

GENERAL SPECIFICATION

DEVELOPMENT

GS EP DEV 001

Asset Objects Tagging

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1. Scope

1.1 Purpose

This specification defines the minimum requirements for the tagging of Asset objects requiring a unique identifier. It does aim to cover both the different tag formats as well as associated content, necessary to tag relevant functional items from any discipline for typical Oil & Gas facilities.

This specification is key for the implementation of a *digital information management capability* (shift from a document centric to an object/data centric approach) that Company is targeting for all its strategic Assets. Technical information is created, used & modified by different parties throughout the Asset lifecycle. The purpose of this specification is to ensure consistency of Asset objects tagging during the overall process, allowing simplified exchange & optimal use of data & documents within Company as well as with external stakeholders (Contractors, Partners, etc.).

1.2 Applicability

This specification is **not** retroactive.

Its applicability is based on **Table 1**:

Applicability	Scenario 1 Greenfield project with no integration to existing Asset(s)	Scenario 2 ^(*) Greenfield project with integration to existing Asset(s)	Scenario 3 ^(**) Brownfield project	Scenario 4 Site modification (RFM)
GS EP DEV 001	Yes	Yes (for Greenfield part only)	N/A	N/A
Legacy tagging specifications ^(*)	N/A	Yes (for Brownfield part only)	Yes	Yes

Table 1 - Tagging referential applicability

Note* - Tagging specifications (Company General and/or Project Particular Specifications) used on existing Assets at the time of their development & subsequently during Operations, up to creation of GS EP DEV 001.

Note** - Where the project scope of work impacts an existing Asset, the interest of implementing a *digital information management capability* for both existing & new technical information associated to such Asset shall always be evaluated by Company (at pre-project phase). In that case, GS EP DEV 001 can apply on top of legacy tagging specifications, considering adequate adjustments to be approved by Company.

When applicable, it shall apply conjointly with **GS EP DEV 002**:

- from Project definition phase (start of pre-project) up to Site restitution
- to both onshore & offshore (surface & subsea facilities) developments
- to Contractor, its Sub-contractors & Suppliers/Vendors.

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2. Reference documents

The reference documents listed below form an integral part of this specification.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and addendums, is the latest revision published at the effective date of this document.

Reference	Title
ANSI/ISA-5.1	Instrumentation Symbols and Identification

Total General Specifications

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and addendums, is the latest revision published.

Reference	Title
GS EP DEV 002	Reference Data Library
GS EP ELE 001	Electrical design criteria
GS EP ELE 021	Electrical design criteria for floating units
GS EP EXP 407	Implementation scheme for identification and management of Safety and Environment Critical Elements
GS EP HVA 801	Terminology, Definitions, Abbreviations
GS EP PVV 111	Piping design specification
GS EP PVV 112	Piping material classes
GS EP PVV 119	Design and fabrication of metallic piping supports - Standard for piping supports
GS EP STR 100	Offshore steel structures - General

3. Terminology

3.1 Definitions

There are five types of **statements** in this specification, the “shall”, “should”, “may”, “can” and “must” statements. They are to be understood as follows:

Shall	Is to be understood as mandatory. Deviating from a “shall” statement requires derogation approved by Company.
Should	Is to be understood as strongly recommended to comply with the requirements of the specification. Alternatives shall provide the same level of protection or performance and this shall be documented.

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May	Is to be understood as permission.
Can	Is to be understood as a physical possibility.
Must	Expresses a regulatory obligation.

Note that “will” is not to be understood as a statement.

The following terms as defined below have been used throughout this specification:

Alias tag	Alternative format of the Company Master tag. Contractors or Suppliers for example may create aliases for their own internal use. Also, some Company's Métier/Discipline applications may have some tag format constraints which necessitates creation of aliases of the Master tags.
Asset	Oil & Gas facility owned by Company, considered as a set of objects which are linked and grouped in order to realize a set of functions. Examples: FPSO, FPU, Compression Platform, LNG Plant, etc.
Asset Breakdown Structure (ABS)	Hierarchical representation of the Asset objects resulting from an orderly and exhaustive identification of its successive levels of decomposition.
Asset Data Library (ADL)	Project deliverable which represents the instantiation of the Company MDM using Company RDL, for a specific Asset and Contractor's scope of work. It contains several tables and a core set of information required to store all the data requested by the Company. Its content includes all Master tags and Alias tags applicable to the project scope of work (ref. GS EP DEV 002).
Asset object	An element or a thing which has a functional purpose on the Asset & “owns” some technical information likely to evolve over the Asset lifecycle. Most objects have physical existence (e.g. main equipment, lines, cables, etc.) but some do not (e.g. soft instrumentation). An object can appear at different level of the Asset Breakdown Structure(s) & is identified by a tag.
Attribute	Property or characteristic of an Asset object.
Class	A class is defined by its membership. It establishes a category, sort or a division of things with some common nature, grouping things by the similarity. The members of a class may be other classes or a bunch of individual items (or both) that correspond to the characteristics of that class (e.g. class of transmitters or class of pumps).
Company	TOTAL E&P or any TOTAL E&P subsidiary.
Contractor	An organisation that has contractual relationship with Company.
Data	Information converted into binary digital form.
Design Phase	Basic engineering (or FEED) and Detailed engineering studies

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Equipment	Includes major and minor equipments, and their component parts. An equipment can be moved from its functional location and often has an OEM nameplate with a serial number.
Information	Stimuli that has meaning in some context for its receiver. When information is entered & stored into a server or database, it is generally referred to as data. After processing (such as formatting and printing), output data can again be perceived as information.
Instantiation	Creation of an instance, i.e a concrete occurrence of an object from a class within a data model.
Lifecycle	Collection of phases in the life of an Asset, from the definition phase up to the restitution phase.
Line	Has been used to mean Piping, Ducting & Pipelines.
Master tag	Tag which fully conforms to the tag structure and content given in this specification and the Company RDL.
Master Data Model (MDM)	Set of entities which defines in detail the classes and their attributes required for the electronic handover of information. The Company MDM contains both the RDL & the ADL (ref. GS EP DEV 002).
Master Reference Lists (MRL)	Reference codes & descriptions to be used in relevant fields of the tag structures. Examples include System codes, Sub-system codes, Function codes, Fluid codes, etc. Those lists are all stored into the Company RDL.
Original Equipment Manufacturer (OEM)	An entity that manufactures equipment and component parts. Examples include motors, pumps, instruments, valves, etc.
Package Supplier/Vendor	An entity that designs and builds a skid, package or unit from its own manufacture and from a number of OEMs. Examples include compressor package, hydraulic package, instrument air skid, etc.
Definition Phase	Preliminary, conceptual and pre-project studies
Reference Data Library (RDL)	Managed collection of process plant lifecycle data that represents information about classes or individuals which are common to many process plants or of interest to many users. The Reference Data Library entities represent the “vocabulary” and the “grammar” authorized by the Company which shall be used by the Contractor. The corresponding tables contain data invariant between Assets (ref. GS EP DEV 002).
Suppliers	Used to mean Package Suppliers and OEMs
Tag	A unique alphanumeric code that reflects the function of an object within an Asset.
Tag generator	Tool that assures the unicity of the tag & control of its format over Asset lifecycle.

For the purpose of this specification, the definitions given in [ANSI/ISA-5.1](#) shall apply.

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3.2 Abbreviations

ADL	Asset Data Library
ND	Nominal Diameter
ESD	Emergency Shut Down System
FEED	Front End Engineering Design
F&G	Fire & Gas System
FPSO	Floating Production, Storage and Offloading
HV	High Voltage
ID	Identification
ICSS	Integrated Control & Safety System
LNG	Liquefied Natural Gas
LQ	Living Quarters
LV	Low Voltage
MCC	Motor Control Center
MRL	Master Reference List
NPS	Nominal Pipe Size
OEM	Original Equipment Manufacturer
PCS	Process Control System
P&ID	Piping and Instrumentation Diagram
PLC	Programmable Logic Controller
PSV	Pressure Safety Valve
PSS	Process Safety System
RDL	Reference Data Library
RFM	Request for Modification
SCE	Safety Critical Element
SP	Special Piping
WBS	(Project) Work Breakdown Structure

Note: Abbreviations/specific codes used in tag structures are defined in Company RDL.

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4. Key tagging requirements

4.1 General requirements

In order to facilitate data integration for the lifecycle management of an Oil & Gas facility, Company has created a Master Data Model (MDM) made of a Reference Data Library (RDL) and an Asset Data Library (ADL), described in **GS EP DEV 002**.

Contractor shall enrich, manage and handover to Company the Asset Data Library (ADL) received from Company at the beginning of the Contract execution. This ADL shall namely include tags of all Asset objects associated with its scope of work.

In order to populate Asset object tags according to the tag structures defined in this specification, Contractor shall take Master Reference Lists (MRL) content directly from Company RDL. Should any discrepancy exist between codes (such as Function codes, Fluid codes, etc.) used in this specification & those made available in Company RDL, **Company RDL shall always prevail**.

Contractor shall propose & submit to Company for approval new codes when relevant ones do not exist into Company RDL.

4.2 Master tag allocation

Tags shall be allocated to Asset objects **up to a certain level of the Asset decomposition**, allowing to manage efficiently & in a practical way Company activities and associated technical information.

Tags can be allocated to single objects or group of objects, subject to site construction/installation, pre/commissioning, operations, inspection and/or maintenance.

- All Safety and Environment Critical Elements (as per **GS EP EXP 407**) shall be tagged.
- Any other item or object installed permanently at a worksite, which is handled during one or several of above activities shall be allocated a dedicated tag by Contractor.
- Temporary items or objects supporting some of above activities may also be tagged for close follow up of their status over time (refer to **section 0**).

4.3 Master tag uniqueness & change control

Tags assigned to Asset objects shall be unique. Once the tag has been allocated, it shall not be changed or deleted unless:

- the tag has been erroneously registered;
- the tag format and/or content is not in accordance with this specification.

Modifications to a tag shall be subject to Company approval.

Once a valid tag is allocated, it shall not be deleted from the ADL. Where the tag is no longer required, its status shall be flagged as "Cancelled" or "Voided".

Each Contractor and Sub-contractor working within an overall project perimeter should be able to allocate tags "independently" without any risk of duplication (refer to **section 5.2**).

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Contractor shall submit tags covering the overall project scope to Company for validation at regular intervals (intermediate MDM/ADL handovers) as defined in the contract. Contractor shall correct tag anomalies requested by Company.

4.4 Master tag format

The Master tag formats defined in this specification are essential for data integration and the use of search engines. Company can impose on Contractor the use of a **tag generator** to assure compliance with the required tag formats.

The main Master tag format requirements are as follows:

- a. Tags shall only use dash [-] as delimiter between the different fields of the tag string. The position of the delimiter is specified in the formats given for each type of Asset object.
- b. Tags shall not include any space [] nor character different from those defined in **notation conventions** used in this specification, those are:
 - A: **Alphabetical** character. Capital Case only; (**A** to **Z**).
 - N: **Numerical** character. Digit only (**0** to **9**) and includes decimal point [.] or punctuation mark [“ ”] for piping or pipeline sizes.
 - X: **Alphanumeric** character. Can be either Alphabetical (**A** to **Z**) or Numerical (**0** to **9**).
 - (): Characters shown in brackets are **optional** and do not require any space: (**A**), (**N**), (**X**).
- c. Tags shall be written as a whole each time it is possible. For instance, whilst on 2D schematics a tag may be word wrapped (e.g. instrument tags on P&IDs), the full tag string shall be stored in the associated database.

Shorthand notations shall be avoided for tags to allow the efficient use of search engines on technical documentation. For example, 12-22-PZ-0001A and 12-22-PZ-0001B is preferred to 12-22-PZ-0001A/B or any other.

An **Alias tag** shall be created by Contractor, in addition to the Master tag, and stored in correspondance as part of the ADL, when object's tag has to be loaded into a system with different format requirements or when a tag is defined in a Package Supplier format. For example:

Master tag	Alias tag 1 (Application 1)	Alias tag 2 (Application 2)	Alias tag 3 (Package Supplier/Vendor)
21-54-PSV-0001A	21-54-PSV- 01A	/21-54-PSV-0001A	PSV-004-A

Table 2 - Allocation and aligning Alias tags to Master tag

4.5 Tagging at object function level

Tags shall remain functional and NOT be used to reflect neither the “technology” of the object (i.e. equipment type or physical class) nor its precise physical location (e.g. topside elevation, living quarter level, etc.) within the Asset as those may evolve during the Asset lifecycle.

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5. Key elements of a tag structure

5.1 Site code

A Site is a zone of industrial activity delimited by a geographical boundary, in a defined operational and organisational context. It includes Oil & Gas and non-Oil & Gas installations present inside a geographical perimeter, including networks linking the different installations within such perimeter.

The Site code is represented by **three (3)** alphanumeric (**X**) characters.

The Site code shall NOT be part of the permanent Asset object tag structure but can be added as a **Prefix code** to ensure uniqueness when handling data from several Sites.

Site codes are provided by Company.

5.2 Sector code (or Facility code)

A Sector is defined as a set of multiple Systems generally situated within a same location. The boundary of facilities which make up a Sector should match the high level breakdown of the infrastructures to facilitate Project Work Breakdown Structure (WBS) & contracting strategy. A sector in this context is a part of a plant installed for the performance of one or more specific activities or functions.

- For offshore/surface developments, it corresponds typically to installations (Central Processing Platform, Production Satellite, Living Quarter, FPSO Topsides, FPSO Hull, etc.).
- For offshore/subsea developments, it corresponds typically to SPS (Subsea Production System), SURF (Subsea Umbilicals, Risers & Flowlines), or any other main contractual packages, etc. It could also correspond to subsea well clusters (if applicable).
- For onshore developments, it corresponds typically to areas such as well cluster (well pad), Oil or Gas reception terminal, small plant such as production treatment centers, etc. For large plants, like LNG or Gas plants, a sector can cover a number of systems that have *relative autonomy*, such as a gas treatment train, common utilities, etc.

Sector codes consist of **two (2)** alphanumeric (**X**) characters. Sector codes are allocated by Company at the early stages of the development phase.

Contractor shall request the Sector Code(s) from the Company at project start.

Definition of Sectors shall mitigate risk of tag duplication between Contractors. Further guidelines related to Sector codes allocation are provided in **Appendix 1**.

5.3 System code

A System is defined as a major subdivision of an installation, mostly process or utilities, that performs a major operational function of the plant. A System includes all Asset objects that allows it to operate. The division into Systems generally corresponds to the various fluids or services being handled. Other Systems exist which provide specific services such as Safety and Housing.

The System code consists of **one (1)** numerical (**N**) character.

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A full listing of Systems codes is provided in Company RDL and **Appendix 2** for information only.

5.4 Sub-system code

A Sub-system is a further subdivision of a System. It performs a given operational function, with no or little interference from other Sub-systems. The Sub-system belongs to the System which is the most impacted in case of Sub-system shutdown.

The Sub-system code consists of **one (1)** numerical (**N**) character.

A full listing of Sub-systems is provided in Company RDL and **Appendix 3** for information only.

5.5 Function code (or equivalent)

A Function is defined as a required capability within a Sub-system such as liquid pumping, gas storage, fluid transport, flow measurement or gas detection.

The **maximum amount** of alphanumeric (**A**) characters for the Function code is provided in the relevant sections of this specification (maximum of five (5) for field instruments & instrumented functions).

The Function code used in the tag structure reflects the functional class(es) the object belongs to according to Company RDL. It differs from physical class(es) (equipment type) but relationship exists between each others. Once a physical object is identified to reside at a defined functional location, additional physical features can be captured. Such physical properties change according to the specific equipment type but the functional properties remain. For example, for a *liquid transfer pump* (functional class), a *centrifugal pump* (physical class) can be identified and will possess additional physical features such as *dimensions*, *weight*, etc.

Relationships between functional and physical classes are provided through Company RDL and a typical example is shown in **Table 3** below:

Function code	Functional class	Examples of associated physical classes
FT	Flow Transmitter	Electromagnetic Flow Transmitter
		Positive Displacement Flowmeter
		Ultrasonic Flow Transmitter
		Etc.

Table 3 - Relationship between functional & physical classes

Detailed list of Function codes are provided in the Company RDL.

Function codes for most Asset objects are grouped by discipline (through associated physical classes). A Function code shall be unique through all the disciplines except when it is common to more than one discipline.

Function codes are NOT allocated to lines (i.e. Piping, Ducting, Pipelines). Lines function is mainly identified by the fluid they transport (ref. Fluid codes, HVAC air type codes) as well as additional codes defined in relevant sections of this specification.

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5.6 Sequential number

Sequential numbering is established by type of Function (Function code or equivalent) and discriminated by the associated Sub-System code.

The **maximum amount** of numerical (**N**) characters for the Sequential number is provided in the relevant sections of this specification (e.g. four (4) for main equipments, three (3) for piping, four (4) for pipelines, etc.).

Allocation logic of Sequential numbers is **project specific** when not defined in this specification.

5.7 Suffix code

A Suffix is generally used for similar items of equipment which operate in parallel (generally redundant) in the same System/Sub-system. For example, equipment tags 12-22-PZ-0001A and 12-22-PZ-0001B represent two pumps working in parallel in the same System/Sub-system. The Suffix code shall consist of **one (1)** alphabetical character (**A**): A, B, C, D, etc.

6. Main equipments

This section covers the main equipments which are part of a plant, including but not limited to the following:

- Mechanical (static & rotating) equipments
- Lifting & handling equipments
- Piping equipments (Special Piping items only)
 - Piping addressed in **section 8**
- Instrument equipments (cabinets, junction boxes, etc.)
 - Field instruments & instrumented functions addressed in **section 7**
 - Cables addressed in **section 12**
- Electrical equipments
 - Cables addressed in **section 12**
- Telecom equipments
 - Cables addressed in **section 12**
- HVAC equipments
 - Ducting addressed in **section 9**
- Structural equipments
- Naval equipments
- Civil equipments
- Architectural/housing equipments
- Wells/drilling equipments
- Safety equipments

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Detailed list of equipments covered by the above disciplines are provided in Company RDL.

For Packages/Units, refer directly to **section 14**

For Subsea objects, refer directly to **section 15**.

6.1 Main equipments tag structure

Main equipments shall be tagged according to the format given in **Figure 1** below:

X	X		N	N		A	A	(A)	(A)		N	N	N	N	(A)
1	2	-	2	7	-	P	Z			-	0	0	0	2	A
Sector			System	Sub-system		Function					Sequential number				Suffix

Figure 1 - Tag structure for main equipments

- **Sector:** refer to **Appendix 1**
- **System:** refer to Company RDL & **Appendix 2**
- **Sub-system:** refer to Company RDL & **Appendix 3**
- **Function:** minimum of two (2) & maximum of four (4) alphabetical (A) characters for main equipments; refer to Company RDL
- **Sequential number:** from 0001 up to 9999
- **Suffix:** alphabetical character for parallel equipments: A, B, C, D, etc.

Table 4 below shows the meaning of each element of the tag structure displayed in **Figure 1**:

Main equipment tag	=	12-27-PZ-0002A
Field name	Code	Description
Sector code	12	FPU Topsides [Project specific]
System code	2	Produced Liquid Processing
Sub-system code	7	Oily Water Processing
Function code	PZ	Pump
Sequential number	0002	Pump #2
Suffix	A	Pump A (parallel equipment designation)

Table 4 – Breakdown of main equipments tag structure

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6.2 Piping equipments (SP items) tagging specific requirements

Special Piping items based on **GS EP PVV 111** shall be assigned a dedicated tag according to the format given in **Figure 2** below :

X	X		N	N		A	A	A	A		N	N	N	N	(A)	
1	2	-	2	5	-	S	P	I	J	-	0	0	0	2		
Sector			System			Sub-system		SP item Identifier			Function			Sequential number		Suffix

Figure 2 – Tag structure for Special Piping items

- **SP item Identifier:** SP

Other fields in the tag structure are as defined in **section 6.1** above.

Table 5 below shows a typical Special Piping item tag in **Figure 2** format and the meaning of each element in the tag structure:

Special Piping item tag = 12-25-SPIJ-0002		
Field name	Code	Description
Sector code	12	FPU Topsides [Project specific]
System code	2	Produced Liquid Processing
Sub-system code	5	Export/Off loading
SP item identifier	SP	Special Piping item
Function code	IJ	Injection quill
Sequential number	0002	Injection quill # 2
Suffix		(not used)

Table 5 - Breakdown of Special Piping items tag structure

6.3 Electrical equipments tagging specific requirements

Refer to single line diagrams in Appendix 1 & 2 of **GS EP ELE 001** and Appendix 6 of **GS EP ELE 021**.

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6.3.1 Bus-bars

The following convention in **Table 6** shall be used at all times for bus-bar identification. When there are more than two bus-bars, the letter **C** and subsequent letters can be used as required.

Code	Description
A	Left hand side or Front Bus-bar
B	Right hand side or Back Bus-bar

Table 6 - Bus-bar tagging convention

6.3.2 Switchgears and MCC compartments

HV & LV switchgears and Motor Control Center (MCC) drawers shall be tagged.

The compartments or drawers tag structure shall be according to **Figure 3** below:

X	X		N	N		A	A	(A)	(A)		N	N	N	N	(A)		A	(A)	(N)	(N)	(N)	(N)
1	0	-	6	1	-	I	K			-	0	0	1	0		-	B		0	2	0	3
Sector			System	Sub-system		Function					Sequential number				Suffix		Bus-bar		Column		Row	

Figure 3 - Switchgears & MCC compartment/drawer tag structure

- **Bus-bar:** as per **Table 6**
- **Compartment/drawer column:** as per **Table 7**
- **Compartment/drawer row:** as per **Table 7**; *not required for HV switchgears with only one row.*

Other fields in the tag structure are as defined in **section 6.1**.

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Switchgears and MCC compartments shall be identified according to **Table 7**:

A04	A03	A02	A01	AB	B01	B02	B03	B04
A0401	A0301	A0201	A01	AB	B01	B0201	B0301	B0401
		A0202						
	A0303	A0203				B0305		
A0204		B0406						
A0305	A0205						B0408	
	A0206							
	A0207							
A0308	A0208							

Table 7 - Switchgears & MCC compartment/drawer identifiers

The following are descriptions of the above switchgears and MCC compartments or drawers identifiers:

- A01: Bus-bar A incoming section
- B01: Bus-bar B incoming section
- AB: Coupling section between bus-bars A&B; coupling section between bus-bars B&C would be BC, etc.
- A0401, B0401, etc. represent compartments or drawers with their **two (2)** numerical (**N**) characters, respectively for associated column and row numbers.

Table 8 below shows the meaning of each element of the tag structure displayed in **Figure 3**:

Switchgear drawer tag	=	10-61-IK-0010-B0201
Field name	Code	Description
Sector code	10	FPU General [Project specific]
System code	6	Electric Energy
Sub-system code	1	Power Distribution (HV, LV)
Function code	IK	LV switchgear
Sequence number	0010	Switchgear #10
Suffix		(not used)
Bus-bar	B	Bus-bar B side
Drawer column number	02	Column 2
Drawer row number	01	Row 1

Table 8 - Breakdown of an LV switchgear drawer tag

Operational relationship between electrical feeders & supplied electrical equipment tags (generation/distribution/consumers) shall be clearly identified & provided by Contractor as part of the ADL (tag to tag relationship).