Delivery of Technical Records

GDF SUEZ Energie Deutschland AG

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External

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Abbreviation/acronym	Meaning
AFD	Design documentation
AchD	Achievement documentation
AchD-D	Planning documentation
AchD-P	Product documentation
AG	Costumer
PDS	Plant designation system
AN	Supplier
OM	Operating manual
CAD	Computer-aided design
DCC	Document Kind Classification Code, according to DIN EN 61355
DIN	"Deutsches Institut für Normung" (German Standardisation Institute)
DMS	Document Management System
AppD	Approval documentation
GSED	GDF SUEZ Energie Deutschland AG
GC	General contractor
IBS	Commissioning
-	-
LIR	List of information requirements
ISO	International Organisation for Standardisation
PPIS	Power plant identification system
ACD	Assembly & commissioning documentation
QVD	Quality verifying documentation
VGB	"Verband der Großkraftwerksbetreiber" (Major Power Plant Operators' Association)
VGB-R	VGB directive

Terminology

Term	Explanation
Acceptance	Statement made by the client to the contractor that deliveries and services have been performed in line with contractual obligations, whereupon risks are transferred to the client. The acceptance procedure marks the start of the warranty period.
Plant designation system	Used to assign designations to a plant, plant segment or unit. Denotes the unique designation of a plant component.
Change	A change is an agreed establishment of a new state in place of the previous state.
Change index	A change index is an identifier that specified a certain engineering status in connection with a part number.
Plants	Overarching term used for buildings, the fittings contained therein, technical systems and installations, machinery, apparatus, devices, tools and control systems.
As-built documents	Reflect the current status as implemented upon handover of the plant
Achievement documentation	Contains the documents that illustrate the technical performance, contents and location of the plants.
Fittings	Fittings encompass all technical installations required to perform a technical task. Examples of fittings are drives, motors, measuring transducers etc.
Component	Used as a synonym for fitting.
Component type	Type designation (ID) for a type-compliant part.
Usage guide	Document that forms the basis for the usage of fittings.
Operating guide	Information from the manufacturer that is used to educate the user in the safe and appropriate use of the plant and its components.
Operating guides for the overall plant/systems/sub-plants (in accordance with VGB R171)	These present all information that the contractor (manufacturer, supplier, general contractor) considers to be required on the basis of the statutory requirements for the bringing of a product into service to ensure that the safety and health of the user or third parties is not jeopardised as long as the product is used appropriately.
Operating instructions (in accordance with VGB R171)	Operating instructions for employees and operating personnel to ensure that plants, equipment and working materials are used safely. Operating instructions may be derived from general user information supplied by the manufacturer/supplier.
Operating manual (in accordance with VGB R171)	A compilation of all information (operating guides, operating instructions, organisational instructions, de-energising lists etc.) that the client of a plant (operator) requires for their own and external personnel in a plant. They prepare the documents themselves (based on operating guides from the contractor) and warrant that the use of these will ensure the safe operation and maintenance of the plant and the health and safety of the operating personnel and third parties (in and outside of the plant).
Method of presentation	The manner in which information is presented, e.g. image, drawing, schematic, chart, circuit diagram, map, table, list, body of text
Data carrier	A data carrier is a material on which data is stored and from which it can be recovered again.
Date	The version date, if none is yet present on the document, is the creation date. When the document is revised, the date of the revision is used.
Document	The document is information on any type of data carrier.
Document kind (according to DIN EN 61355-1)	Type of a document, defined in relation to the information it contains and the method of presentation used.

Term	Explanation
Document kind classification code (according to DIN EN 61355-1)	Document kind classification code (DCC)
Document kind classification (according to DIN EN 61355-1)	Group of document kinds with similar properties relating to the information they contain, regardless of the method of presentation used. This is expressed in the document kind classification code (DCC) of DIN EN 61355-1.
Document identifier	Identifier for a certain document in relation to an object allocated to the document.
Document set (according to VGB R171 and DIN EN 61355-1)	Compilation of various documents that are to be treated as a single unit. A document set within the meaning of R171 can be assigned to its own classification (document kind, object identifier) using metadata.
Document Manager	Is responsible for ensuring that content and formal requirements pertaining to the presentation and provision of documents are adhered to.
Installation Declaration	Issued by the manufacturer for an incomplete machine. It must contain a notice that a machine or plant in which this component is installed may not be brought into service until conformity with directive 2006/42/EC has been established. The statement must also contain the following information: • Company name and the address of the Declaration issuer • In addition to the description, also information for identification purposes (designation, function, model, type, serial number, commercial designation); • Name and address of the manager resident in the EC and responsible for the documentation. Note: May also be a legal entity; • A statement on which requirements of the Machinery Directive have been applied and a statement that the technical documents have been prepared in accordance with Annex VII B; • A declaration of obligation to transmit documents to government bodies upon justified demand; the form of transmission must also be specified; • Information on the person signing the Installation Declaration on behalf of the issuing party. The Machinery Directive prohibits the use of the CE mark for incomplete machines. Since 29 December 2009, the Installation Declaration has replaced by law the Manufacturer's Declaration previously required under the Machinery Directive 98/37/EC of 26 June 1998.
Individual document	A document that contains certain information on one or more objects. The information contained in an individual document and, if appropriate, its method of presentation enable the unambiguous allocation of an individual document to a document kind.
Equipment	Part of the plant capable of assuming a functional role (e.g. power generator).

Term	Explanation
Hazard assessments	All work with potential effects on the health or safety of employees or the environment must undergo a hazard assessment (including risk analysis) before this work is commenced. Hazard assessments cover the following points: • Identification of hazards from activities and environmental influences • Identification of the resultant risks • Establishment of safety/security measures aimed at reducing the residual risk • Controls to determine effectiveness of the implemented measures (repeat risk assessment)
Maintenance (according to DIN EN 13306)	Combination of all technical and administrative measures, along with management activities, performed during the lifecycle of a unit and aimed at maintaining or restoring its state of functionality to enable it to perform its due function.
Cold start	Starting an object outside of process conditions.
PPIS	Used to assign designations to a plant, plant segment or unit. Denotes the unique designation of a plant component.
Conformity assessment procedure	Defines the process of demonstrating that established requirements pertaining to a product, process, system, person or position are met.
Supplier	A company that supplies plants / plant parts within the context of a delivery order.
Metadata	Data used to describe and manage documents (EN 82045-1)
Hybrid document (according to VGB R171 and DIN EN 61355-1)	Document containing different information components, with each component allocable to a different document kind.
Assembly drawings	Group or assembly drawings that illustrate how individual parts interact with one another.
Object	An object in a plant is a perceptible unit as treated singularly in a planning, erection, operating or maintenance process. The boundaries of this perceptible unit may be defined in material (equipment, materials, hardware) or non-material (task, effect, signal, space) terms.
Original	The document that always represents the most up-to-date version and serves as the basis of changes and reproductions. Regardless of the number of copies, there can only be one original. The data carrier used does not influence the state of originality of the document. The original can therefore be physical in the form of a transparency, digital, or in another form.
Planning documentation	Documents prepared during the planning phase, containing the technical concept and the planned performance of a plant's construction.
Product documentation	The collective body of the documents used for the technical construction, operation and maintenance of a plant, plant segment, component or a unit.
Project	A project is a range of planned, agreed and guided activities with start and end times that is largely defined by the unique character of its conditions as a whole. Projects are performed in consideration of constraints relating to time and resources (e.g. money, expense) to meet targets. They are clearly separate from other projects.

Term	Explanation
Project types	The following different types of projects are used: • New power plant constructions • Renovations, expansions and retrofits • Demolition • Major maintenance measures (e.g. revisions).
Project documentation	The collective body of documents (Technical Records and project management documentation) generated through the planning of the construction of a new plant or the modification of an existing plant within the scope of a project.
Project management documentation	Contains all documents that mainly provide information on the management and monitoring of • Deadlines • Resources • Costs • Quality standards and which are required for certain activities such as planning, erection or commissioning, as well as documents that mainly contain information on workflows and rules for the various activities.
Quality verifying documentation	This contains CE declarations, Manufacturer's Declarations, materials testing documents, acceptance documents, including acceptance and testing certificates and reports.
Technical Records	The collective body of relevant technical documents pertaining to the structures and plants of GDF SUEZ in the planning, construction, bringing into service, operation and demolition phases. Plant documentation includes drawings/schematics, written records.
Functional location	Refers to a plant, plant segment or unit; functional locations may be structured according to functional, process-based or spatial criteria.
Sub-plant	Part of a processing plant that can be operated independently, at least temporarily (DIN EN ISO 10628).
Documentation sub-groups	Excerpts from the Technical Records, depending on the type of documentation, e.g. achievement documentation, approval documentation etc.
Version	The version indicates how up to date a document is on the basis of the index, date and status.
VGB Power Tech GmbH	A European professional association for electricity and heat generation – a voluntary union of companies for whom the operation of power plants and the associated machinery is a important basis for their commercial activities.
Backup documentation	Backup documentation are those documents and data that enable the plant to be operated and maintained and crisis situations to be overcome in the event of the loss or destruction of or restricted access to the achievement documentation stored in the power plant. Such documents must be ideally stored on secure data carriers at a location away from the sphere of influence of the power plant. The nature and scope of the backup documentation to be provided must be agreed before the contract is concluded. Where no agreements are in effect, the backup documentation is a copy of the handover documentation.

Chapter A
Introduction

0 Introduction

Rules on the preparation, handover, receipt and provision of Technical Records are established in the following chapters and concern:

- the scope and preparation of the overall documentation,
- the form in which key data and documents are to be provided and
- how documentation is to be integrated into the Document Management System. The Technical Records include:
- all documents pertaining to the operation of the plants
- all documents pertaining to the building and its fittings.

Expanded scope!

In addition to the Technical Records, the Energy Generation division of GSED also manages the following document kinds.

- Licences

1 Framework conditions

1.1 Legal framework

According to German legislation, the Technical Records are a main component of a plant as shipped. If the Technical Records are not delivered in an up-to-date and complete form, the entire shipment is deemed to be incomplete. The Technical Records also include the fittings, equipment and services not encompassed by the Machinery Directive but which are part of the deliveries and services that the contractor is mandated to provide.

The Technical Records to be prepared and delivered are based on the directive 2006/42/EC (Machinery Directive), which has been implemented into German law in the form of the 9th ordinance of the German Product Safety Act.

In addition to these two legislative elements, there are also a variety of other laws and regulations that apply. Examples of these are listed under *item 5* of this policy. For example, the German Product Liability Act governs the severity of actions and the consequences of such actions..

2 Technical provisions

GSED has established VGB-R 171 to be the binding set of rules pertaining to Technical Records The following internal policies also apply:

- Location-specific plant designations (PPIS/PDS)
- Specific DCC provisions as per Appendix 1b
- General Terms and Conditions of Purchasing
- Local IT security policies
- and the General Terms and Conditions of Business.

2.1 Document identifiers

2.1.1 General structure

The minimum required classification identifiers must be specified with the following information in the secondary data:

- Project allocation
- Location/power plant allocation
- Plant allocation (plant location)
- Document contents (system, unit)
- The document kind (DCC).

These identifiers specify the scope of the plant illustrated and described in the document and the information contained within. The contents of the document are always described in the document identifier with a PPIS code (PDS). If the document covers multiple structures, structural parts or plant parts/equipment, the contents of the document are to be described using the main PPIS code. The identifier elements are used to describe each document and each version of the document in a manner so that they are unique and cannot be confused. The technical documents are assigned a mandatory identifier. This information is also provided in the drawing header/text field. The necessary identifiers are recorded on the document in line with formal rules.

Composition of the identifier:

- Object identifier (plant, functional location with PPIS code and integrated areas, or equipment and component type)
- Document kind of classification code (as per DCC)

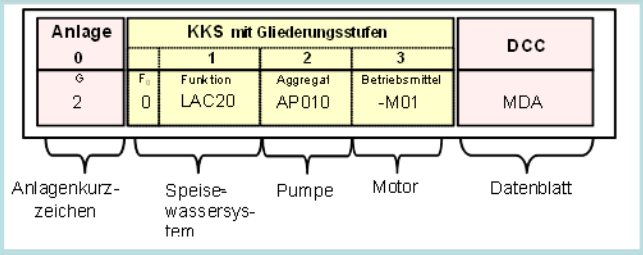

Illustration 1 Construction of the document labelling

2.2 Classification identifiers

2.2.1 Power plant identification system (KKS) identifier

The application of the PPIS is established and required in location-specific policies. This information is submitted to the supplier upon conclusion of the contract.

2.2.2 Document classification in accordance with DCC

The DCC system to be applied is in line with directive VGB-B103, must be used for the classification of the Technical Records of GSED plants in line with Appendix 1

"DCC Overall" and is submitted upon conclusion of the contract.

2.3 Identifiers / required metadata

Item 4.4.3 of VGR-R 171 defines the minimum requirements imposed upon identifiers and metadata. This applies here accordingly. The version describes the relevant update status of a document and is defined by the elements 'change index', 'date' and status.

For the purposes of submission, completeness checks and further processing in a Document Management System, the metadata of technical documents and their specific attributes are entered into the template "Template SAP DMS Uploaddatei.xlsx" provided in Appendix 2.

3 Preparation and delivery of documents

The contractor must observe the requirements of the client and monitor compliance with the performance policy when sub-contracting. The contractor is required to do this. Failure to observe this will result in the contractor being liable to compensate the client for any loss or damage incurred. The client assumes that the documentation will already be prepared in fully electronic form during the planning process and that it can therefore be provided to the client in electronic form at regular intervals at short notice without additional expense once planning has commenced.

3.1 Preparation of documents

3.1.1 General requisitioning of documents and data

- Documents and information are complete, processable and can be submitted via IT system, submission of samples for inspection if necessary prior to delivery.
- Data must be created in the file formats used by the deployed software. Documents are submitted on CD-ROM or DVD-ROM in a form readable by a Windows XP/Windows 7 PC with a standard DVD-ROM drive.
- Any write-protect passwords for the documentation must submitted to the client without further request.
- The final data is to be submitted "as built".

3.1.1.1 Special IT applications with associated data

Certain data is closely linked to a specific application (e.g. 3D CAD data), and their conversion (e.g. into a tabular XLSX format) would render them non-functional. The client would not be capable of using this data without information loss. In this case, it is necessary to not only provide the client with the drawings and the data itself, but also the user information from the systems (see 3.1.4) in a processable form, such as the blocks, layers and attributes used in AutoCAD to generate these.

This includes in particular:
- A database with lines (inter-room, interim connections etc.),
- All logical diagrams due to their being integrated into the control system's configuration software,
- 3D CAD models.

3.1.2 Preparation of drawings

Schematics and drawings must be prepared in line with applicable standards and regulations. A detailed legend of the used marks, dimensions and scales must be included in the Technical Records. The CAD formats specified under chapter 3.1.4 must also be used. The header must be set as defined by EN ISO 7200 or as defined by the format "GDF SUEZ Header", provided as an example in Appendix 3. An list of examples of applicable standards is provided in Appendix 3a.

3.1.2.1 Plant and module geometry

The contractor must provide the data for the plant and module geometry as a 3D model. This concerns the geometric description of major plants (e.g. turbines, boilers, transformers etc.) This also applies to technical packages developed by the contractor. In this case, this also applies to smaller plants (e.g. filters, pumps, power switches etc.) and bulk goods (e.g. pipes, heating, air conditioning and ventilation technology, cables, boards etc.) as well as supports for steel and concrete structures. The data should be submitted at regular intervals and upon major revisions. The model can be limited to its external surface and tied to a precise location. Details on points of intersection with other areas in which other contractors are also involved must also be specified.

3.1.2.2 Functional data for modules

In the case of pre-fabricated modules, schematics such as P&I diagrams, electrical diagrams and control diagrams must be supplied with every major revision. These schematics should be provided in a vector CAD format with a documented file structure.
The designers must also be provided with any other relevant design data, in particular data on electrical supplies to devices and data for instrumentation.
The specific design data to be supplied for the instrumentation and electrical supplies to the various devices must be agreed with GSED. This data must be available in the form of ASCII files. The various fields are separated using tabs.

Depending on whether the instrumentation is part of the order, the engineering data for the instrumentation may also need to be provided as well. The same applies to the data relating to the electrical supply.

3.1.2.3 Assembly date

CAD-drawings of the parts must be delivered as-built. If three-dimensional models have been used to create CAD drawings, these must be also delivered.

3.1.3 Preparation of records and identification of digital documents

3.1.3.1 Preparation of records

Documents such as records and correspondence can be prepared using standard software for Windows, the versions of which can be found in chapter 3.1.4.

Text elements must be delivered with the following settings:

Font	generally non-serif (e.g. Helvetica or Arial)
Font size	For body text 10 point., for headers 12 point
Font attributes	generally permitted (e.g. bold, underlined etc.)

PDF/A files may only contain one document. They must not be used to combine multiple files or whole folders. If content is combined in a single file (e.g. hybrid documents as per VGB R 171), an electronic table of contents must be provided (e.g. PDF bookmarks or shortcuts via hyperlinks) that enables specific content to be directly selected and called up.

3.1.3.2 Identification of digital documents

Digital document identifiers adhere to the following pattern. An underscore "_" is used as a separator between the document number segments.

Supplier	*Project-number*	*PPIS/PDS*	*Documentent kind of classification code* **DCCxxx**	*Part/Page:* **000**	*Version:* **00**	*Long text*

Example: *„Flender_01234_K0LCB10AP001MK01_MDC010_000_03_BA3100-Kupplung.pdf*

Accented characters must not be used. If necessary, they must be rewritten (German ä -> ae). Directive VGB B108 "Directive on structures of designations and their application in power plant engineering" must be applied To maintain clarity, a hyphen may be used as an identifier within a number segment. Due to technical restrictions, the total number of characters should not exceed *128* characters

3.1.4 Generally permitted file formats

Origin	**File format**
Word processing	Microsoft 2007
Spreadsheet	Microsoft Excel from vers. 2010; if agreed exception vers. 2007
Presentations	Microsoft PowerPoint vers. 2010
Databases	Microsoft Access from vers. 2010; if agreed exception vers. 2007
Flowchart presentation	Microsoft Visio from vers. 2010; if agreed exception vers. 2007
Image file formats	*.tif, *.bmp, *.jpg, *.gif, *.eps

Origin	File format
Platform-independent (protected documents)	PDF from ***version 1.4*** and PDF/A
Data from CAD systems	The following native formats are to be used: • Microstation ***J or V8*** (.DGN file, binary) for multi-dimensional models/drawings and P&ID • AutoCAD from version ***2010*** (.dwg file, binary) for electrical schematics and control diagrams Alternatively: • DXF, ASCII encoded • IGES, optional international ISO, ASCII encoded Note: The contractor must give preference to these formats in descending order.
Pressure drop calculations, pipe dimensioning	Conval Software package from F.I.R.S.T. "Gesellschaft für technisch-wissenschaftliche Softwareanwendungen mbH" or Software applications of Aspen Technology Inc.
Compression files	WinZip (*.zip) in agreed exceptional cases

3.2 Scope and submission of documents

3.2.1 Records, documents and data to be submitted

Scope of delivery

The Technical Records must be delivered within the established framework conditions in accordance with Annex VII of "DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL" (Machinery Directive):
The minimum scope of the Technical Records and technical data is governed by directive VGB R171.

3.2.1.1 Primary technology

Required lists

- Overall table of contents
    - Verbal description of the location and brief description of process
    - How is the new plant integrated into the existing location?
    - What sort of plant is the new plant?
    - How is the plant configured?
    - Which environmental aspects does the new plant cover?
    - Specify the plant's main parameters (performance, fuel consumption, emission values)
    - Site plan
- Overall identifier list with all identifier numbers, plain text designations and abbreviations
- Tank list
- Valve list
- Pipe list
- Sign list
- Drawing list
- Electrical costumer list (e.g. motor list)
- Measurement point list
- Limit value list

3.2.1.2 Machinery and process technology

- Formatting in line with sub-plants as per identifier system (up to functional level)

- e.g. boiler system, steam circulation system, turbines, condensation circulation system, cooling water circulation system, fuel supply system, secondary circuits
- Device documentation (manufacturer product documents)
- Individual documents are grouped according to their use, e.g. operation, maintenance, testing & maintenance guide, product, and are structured using relevant identifiers and the classification system (DCC)

Machine technology

Required list

- Table of content
- Unit list
- Testing lists, including information on regularity and scope
- Valve list
- Container and apparatus list
- Blower and fan list
- Lifting equipment list
- Duct list
- Pipe list
- Safety valve list
- Lubrication list/lubricant list: Each of the lubrication positions, the position numbers, plain text designations, location based on room identifiers (including plain text designation), lubricant, lubrication cycle etc. must be documented in an Excel table. To this end, the client/general contractor will provide an appropriate Excel list upon the order being issued.
- Pump list
- Parts lists relating to identifiers in the planning documents and statements on part designations, brands, manufacturers, types, technical data, installation location and quantity

Process technology

- Interface list

Documentation of Pipeline

The following is delivered:

- Document kinds derived from processes such as
  Source material certification process
  Works documentation
  Construction site documentation
  Radiographic images, heating
  Records,
  surface crack
  Inspections,
  strength test
  magnetic particle inspection

as well as

- Associated specific for the final documentation.

3.2.1.3 Construction engineering

These documents must be arranged according to structure (identifier), building segments and DCC. The stamped original plans must be arranged in folders/binders by identifier and submitted with the following documents.

- Tables of contents
- Drawing lists
- Description of the building and their fittings
- Full documentation of foundation, structural and development work (shell, reinforcement and works plans)
  - Architectural plans
  - Location and subsurface plans

  - Assembly plans, ground plans and sectional views
  - Load plans
  - Construction performance plans (shell and reinforcement plans)
  - Development plans
  - Drainage plans
  - Steel construction plans
  - Facing plans
  - Detailed drawings
  - Plan documents for heating, air conditioning, ventilation and elevators
  - Electricity circuit schematics
- Fire safety, escape routes and fire service access plans
- Explosion zone plans
- Complete structural calculations and other calculations prepared for the project
- Operating and maintenance regulations for the heating/air conditioning/ventilation systems as well as elevator documents (system description, manufacturer documents, revision plans, instrumentation and control lists, motor lists, identifier lists, process diagrams, functional descriptions, control system function plans, electricity circuit schematics, documentation of adjustment values of control systems, list of measurement and adjustment devices with all device data) All inspection certificates and licences (including among others the inspection certificate for the initial inspection of all electrical devices as per BGV A3)

Required list

- Room books
- Door list
- Gate list
- Inspection list

3.2.1.4 Electrical technology

The descriptive documentation (e.g. compilation of product documentation for installed parts of switching systems) must be structured and delivered in the same way as the machine documentation:

- Tables of contents
- System and functional descriptions
- Functional plans, functional schematics
- Declarations of conformity
- Switching documents
- Cable duct, earthing, installation and location plans
- Transport, assembly and repair documents
- Dimensional diagrams of electrical devices
- Equipment plans
- Data sheets, maintenance and usage guides
- Risk assessments for plant parts according to Machinery Directive
- Accident prevention regulations and

Instructions required list

- Adjustment value and parameter lists
- Parts lists for plant parts
- Cable data list
- Consumer list
- Spare parts lists

3.2.1.5 Electrical process control

Products relating to the electronic process control features of systems are documented according to type using the device catalogue. The descriptive documentation (e.g. compilation of product documentation for measuring devices and modules) must be structured in the same way as the machine documentation.

- Measurement point list
- Limit value list
- Consumer list

3.2.2 Provision and handover deadlines

3.2.2.1 Compilation of handover documentation

The requirements for handover documentation are defined in VGB R171. The contractor must ensure that the plants and documentation are consistent in terms of completeness and correctness.
Upon submission of documentation sub-groups or even the complete documentation, the contractor must ensure that the recipient is provided with the means to identify which documents/documentation sub-groups are being submitted in which version and which quantity. This must be ensured by the supplier using up-to-date tables of contents.
This also applies to the handover on modern, electronic, auditable carrier media, and this must be done in this fashion from the beginning of the planning phase to the end of the warranty period.
All documents of relevance to operations must be prepared in the national language, in this case German. Alternatives are only permitted for the quality verifying documents (in English where manufactured abroad). This must be indicated beforehand.
It must always be ensured that the scope of previous deliveries and the update version can be determined and that traceability is in effect.

3.2.2.1.1 Design of documents

The design of the documentation must comply with German standards and adhere to the requirements of GSED.

Electronic documentation	• Must be prepared using the systems specified under chapter 3.1.4. • Alternate systems and versions must be agreed in writing. • Metadata (secondary data) must be submitted in structured form together with the electronic documents • Data is entered in the template, see Appendix 2 • For permitted handover formats for drawings, see chapter 3.1.4. • For permitted formats for written records and other documents, see chapter 3.1.4.
Paper format	• A4, if format > A3, additionally one copy in copy able format • Left binding edge with two standard hole-punched holes • Reserve of min. 20% for addenda for each folder • Division by documentation sub-group into folders and partitions • For each folder, overall and section table of contents • Reinforced punched holes with plastic strips for drawings • Drawings folded to A4 so that they can be folded out without removing them from the folder • Header and document identifier in accordance with GSED requirements
Digital format in physical folder	• I Table of contents enclosed on data carrier and in paper format • Labelling as on tape/folder, date of delivery, revision status, operator, plant, unit, documentation sub-group and function code Table of contents enclosed on data carrier and in paper format • Labelling as on tape/folder, date of delivery, revision status, operator, plant, unit, documentation sub-group and function code • Structure as with paper documentation • Original format and PDF-A, including associated metadata entries

	• No write protection, no passwords • Individual or hybrid documents including table of contents • To be submitted on a modern carrier medium, stored in auditable form • To be added to the folder (CD/DVD, folder insert) of the corresponding physical documentation • Only complete volumes may be submitted on a data carrier
Document compilation	• Volume identifier • Volume number • Serial number, function, designation of part • Document number with change index • Plant name • Designation of power plant and operator • Order number • Company, department if applicable, name of creator • Where changes are to be made: Type of change, change number, change date (changes shown 'clouded' while in progress). The document properties are to be maintained by the contractor. Utilised types must be labelled clearly and unambiguously.
Volume identifier	• Documentation for one system or a component as a unit • may consist of one or multiple folders • Each volume and each folder contains a cover sheet containing the version number Identifiers as per the documentation sub-group • Approval documentation AppD • Planning documentation AchD-D • Product documentation AchD-P • Quality verifying documentation QVD • Operating manual (overall plant) OM • Assembly & commissioning documentation ACD
Folder composition	• Folder spines must contain information from the cover sheet in summarised form. • The folders are listed and identified within a volume in connection with the volume number as follows: 01+ (then another folder) 02+ (then another folder) 03- (final folder in the volume). • Individual folders must be provided with a further specific list of contents with version numbers. • Documents in a volume must be identifiable and allocated to the folder/volume. • Individual folders in a volume only to be dispatched with volume cover sheet, including version update

Provisional documents must be marked “Provisional”.

System of levels for the structure and identification of Technical Records

Level 0	Technical Records	=	Sub-group of project documentation
Level 1	Documentation sub-group	=	Sub-group of technical documentation such as: planning documentation (AchD-D), product documentation (AchD-P), Quality verifiying documentation (QSD)
Level 2	Documentation groups	=	Sub-categorisation of documentation sub-group Teildokumentationen unit-specific (P1 - P5) e.g. into: machine engineering (P2), Electrical engineering (P3), Assembly manual (ACD)
Level 3	Volume	=	Sub-group of a documentation group, Combinable documentation package, e.g. identified by PPIS, e.g. as order unit for supplier
Level 4	Folder	=	Sub-division of a volume: A volume consists of one or Folders, as per volume cover sheet
Level 5	Tab	=	Sub-division of a folder into folder register in accordance Folder title page

Level structure for Documentation, Volumes and Folder

Folder spine

Folder spines must be labelled in such a way that they are durable (e.g. insert pockets).
(The folder spines must be designed in line with the example in Appendix 4 of "GSF Ordnerrückenbeschriftung.pdf"

3.2.2.2 Handover deadlines

Unless contractually agreed otherwise, the handover deadlines specified in directive VGB R171 apply. In general, for each documentation sub-group, 2x physical and 1x digital copies are to be delivered in the specified form for the commissioning process. The complete final documentation identified as being "as built" is delivered following the acceptance process and upon delivery of the final invoice.
The following applies regarding the quality documentation:
Evidence regarding inspections and acceptance processes is provided with the inspection records during "production in the manufacturer's facility", usually as a separate volume (certificate, logs, records etc.) Inspection records for work-in-progress and unprocessed parts may remain with the manufacturer. An agreement must be made regarding storage and access.

- The quality verifying documentation must be submitted in 2x physical and 1x electronic form.
- Submission of quality verifying documentation from assembly/commissioning 4 weeks after end of test operation.

Regarding quality verifying documentation for pipes, see chapter 3.2.1.2.

OM for overall plant

The information regarding the operating manual must be submitted in

- provisional form 1x; in packages.
- In the case of step-by-step start-up/commissioning processes, the document package is required for each commissioning step one month in advance
- Final version 2x printed, 1x electronic following acceptance and upon final invoice

Assembly & commissioning documentation

- For assembly, in duplicate four weeks after completion of assembly
- For commissioning documents, in duplicate four weeks prior to commencement of commissioning
- For component deliveries, the assembly instructions must be provided as standard in duplicate

4 Submission, receipt and review

All documents are delivered to the project/activity head for review and acceptance of the documentation. Technical Records should be submitted and reviewed on an item-by-item basis, and changes should be communicated promptly. Once the Technical Records and plant have been accepted, responsibility for the Technical Records and plant are transferred to the client. Without documentation, the (sub-)plant is deemed to have not been delivered.

4.1 Completeness check

The document requirements are based on the plant's configuration, which is used to define the requirements matrix with the following elements:

- Plant structure
- Associated document kind
- Creator/supplier of the documents
- Document Manager.

The list of appendices, the document classification code (DCC), the planners and suppliers in the project, the project deadlines and the internal organization are fundamental.

The requirements matrix describes the document requirements using various document classification codes (DCC) for the technical plant data. The document requirements matrix reflects the plant structure in the vertical axis. Depending on what is needed, the plant structure may be based on systems, sub-systems or equipment. On the horizontal axis, the required document kinds are linked with the individual equipment of the plant list. This creates a matrix that, specifies the document requirements for that plant.

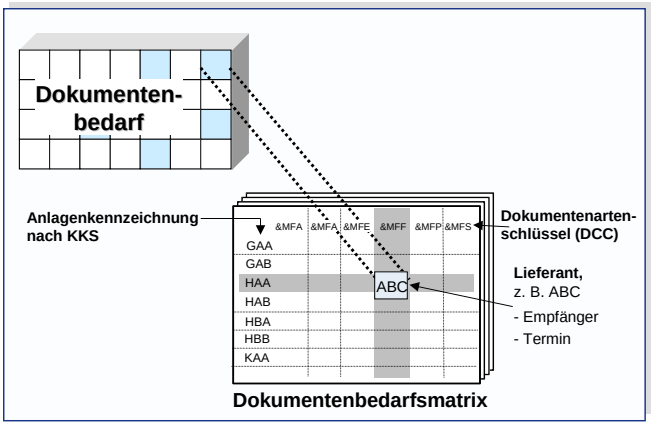

Illustration 2 Document requirement matrix

5 Regulations regarding Technical Records

The following are to be observed **in particular:**

- Annex VII of "DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND COUNCIL"
- 9th Regulation on the Product Safety Act (Machine Regulation —1st and 9th Regulations on the Device and Product Safety Act).
- VGB R171 "Directive on the delivery of Technical Records for fossil fuel-fired and regenerative power plants"

- DIN ISO 15489-1 Information and documentation - Records management - Part 1: General
- DIN technical report on ISO/TR 15489-2 Information and documentation -- Records management - Part 2: Guidelines
- DIN EN 61355-1 "Classification and designation of documents for plants, systems and equipment"
- DIN ISO/TS 16952 (previous standard, 2010-01, replaces DIN 6779-10) "Technical product documentation - Reference designation system - Part 10: Power plants"
- Statutory requirements according to
  - EU legislation
  - German legislation
  - Laws of the Federal Republic of Germany
  - Federal regulations and administrative decrees
  - Laws and regulations of individual states
  - BSI-catalogues Basic IT security catalogues as issued by the Federal Office for Information Systems (BSI):
    B 1.4 Data security concept
    B 1.12 Archiving
    G 5.2 Manipulation of information or software and other
- Standards
  - Generally accepted engineering principles
  - Generally accepted security principles
  - Rules and regulations of the Employer's Liability Insurance Association (BGVR).
- Standards and rules of associations/groups
  - Association for Electrical, Electronic & Information Technologies (VDE)
  - German Network Operators' Association (VDN)
  - German Energy Industry Association (VDEW)
  - German Technical and Scientific Association for Gas and Water (DVGW)
  - District Heating Working Group (AGFW)
  - Association of German Engineers (VDI)
  - German Mechanical and Plant Engineering Association (VDMA)
  - Union of Technical Inspection Associations (VdTÜV)
  - European Technical Association for Power and Heat Generation (VGB)
  - AD 2000 Codes of Practice from the Pressure Vessels Working Group

The omission of a relevant and effective regulation from this list – regardless of its nature – does not exclude its applicability.

6 Appendices – To be submitted upon assignment of the order

Appendix 1 ..... 1 Dok-Typen_ DCC Systemzuordnung_2013-03-28.xlsx
Appendix 2 ..... Template SAP DMS Uploaddatei.xlsx
Appendix 3 ..... Schriftkopf Layout2 Entwurf Zolling (1).pdf
Appendix 3a ..... Anforderung an Zeichnungserstellung.docx
Appendix 4 ..... GSF Ordnerrückenbeschriftung.pdf

7 Document Manager for each project

	Document Manager for each project
Documentation	***Power Plant / Location***
Overall project	.....
Legal	.....
Electrical instrumentation and control engineering	.....
Mechanics	.....
Operating manuals	.....
Construction	.....
P&ID	.....
General/ documentation	.....

::: The right to make changes for technical reasons is reserved.