These views are based on the experience acquired during involvement with the design, construction, operation and maintenance of processing units and facilities. Where deemed appropriate DEPs are based on, or reference international, regional, national and industry standards.

The objective is to set the standard for good design and engineering practice to be applied by Shell companies in oil and gas production, oil refining, gas handling, gasification, chemical processing, or any other such facility, and thereby to help achieve maximum technical and economic benefit from standardization.

The information set forth in these publications is provided to Shell companies 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 Units 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 such use, including the quality of their work and the attainment of the required design and engineering standards. In particular, for those requirements not specifically covered, the Principal will typically expect them to follow those design and engineering practices that will achieve at least 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.

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- 2) Other parties who are authorised to use DEPs subject to appropriate contractual arrangements (whether as part of a Service Agreement or otherwise).
- 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 Shell GSI.

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1. INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for the engineering information delivered to the Principal by Contractors and Manufacturers/Suppliers while reducing the need to reclassify, reformat and rework information at handover points during the project lifecycle.

This DEP contains mandatory requirements to mitigate process safety risks in accordance with Design Engineering Manual (DEM) 1 – Application of Technical Standards.

This DEP specifies the Principal's standard requirements for information and may be supplemented with additional requirements necessary to meet local needs. The exact information requirements will be dependent on the Contractual scope. The exact information requirements and any deviations or additions to this DEP is defined by the Principal in a contract specific Information Management Scope of Work (IM SoW) and IM Specification.

This DEP specifies requirements in terms of data and documents for all phases of engineering projects and as such may exceed the scope of what is delivered in a specific contract.

The overall objective is to ensure that the Contractor delivers to the Principal the minimum information required to effectively manage its assets and business, structured in a way that supports the Principal's engineering, operations and maintenance processes.

Sections (3) and (4) of this DEP describe the recognised information that the Principal may require to be handed over and the rules for the handover for documents and data, respectively. (Appendix A) contains definitions of the formats of different EIS Objects and details of their formats. Information requirements are continually developing as business processes develop, so the information published in this DEP is a snapshot at the time of publication.

This DEP does not address how information should be developed, how to verify information content, the applications used to generate the information or how it should be stored, retrieved, controlled or updated during the project or operations phases.

This is a revision of the DEP of the same number dated February 2012; 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 capitalised term **SHALL [PS]** indicates a process safety requirement.

The word **should** indicates a recommendation.

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

1.3.2 Specific definitions

Term	Definition
Application	A computer program performing special functions. Sometimes also referred to as computer system.
Area	An Area represents a part of the geographical surface occupied by a Plant. Areas are created to identify the physical location of Equipment within a Plant.
Book	A book is a binding of documents used to retain a natural grouping of documents (e.g. to record all the documents delivered in a Vendor Package, regardless of their discipline document type).
Class	Term used to classify things, e.g., a class of an equipment type could be a "pump".
Controlled Document	A Controlled Document is a document which is registered in a recognised control system at a known status and ownership. A controlled document follows specific review and approval processes. Periodically it will have its content updated and revised.
Data	Information to be manipulated by tools, e.g., Spare Parts, Tag Register & Properties, Maintenance Routines, etc.
Discipline	Field of expertise, e.g., Mechanical Engineering (see list provided in EIS Reference Data Library).
Discipline Document Type	An association between disciplines and document type names. In this DEP the term Discipline_Document_Type is a unique identifier for types of documents. This term has been developed to cater for situations where a given document type is common to more than one discipline.
Document	Information (Printed or Electronic) to be read by people, e.g., Reports, Specifications, Data sheets, Drawings, etc.
EIS Object	Any entity that Principal requires to be represented by data.

Term	Definition
EIS Property	A feature that further describes an EIS Object. Also called Characteristic or Attribute. For example, design temperature.
EIS Relation	A relationship between two EIS Objects.
Equipment	Equipment is a physical object designed to perform a Tag function.
File	A collection of information stored electronically under a specific name
Information	The sum of documents and data.
Information Quality	The fitness for use of the information provided. Inclusive of data completeness, accuracy, precision, and alignment with document and project standard metadata as detailed in this DEP, Contract IM SoW and IM Specification.
Information Security	Information Security refers to the protection of information in its broadest sense and covers access to information, protection of information against intrusion and damage and the procedures necessary to maintain the integrity of information.
Intelligent Drawing	Drawing created and managed by an application as "data". Intelligent drawings enable documents to be generated from data; they can include manufacturing know-how and design intelligence, e.g., they can include the rules to generate complex families of parts, generate bills of material, area or mass calculations.
Metadata	Collection of attributes, formats and structure belonging to data or documents. For example, metadata can describe data elements or attributes, (e.g., name, size, data type), specify formats (e.g., length, fields, columns) and structure (e.g., where it is located, how it is associated, ownership). Metadata may include descriptive information about the context, quality, condition or other characteristics of the data or documents.
Model Part	A Model Part represents a type of Equipment that is manufactured by a Manufacturer.
Package, Packaged Unit	Preassembled collection of equipment designed to deliver a process function.
Page	A page is one side of a sheet.
Plant	A plant is an assembly of equipment, assembled to perform a physical or chemical process (this includes the processes of transportation and storage of materials). A Plant represents the high level function to be performed, and during the design, a Plant is decomposed in process units and tags.
Process Unit	Process Units are created to decompose the high level Plant function into more granular sub-functions. This plant breakdown structure is used by the process engineer.

Term	Definition
Rendition	Renditions are representations of a document in a different format. The content is identical. Renditions may be required for preservation or access/viewing purposes.
Revision	A code used to identify the content of a document at a certain point in time. It is used to track the evolution of a document during its lifecycle.
Scanned Image PDF Files	PDF files scanned directly from hardcopy documents containing wet signatures and/or official stamp(s).
Sheet	A sheet is a single piece of paper and is often a one-sheet drawing.
Site	A site represents a geographical surface that can be identified on a map.
Tag Register	List of all tags at a plant.
Tag	Tags are created to decompose a high level Process Unit function into more granular sub-functions.
Transmittal	Record which accompanies a document or set of documents. It describes documents that should receive the reader's consideration, and what the reader should do with the document(s). It often contains important dates or deadlines that the reader should be aware of.
Uncontrolled Document	An Uncontrolled document is a general working document. This includes e-mails and documents stored in 'My Documents' or on network drives.
Vendor	A Manufacturer/Supplier that supplies goods or services.

1.3.3 Abbreviations

Term	Definition
AFC	Approved For Construction
AI-PSM	Asset Integrity - Process Safety Management
CAD	Computer Aided Design
CMMS	Computerised Maintenance Management System
CSV	Comma Separated Value
CTR	Cost, Time and Resources
EDMS	Electronic Document Management System
EIS	Engineering Information Specification (DEP 82.00.10.30-Gen.)
EPC	Engineering Procurement and Construction (Contractor)
GRM	Group Records Management
IM SoW	Information Management Scope of Work
OCR	Optical Character Recognition
PBS	Plant Breakdown Structure
PDMS	Plant Design Management System
PEFS	Process Engineering Flow Scheme(s)
	NOTE: Some locations use the term P&ID (Process and Instrumentation Diagram).
SCE	Safety Critical Element

1.4 CROSS-REFERENCES

Where cross-references to other parts of this DEP are made, the referenced section or clause number is shown in brackets (). Other documents referenced by this DEP are listed in (5).

1.5 SUMMARY OF MAIN CHANGES

This DEP is a full revision of the DEP of the same number dated February 2012. The following are the main, non-editorial changes.

Section/Clause	Change
All	Restructured and clarified requirements, enforced use of shall/should/may for normative statements.

1.6 COMMENTS ON THIS DEP

Comments on this DEP may be submitted to the Administrator using one of the following options:

Shell DEPs Online (Users with access to Shell DEPs Online)	Enter the Shell DEPs Online system at https://www.shelldeps.com Select a DEP and then go to the details screen for that DEP. Click on the "Give feedback" link, fill in the online form and submit.
DEP Feedback System (Users with access to Shell Wide Web)	Enter comments directly in the DEP Feedback System which is accessible from the Technical Standards Portal http://swwww.shell.com/standards . Select "Submit DEP Feedback", fill in the online form and submit.
DEP Standard Form (other users)	Use DEP Standard Form 00.00.05.80-Gen. to record feedback and email the form to the Administrator at standards@shell.com .

Feedback that has been registered in the DEP Feedback System by using one of the above options will be reviewed by the DEP Custodian for potential improvements to the DEP.

1.7 DUAL UNITS

This DEP contains both the International System (SI) units, as well as the corresponding US Customary (USC) units, which are given following the SI units in brackets. When agreed by the Principal, the indicated USC values/units may be used.

1.8 NON NORMATIVE TEXT (COMMENTARY)

Text shown in italic style in this DEP indicates text that is non-normative and is provided as explanation or background information only.

Non-normative text is normally indented slightly to the right of the relevant DEP clause.

2. GENERAL

2.1 CONTRACT INFORMATION MANAGEMENT SCOPE OF WORK

Complete and accurate information is crucial for the safe and efficient operation of a plant.

1. Unless otherwise specified by the Principal, the Contractor shall consider the full DEP to be mandatory.

Principal will issue a Project Contract IM Scope of Work and Information Specification based on this DEP to define the exact Contractor deliverables for a particular contract.

2.2 INTERNATIONAL STANDARDS APPROVED FOR USE

1. In case of conflict, the descending order of precedence for requirements shall be as follows:
 - a. regulatory requirements;
 - b. project Contract IM Scope of Work and Information Specification (2.1), including pre-purchase correspondence, clarifications and notes of pre-selection and pre-award meetings;
 - c. design and Engineering Practice (i.e., this DEP);
 - d. ISO 14224:2006, adopted without amendment;
 - e. International Standards.

2.3 INFORMATION SECURITY

Refer to (1.3.2) for definition of Information Security.

1. The Contractor shall ensure compliance with the Principal's Information Security requirements ensuring processes and procedures are in place to safeguard the following:
 - a. business continuity - minimising business damage;
 - b. confidentiality - protecting sensitive information from unauthorised disclosure;
 - c. integrity - safeguarding the accuracy and completeness of information;
 - d. availability - ensuring the project information and associated services are available to users as required.

Refer to ISO/IEC 27002 for guidance.

2.4 EXPORT CONTROLS

1. The Contractor shall ensure all deliverables are classified and assigned an appropriate Export Control Classification Number (ECCN), and that the ECCN is clearly displayed on all deliverables.
 - a. Classifications provided by the Principal shall be used.
2. The Contractor shall ensure compliance with the applicable necessary Export Controls.

2.5 APPLICATIONS USED BY CONTRACTOR

1. Where the Principal mandates the use of a particular application or template, the Contractor shall obtain the written approval of the Principal before making any changes to the application or template.

The Principal might mandate the use of specific applications or templates for the development and handover of deliverables; for example, PDMS could be specified to produce 3D models.

The Principal might host certain applications and provide remote access to the Contractor.

If particular applications or templates are not specified by the Principal, the Contractor can use its own applications or templates to produce deliverables.

2. Where the Contractor needs to convert from one format to the Principal's required format, the Contractor shall demonstrate that the conversion is done without loss of information quality.
3. If intelligent drawings are used by the Contractor, the files produced shall include all configuration, references and libraries when delivered to the Principal, such that a fully operable application can be created elsewhere.
 - a. The structure of the library and data files shall be subject to approval by the Principal prior to its creation.

2.6 INFORMATION FROM SUBCONTRACTORS

1. The Contractor shall ensure all information originated by the Subcontractors and Manufacturer/Suppliers comply with the Principal's requirements.

2.7 REFERENCE DATA

The Principal will formally issue the Contractor a set of reference data after the commencement of the Contract.

1. The Contractor shall apply the reference data set formally issued by the Principal.
2. Where the Contractor is unable to utilise the Principal's reference data directly in its business processes and applications, the Contractor shall map their existing reference data to the Principal's.
 - a. Application of the reference data by the Contractor shall determine the Principal's information requirements.

For example if a tag is classified as a centrifugal pump, the reference data will identify which properties for that pump need to be delivered by the Contractor. The property requirements for the pump would be different if a different classification (4.2.2) is used, for example pressure transmitter.

Similarly if a Document is classified (3.3.3) as a Process Engineering Flow Scheme (PEFS), this will identify the final revision of the document to be handed over is required As Built; that the native file is required and whether a translation or hardcopy is required.

- b. The Contractor shall confirm that application of its reference data delivers the Principal's information requirements.
3. The Principal may revise the reference data during the execution of the works. The Principal shall formally transmit any new revisions to the Contractor, highlighting any changes.
 4. When revisions to reference data are formally transmitted by the Principal, the Contractor shall replace any earlier revisions of the reference data and ensure future compliance with the new revision.

2.8 INFORMATION REVIEW AND APPROVAL BY PRINCIPAL

1. The Contractor shall be accountable for information quality.
2. Information quality shall be managed at source by the Contractor and not rely on review by the Principal to highlight issues.
3. The Contractor shall employ an internal information review process that ensures the appropriate technical authorities review and sign off all new or revised information.

The Principal will reject any information issued by the Contractor that has not been duly signed as checked and approved by the Contractor.

Acceptance of information by the Principal does not relieve the Contractor of responsibility for design accuracy or for compliance with applicable codes, standards or contractual requirements.

2.9 INFORMATION HANDOVER

The Principal will define details of the timing and process for information handover in a Contract IM SoW.

1. All information handed over by the Contractor, whether intermediate or final, shall be included in a formal transmittal.
2. Prior to submitting a formal transmittal, the Contractor shall ensure the following:
 - a. the information is numbered correctly according to project specifications and signed off to the appropriate level of authority;
 - b. the correct template has been used;
 - c. the information is structured in accordance with the Contract IM Specification;
 - d. the information is classified using the Principal's reference data;
 - e. all files have been virus checked.

2.10 INFORMATION FORMATS

1. Unless otherwise specified in the Contract IM Specification, the Contractor shall deliver information in the format defined in this DEP.
2. The information shall be delivered in the order that the information appears in the definition tables (i.e., the column arrangement).
3. Formats for defined EIS Objects shall not be changed during the project unless agreed by the Principal.

3. DOCUMENTS

3.1 GENERAL

1. The Principal shall define in the reference data (2.7) the requirements for different types of documents (e.g., format, status, translation and hardcopy requirements).
2. The Contractor SHALL [PS] hand over all documents identified by Principal as required as "As Built" within the following time frames:
 - a. red line versions before start up;
 - b. electronic versions within three months of start-up.
3. Delivery of all documentation (including hardcopies) shall be complete within six months of start-up.

4. The Contractor shall not deliver generic As Built or final documents (i.e., a document that applies to more than one identical system/train in a plant).

During the operations phase the different systems/trains could be modified independently.

Generic documents may be used up to Approved For Construction (AFC) to support design repeatability/replication.

5. The Contractor shall ensure the requirements in this DEP are applied to all documents created as part of their scope, including those originated by Subcontractors and Manufacturers/Suppliers.

3.2 CONTROLLED/UNCONTROLLED DOCUMENTS

A document can be considered as either controlled or uncontrolled.

1. The Contractor shall treat all deliverables to be handed over to the Principal as Controlled Documents.
2. Contractor shall implement an Electronic Document Management System (EDMS), configured to support the Principal's document control processes, including numbering, revision control, storage, searching, and retrieval of information.

3.3 DOCUMENT SPECIFICATION

3.3.1 General

1. Refer to (Appendix A, A.4) for the standard EIS Objects, Properties and Relations recognised by the Principal for document handover.

This section describes additional requirements not listed in (Appendix A, A.4).

3.3.2 Document numbering

1. The Contractor shall ensure all deliverables are numbered in accordance with the Principal's Document Numbering Specification.
 - a. This document number shall be used consistently in the document content (electronic and hardcopy) and the metadata supplied for the document.

3.3.3 Revisions of a document

1. The Contractor shall produce a new revision whenever an update of a document is issued to the Principal for formal review, approval or distribution.

3.3.4 Discipline document type classification

1. The Contractor shall classify all documents handed over to the Principal with an appropriate Discipline Document Type to:
 - a. ensure the nature of the document content is understood before the document is opened;
 - b. specify common requirements for the documents with common content, for example the need to As Build all PEFS;
 - c. facilitate document searching.
2. The Contractor shall ensure all requirements of the relevant Discipline Document Types are satisfied for the documents when handed over to Principal.

3. The Contractor shall not create documents containing the content of multiple Discipline Document Types.
 - a. Such documents should be split into individual documents per Discipline Document Type.

Documents of multiple discipline types can be formed into a book as described in (3.4.1).

3.4 DOCUMENT AND FILE REQUIREMENTS

3.4.1 Books (or binders) of documents

A book can be used to retain a natural grouping of documents (e.g., to record all the documents delivered in a Vendor Package, regardless of their discipline document type).

1. The Contractor shall create a separate document for each book:
 - a. containing a separate document containing an index for the book listing each document contained in the book by document number and description;
 - b. assign a discipline document type to the book;
 - c. identify each document in the book by a unique reference number, referenced in the index;
 - d. provide a document-to-document reference between the index document and the various documents in the book.

3.4.2 File requirements

1. Contractor shall ensure each document has at least one electronic file and meets the following requirements:
 - a. Each rendition of a document is delivered in a single electronic file.
 - b. Only drawings can have multiple sheets (for example PEFS), and each sheet is treated as a separate document. Each sheet is created as a single electronic file (multiple renditions of the same sheet may be delivered as multiple files).
 - c. Page sizes are consistent within documents.
 - d. Files are not password protected.
 - e. Any document that refers to a single Tag, item of Equipment or Model is delivered as a single file.

For example, loop diagrams are not to be combined into a single document as this will make it harder to find and modify an individual loop diagram in future. If a book of loop diagrams is required, see (3.4.1).

- f. Each electronic file is self-contained and does not require, or call, any other electronic files for viewing or updating purposes (e.g., X-Ref, shape files, fonts, templates).
 - i. For example AutoCAD files should be binded to ensure the x-refs are included in the file for handover.
- g. The maximum file size for a document does not exceed 30 MB, unless otherwise agreed by the Principal (e.g., for 3D CAD files, files rarely accessed).

Larger files might be allowed for files that are accessed infrequently.

- h. For text documents containing pictures, a picture format is used which provides sufficient print details at the minimum picture size.
- i. Electronic files accurately represent the information on the equivalent paper deliverable.

Electronic native do not need to contain the sign-off signatures for the current issue.

2. The Contractor shall ensure the file name consists of the document number, document revision and a sequence number followed by the file extension, for example T-00000002_X01-01.PDF.
 - a. The file name shall only contain alphabetic, numeric, and underscore characters (no special characters are allowed).
 - i. Underscore should replace any slashes (/ or).
 - b. It shall be possible to rename the files without affecting the viewing, editing of that file or any other file.

3.4.3 Set of files

1. Where multiple files are delivered against a single document number revision the Contractor shall use Set_Of_Files (Appendix A, A.4.5).

Examples of usage for Set_Of_Files include:

A document delivered in multiple renditions (e.g., a scanned PDF of the signed off document and an MS Word native file of a procedure).

A document with an unacceptably large file size that has been divided into multiple files of acceptable size.

A single document containing multiple file types (e.g., an MS Word® document with an MS Excel® appendix).

A single document containing equivalent information in multiple languages.

2. To create a Set of Files the Contractor shall:
 - a. nominate the primary document and treat it in the same way as any other document, giving it a Document Number and Revision;
 - b. assign the same Document Number and Revision to all other (secondary) files in the Set.
3. Each Document Title and File Name shall reflect the sequence of the files as they appear in the complete document.

Table 1 Set of files examples

Example	Document Titles
A single document and native file	Primary File Compressor Station Layout Native File Compressor Station Layout (DWG)
A large file split into multiple files	Primary File Vendor Manual Centrifugal Pump Model XYZ Subsequent File Vendor Manual Centrifugal Pump Model XYZ Sections 1 to 5 (PDF) Vendor Manual Centrifugal Pump Model XYZ Sections 6 to 10 (PDF) Vendor Manual Centrifugal Pump Model XYZ Appendix 1 (PDF) Vendor Manual Centrifugal Pump Model XYZ (DOCX)
A single document containing multiple file types	Primary File PROJECT REFERENCE DATA PROCEDURE Subsequent Native Files PROJECT REFERENCE DATA PROCEDURE (DOCX) PROJECT REFERENCE DATA PROCEDURE (XLSX)
A single document containing multiple languages	Primary File Emergency Plan Section 1 English Translated File Emergency Plan Section 2 Russian

4. Where files that exceed the limit in (3.4.2, Item 1f), the Contractor shall:
 - a. split the document at natural section breaks (indicated by section markers);
 - b. split the document at the file size limit if the document has no natural section breaks but exceeds the allowable file size;
 - c. ensure the primary file contains the front sheet and table of contents.

3.4.4 Files to be delivered

1. The Contractor shall deliver all documentation electronically (final and intermediate revisions as required).
2. A signed PDF rendition of all documents shall be delivered along with the native files where required by Principal.
3. Where the native format is paper, the Contractor shall create and deliver a PDF file.
4. If the native format cannot be converted to electronic media (for example radiographic films), the Contractor should deliver the non-electronic native format only. See (3.6) for Physical Record Handover requirements.

3.4.5 Image quality

1. The Contractor shall render PDF files directly from the authoring application as - content searchable, commenting enabled, PDF files.
2. The Contractor shall scan hardcopy documents to PDF image files ensuring:
 - a. documents are scanned at their original size directly from the original hard copy with a minimum resolution of 600 dpi for handwritten documents and 300 dpi for all other documents;
 - b. image files are produced in an orientation that allows viewing without image rotation;
 - c. all the information on the scanned image is legible;
 - d. an OCR scan on a printed version of the document results in correct character recognition of 99 % for the image.
3. The Contractor shall compare scanned images against an image quality benchmark agreed with Principal to determine if the image quality is sufficient.

3.4.6 Hyperlinks

1. The Contractor may use hyperlinks between information within the same file.
2. Contractor should only use hyperlinks to Internet sites if there is a high degree of confidence that the link will not change.
3. Contractor shall not use hyperlinks to the Contractor's Intranet or shared drives.
4. The Contractor shall not use hyperlinks between different documents;
 - a. instead document-to-document relationships shall be used in accordance with (Appendix A, A.4.15).

3.4.7 Different languages

1. For documents created in one language and translated to another language, Contractor shall agree with Principal which of the following approaches will be used throughout the project:
 - a. Preferred option: A single document generated combining multiple documents (e.g., Chapter 1 – English, Chapter 2 – Russian). In this case, they may exist as a single file, or a set of files in compliance with (3.4.3).
 - b. Alternative 1: Create a Book referencing both Documents. See (3.4.1).
 - c. Alternative 2: Two separate documents in two separate files.
2. The Contractor shall ensure processes and procedures are in place to assure the quality of the translations.

The Principal will reject any translations that do not meet the Principal's quality standards.
3. Country code abbreviations used within file names or document titles should comply with ISO 3166-1.

3.4.8 Character set

1. Contractor shall use the ISO/IEC 8859-15 character set for all deliverables.
 - a. Special characters shall not be used in attribute or classification fields.

*Examples are: à, á, â, ã, è, é, ê, ë, ô, ö, ü, ç, !, , #, \$, -, *, &, :, ", /,, or carriage returns.*
 - b. In attribute or classification fields, words that contain the following characters shall be converted as follows:
 - Replace à, á, â and ã with a.
 - Replace è, é, ê and ë with e.

3.5 DOCUMENT REFERENCES

Document References are critical to enabling the Principal to quickly find information during the Commissioning and Operations Phases.

1. The Contractor shall identify EIS Objects that are referenced on documents and provide this data to the Principal in a document references file. See (Appendix A, A.4.8) to (Appendix A, A.4.16).

The use of intelligent design tools significantly reduces the effort involved in preparing document references.

The ASSET_TYPE_REFERENCE property in DOCUMENT_TYPE (Appendix A, A.4.4) suggests the type of EIS Object that the document is expected to contain.
2. The Contractor shall ensure that Approved For Construction and later revisions are issued with a complete set of document references.

3.6 PHYSICAL RECORD REQUIREMENTS

The Principal's intention is to maximise electronic information exchange. However, to comply with local regulations or working practices, final delivery of both electronic and hardcopy (original signed) versions may be necessary. Paper or hardcopy is required for some legally binding agreements and for certificates carrying original signatures or marks that authenticate a document.

1. Where both electronic and hardcopy versions are submitted the hardcopy formats shall be deemed to be the original native format.
2. The Contractor shall ensure that hardcopy and electronic renditions of the same document are identical at time of handover to the Principal.
3. The Contractor shall maintain and hand over all physical records (media files, X-ray films, core samples, etc.) produced during the execution of the works as required by Principal.

3.7 EQUIPMENT RECORD CARDS

Equipment Record Cards (ERCs) can be used by the Principal's inspection and maintenance sections for establishing a basic record of the design and construction data for all items of installed equipment, and subsequently for building up the history of each item throughout its operational life.

ERCs can be used to make readily available, in concise form:

- *all relevant data on a specific piece of equipment as installed at site;*
- *the history of the equipment during its lifetime.*

The ERCs templates available for different types of equipment are listed in (5).

Three main types of data are entered on the ERCs:

- *initial (design and construction) data;*
 - *service (operational) data;*
 - *historical (maintenance) data which includes modifications, plant changes and failures.*
1. If ERCs are required by Principal the Contractor shall populate the initial (design and construction) data in the relevant template and deliver the completed ERC forms as documents (including the native files) and manage them as specified in (3.4) of this DEP.
 2. The Contractor shall ensure that design and construction data is derived from a valid source.

Relevant sources include:

 - *the relevant data/requisition sheet(s) completed and verified by the Manufacturer/Supplier;*
 - *the Manufacturer/Supplier's drawings, latest issues and stamped 'approved for construction';*
 - *the manufacturing report(s).*
 3. Data shall not be obtained from the Contractor's or the Manufacturer/Supplier's quotations for equipment as such data is often at variance from either specification requirements or the 'as-built' situation (or both).
 4. The data source should be indicated at the time of filling in the ERC.

This is particularly important for key data such as design pressures and temperatures. Such indications add greatly to the authenticity of the data and make cross-referencing/auditing simpler.
 5. Some of the initial data might also be requested by the Principal in the data properties requirements referenced in (4.2.2). Where this occurs, the Contractor shall ensure the values are consistent.

4. DATA

4.1 GENERAL

Data is essential to enable the Principal's business processes and the applications that support Asset Integrity (AI-PSM) and Operations, including but not limited to:

- *Identification of Safety Critical Elements (SCEs) and Operational Performance Standards Assurance tasks*
- *Population of the Completions Management System*
- *Risk and Reliability Maintenance Analysis to identify relevant maintenance activities*
- *Population of the Computerised Maintenance Management System (CMMS) and Corrosion/Inspection Management Systems*
- *Spare Parts Interchangeability (see DEP 70.10.90.11-Gen.)*

Fundamental to these processes and applications is the availability of a complete and accurate Tag Register.

1. The Contractor SHALL [PS] handover a complete As Built Tag Register for their entire scope (including Manufacturer/Supplier Tags) in accordance with this DEP and the Principal's Tagging Specification.
2. The Contractor shall ensure that all data delivered is consistent with the corresponding information that appears in the latest approved revisions of issued documents.

4.2 DATA SPECIFICATION

The Principal's data requirements are split into two sections:

- *plant Breakdown Structure (Appendix A, A.2);*
- *classification (Appendix A, A.3).*

4.2.1 Plant breakdown structure

The Plant Breakdown Structure (PBS) defines the hierarchy of EIS Objects and the relationships between them. (Appendix A, A.2) defines the PBS recognised by the Principal for data handover.

4.2.2 Classification

The Classificationclass of the tag, equipment or model part EIS Object is used to define functional and physical data properties requirements. For example, the Tag Class "centrifugal pump" can have the property "pumped liquid". (Appendix A, A.3) defines the EIS Objects, Properties and Relations recognised by Principal for data handover.

A list of classes and their property requirements are defined in the reference data (2.7) provided by the Principal.

5. REFERENCES

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

- NOTES:
1. Unless specifically designated by date, the latest edition of each publication shall be used, together with any amendments/supplements/revisions thereto.
 2. The DEPs and most referenced external standards are available to Shell staff on the SWW (Shell Wide Web) at <http://sww.shell.com/standards/>.
 3. The Equipment record cards are Microsoft Excel® (xls) files.

SHELL STANDARDS

DEP feedback form	DEP 00.00.05.80-Gen.
Equipment record card - General	DEP 30.00.00.80-Gen.
Equipment record card - Heat exchanger shell	DEP 31.21.01.80-Gen.
Equipment record card -Tube bundle	DEP 31.21.01.81-Gen.
Equipment record card - Barometric condenser vacuum equipment	DEP 31.21.01.82-Gen.
Equipment record card - Air-cooled heat exchanger	DEP 31.21.70.80-Gen.
Equipment record card - Columns	DEP 31.22.00.80-Gen.
Equipment record card - Pressure vessel	DEP 31.22.00.81-Gen.
Equipment record card - Fired steam boiler	DEP 31.24.00.80-Gen.
Equipment record card - Furnace	DEP 31.24.00.81-Gen.
Equipment record card - Air preheater	DEP 31.24.48.80-Gen.
Equipment record card - Conveyors/elevator	DEP 31.27.00.80-Gen.
Equipment record card - Weighing equipment	DEP 31.27.04.80-Gen.
Equipment record card - Mixing equipment	DEP 31.27.10.80-Gen.
Equipment record card - Gearbox	DEP 31.29.00.80-Gen.
Equipment record card - Centrifugal pump	DEP 31.29.02.80-Gen.
Equipment record card - Reciprocating pump	DEP 31.29.12.80-Gen.
Equipment record card - Rotary displacement pump	DEP 31.29.22.80-Gen.
Equipment record card - Axial pump	DEP 31.29.32.80-Gen.
Equipment record card - Centrifugal compressor- blower	DEP 31.29.40.80-Gen.
Equipment record card - Reciprocating compressor	DEP 31.29.43.80-Gen.
Equipment record card - Fan	DEP 31.29.47.80-Gen.
Equipment record card - Reciprocating vacuum pump	DEP 31.29.53.80-Gen.
Equipment record card -Rotary vacuum pump	DEP 31.29.56.80-Gen.
Equipment record card - Steam turbine	DEP 31.29.60.80-Gen.
Equipment record card - Gas turbine	DEP 31.29.70.80-Gen.
Equipment record card - Internal combustion engine	DEP 31.29.80.80-Gen.
Equipment record card - Steam engine	DEP 31.29.85.80-Gen.
Equipment record card - Safety relief valves	DEP 31.36.90.50-Gen.
Equipment record card - Pipelines	DEP 31.38.00.80-Gen.
Equipment record card - Electric motor	DEP 33.66.05.80-Gen.

Equipment record card - Fixed roof tank	DEP 34.51.00.80-Gen.
Equipment record card - Floating roof tank	DEP 34.51.00.81-Gen.
Equipment record card - Spherical pressure tank	DEP 34.51.00.82-Gen.
Equipment record card - RLG tank	DEP 34.51.00.83-Gen.
Spare parts	DEP 70.10.90.11-Gen.
Design Engineering Manual DEM 1 – Application of Technical Standards. https://eu001-sp.shell.com/sites/AAAAA8432/CF/Web/Design_Engineering_Manual_1_DEM1.aspx	DEM 1

Safety Critical Element Management Manual	SR.14.11269
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INTERNATIONAL STANDARDS

Codes for the representation of names of countries and their subdivisions – Part 1: Country codes	ISO 3166-1
Petroleum, petrochemical and natural gas industries – Collection and exchange of reliability and maintenance data for equipment	ISO 14224:2006
Information technology — Security techniques — Code of practice for information security controls	ISO/IEC 27002
Information technology – 8-bit single-byte coded graphic character sets - Part 15: Latin alphabet no. 9	ISO/IEC 8859-15
Industrial automation systems and integration – Integration of life-cycle data for process plants including oil and gas production facilities. — Part 4: Initial reference data	ISO/TS 15926-4

