

GENERAL SPECIFICATION

Field Operations

GS EP EXP 207

Installation description structure

07	10/2012	Update following the EP reorganisation
06	01/2012	Update System/Units for subsea facilities & Turbine Driven Rotating Equipment Functional Breakdown
05	10/2008	Update System /Units and where to find Class/Characteristics
04	01/2006	Update Classes & characteristics; Subsea added
03	10/2005	Addition of "EP" root to GS identification
02	10/2003	Change system & unit code
01	06/2003	Review of systems, units, classes and characteristics
00	12/2000	Initial
Rev.	Date	Purpose of the revision

Owning entity: OPS/EXP	Managing entity: OPS/EXP
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Foreword

As the client subsidiary needs to manage its maintenance activities, one of the main Maintenance Engineering (ME) and Inspection Engineering (IE) tasks during a project phase is to issue an exhaustive equipment list and organise them in an equipment database.

As the Company operates a Computerised Maintenance & Inspection Management System (CMIMS) it is essential that all maintained items of the future facilities are accurately identified and properly structured.

Therefore, a breakdown of the facilities will be done according to a hierarchical model from the subsidiary down to the individual objects.

This breakdown is compulsory in order to plan, organise and analyse the Maintenance & Inspection works in the CMIMS. It will also allow the users to get information at any level such as:

- Equipment list and description.
- Planned maintenance and inspection activities.
- Equipment maintenance and inspection history.
- Maintenance & Inspection cost
- Spare part consumption etc.

The breakdown described herein has been designed to suit a classical technical object pyramid

It distinguishes between objects as functional locations (identified by a tag) and the installed items of equipment (identified by a specific number given by the CMIMS).

Functional location and equipment are specific terms of the CMIMS both used to describe equipment or groups of equipment of facilities as detailed thereafter.

The breakdown of the installations may be loaded in the Maintenance module of a CMIMS tool with the help of standard data loading templates.

The main CMIMS tools used by Company are UNISUP or SALSA based on SAP R/3 tool, PM module. All examples below come from these tools.

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1. Scope

The objectives of this specification are:

- To provide the requirements for building the pyramid (installations description) to be loaded in the CMIMS by Maintenance & Inspection engineering.
- To standardise the database structure, classes and characteristics of equipment at a corporate level in order to have standard Maintenance & Inspection reports allowing cost comparison whenever possible.

2. Reference documents

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

External Documents

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

Reference	Title
Not applicable	

Total General Specifications

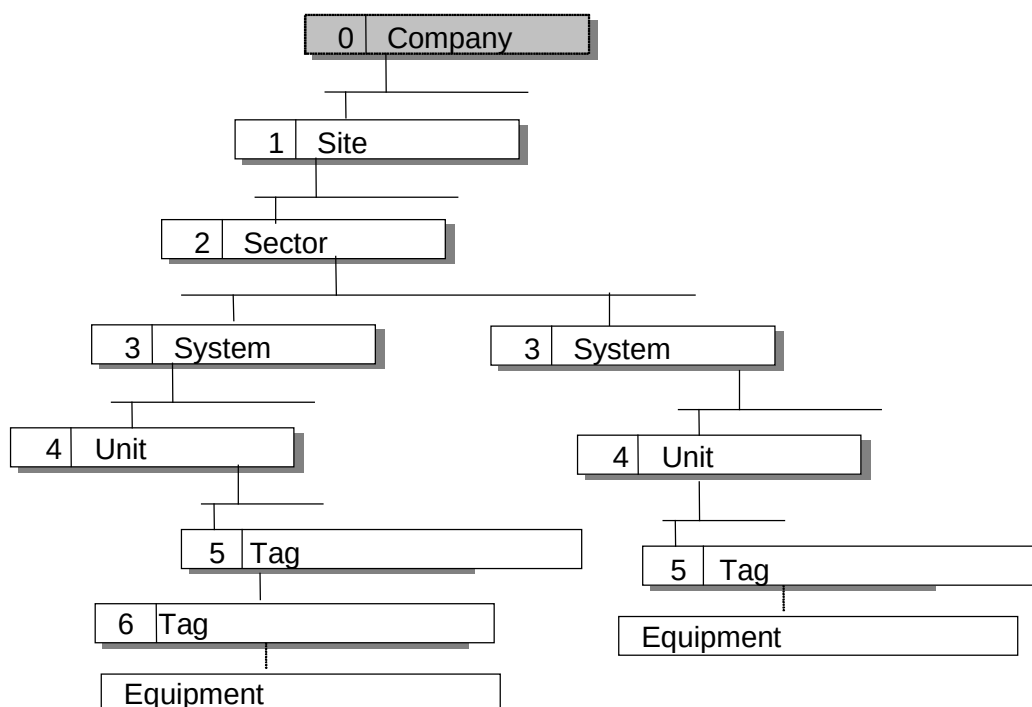
Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published in the applicable yearly collection.

Reference	Title
GS EP EXP 205	Requirements to MIE Team for spare parts
GS EP EXP 221	Data formats for UNISUP/SALSA PM loading
GS EP EXP 501	Equipment and piping Numbering
GS EP INS 102	Instrumentation identification

3. Pyramid concept

Production installations are broken down in the CMIMS according to a tree-structure of functional locations (Pyramid concept).

Structure of the Pyramid



The pyramid structure is developed according to six types of levels:

- Level 0: **Company (subsidiary). Not in FL code.**
- Level 1: **Site.**
- Level 2: **Sector.**
- Level 3: **System.**
- Level 4: **Unit.**
- Level 5: **Tag.**

The relationships between each level are “parent-child” type.

The break down is used for several aspects:

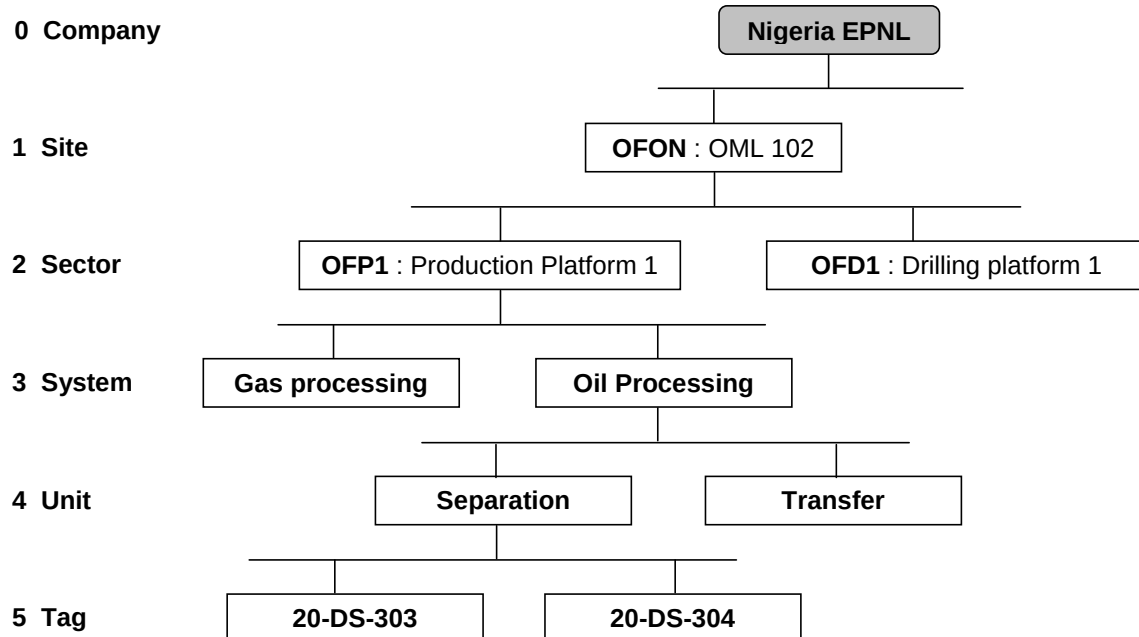
- Operation (tagging) if **GS EP EXP 501** is applied.
- Maintenance & Inspection (Work order, reporting, spare allocation, etc.).
- Commissioning (Partially when applicable).

The definition of the pyramid levels given hereafter is made to suit the main Maintenance & Inspection accounting systems.

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When it is necessary to link Functional locations that are described in different hierarchies it is possible to link those using functionality "Object links" within the CMIMS. In the case of Pressure Safety Valves (PSVs) this is a requirement in order to allow various reports to run within the reporting tool Business Warehouse (BW).

Example of a site breakdown from Nigeria (UNISUP i.e.; PM module).



4. CMIMS entity break down definition

4.1 Level 0: Company

This is the name of the operating Company e.g. TOTAL E&P INDONESIA, TOTAL E&P NEDERLAND B.V, TOTAL AUSTRAL, etc.

4.2 Level 1: Site

The Site is a set of installations included in the same operations entity. This is a geographical area where existing facilities are to be maintained.

A site may be delimited by the facilities maintained by a Maintenance & Inspection team.

There is the possibility of having several sites for which production and process facilities are maintained by the same team based in a central area. This is the case for an onshore terminal with a Maintenance & Inspection service doing interventions on several offshore sites.

The site code is given by Company

Examples:

OML100 (Nigeria), San Roque (Argentina), Khuff (Abu Dhabi), Handil (Indonesia), Dunbar (UK), Nkossa (Congo), Girassol (Angola), etc.

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4.3 Level 2: Sector

The Sector is a set of systems situated in a single geographical location. It consists of multiple process or utility systems.

In offshore situation, it corresponds to installation (Processing centre platform, production satellite, Living quarter platform, FPSO, Subsea facilities, etc.).

For Subsea facilities, the Sector SUB shall be selected. It includes Umbilicals, Flow lines, Risers, Wells and Manifolds.

In onshore situation, it corresponds to area such as cluster, small plant like a production centre.

In case of large plant like LNG gas plant a sector can cover number of systems having enough operational autonomy like train of gas treatment, common utilities, etc.

The sector code is given by Company

Examples:

- Production

Concerns the surface and subsurface production facilities:

⇒ Platform: AFD1 (Afia drilling platform 1, Nigeria), MWP-A (Multi well platform A, Indonesia), CDP1 (Norway), Cluster Saint-Faust 4 (Lacq), etc.

⇒ The wells and all enhanced recovery systems (gas lift, water injection, tertiary recovery) in a satellite.

⇒ Subsea facilities (SUB DALIA, Angola)

- Process

Concerns the facilities downstream of the well heads i.e. piping, separators, treatment, transfer, utilities, safety, etc. Example: PPA (Peciko process area, Senipah, Indonesia), KPP (Khuff Gas Process Platform, TABK, Abu Dhabi), ODP1 (Odudu production platform 1, Nigeria), D-NKP (Nkossa production barge, Congo), "Unités communes Ouest" (Lacq), etc.

All associated facilities, such as power generation only used for water injection, can be included in this Sector.

A "General Production shut down" often corresponds to a sector.

- Living Quarters

Concerns all "domestic" facilities such as living quarters, offices, workshops, warehouse, laboratory, mess, etc. It can be part of a platform (Alwyn), or a building on shore. Example: LQ (Bekapai, Indonesia), AMQ (Amenam living quarters, Nigeria), etc.

- Transport

Concerns sea lines or pipelines between sites.

- Drilling

Concerns equipment located on a rig or drilling platform which Maintenance & Inspection is performed by the Maintenance & Inspection team.

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4.4 Level 3: System

The System is a set of unit handling a process or utility function mainly on a particular product/fluid (oil processing, water injection, electrical power, etc.).

The respect of the system break down is mandatory as it is used for accounting reporting on maintenance and inspection activities.

The list with description of the standard Systems is found in **Appendix 1**.

Remark: To avoid any confusion for equipment handling several fluids for the assignment to a system, it is considered that:

- The selection of the system is always dictated by the main process fluid handled by the equipment concerned e.g.:
 - Oil heater: Production Oil system.
 - Glycol contactor: Gas production system.
- For exchangers the system (fluid) is the one passing through the main stream (i.e. the one to be heated or cooled down)
- For separators:
 - First stage separator: according to the upstream (fluid coming from Oil or Gas wells).
 - Second and third stage separators: system to be selected according to the main flux (generally Oil).

Besides the concept of "system fluid" it has been created a system "Common Facilities" to gather all Units which have no process functions such as Lifting, HVAC, Structures, etc.

4.5 Level 4: Unit

The Unit is a set of equipment handling the same main fluid and/or dedicated to a specific process function. The term of process function shall be considered in its large meaning (e.g. the process functions of the Electricity system are power generation, power distribution, lighting).

In case of ambiguity to assign a unit to a system one should ask the question: If the unit is shut down, which system is affected? The unit will belong to the main affected system.

A Unit is a portion of installation that has a maximum of operational autonomy. It is also an entity that could be commissioned.

Detail description:

The description of the units is given in **Appendix 2**.

A list of units by system is found in **Appendix 3**.

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4.6 Level 5: Tag

The Tag represents a unique functional identification within a Company whose maintenance and inspection history and costs are to be retained.

A tag is created according to the following rules:

- It can be broken down into a set of more detailed tags defined at the lower "description level".
- All components of the installation must belong to just one tag at one description level (Only one "parent tag").
- Any item subject to maintenance, inspection or certification must be tagged (pumps, vessels, lifting, PSV, etc.).

Tags are defined mainly during the engineering phase according to the rules fixed within **GS EP EXP 501**. It is the identification of any item as designated on project documents (PID's, etc).

For some Items (piping, structure, electrical, common part of instrumentation system, etc), a specific Tag for a group of equipment may be issued by the Maintenance and Inspection engineering.

In general, the tags are built using the platform identification, the type of equipment and the function number separated by dashes. Example: 10-KB-301.

4.6.1 Complex items

For a complex item, a main tag can be broken down in sub tags. For instance:

- A complete pump can be broken down into the driving machine (motor) and the driven machine (pump).
- Break down to reflect FAME+ structure. This is the case for multipart vessels (e.g. V101-Water phase, V101-Oil phase...); tubular heat exchangers, plate exchangers etc. due to different corrosion problems from one liquid phase to another.

The number of break down levels including the main tag should not exceed 4.

If possible, the sub-tags should repeat the parent tag. Example:

SITE/FPSOA/CRS/HVAC/KX9019A and SITE/FPSOA/CRS/HVAC/KX9019A-ELEC-DRAWER

4.6.2 Turbine driven rotating equipment

This part covers the following Critical Machines functions' relevant of the different technologies:

- Turbo-generator.
- Turbo-compressor.
- Turbo-pump.

The functional breakdown is divided into an obligatory description and recommended description.

The ordering of the breakdown is obligatory or recommended as well.

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The different models of breakdown are detailed in **Appendix 5**.

4.6.3 Pipelines and piping

A pipeline is considered as a functional location, and thus it should have a tag.

For piping, Tags used in the CMIMS are corresponding to the Groups of Piping that are defined prior any FAME+ assessment; grouping is made according to the rules that are described into the user manual "FAME+ Implementation Guidance", where the numbering scheme (TAG) for Groups of Piping is defined. In addition, it is recommended that the individual lines are described as sub-Tags into the pyramid; this is to have the list of lines (Asset register) within the CMIMS.

Official tags (PID, etc) will be used if existing.

4.6.4 Piping accessories

Manual or motorised valves will be described in functional locations when necessary, and will then be tagged.

The criteria of presence in the breakdown is the use for maintenance interventions follow up (creation of work order and planning, preventive and/or inspection plan), cost follow up (man-hours, spare parts), or history follow-up.

4.6.5 Manual valve tagging

A manual valve spare strategy should be in place allowing the Maintenance team to make the correct decisions during the Operational phase of the Asset. The manual valve spare strategy falls into 2 categories; manual valves tagged on a main Functional Location, or grouped at a generic level "Generic HV". The criteria for deciding which option is best suited are based on a number of factors (criticality, cost, lead time delivery, size and uniqueness)

For manual valves not tagged, Contractor shall affect to them a sufficient definition/description (with information on system, units, piping number, etc.) to be able to locate quickly the valves on the Process. These valves can be added in the "Generic HV" Level.

Manual valves belonging to main equipments or packages (battery limits clearly defined) shall be attached to these main equipments or package.

Manual valves installed on the process, not located in the battery limit of main equipment or packages, shall be attached to the SYSTEM / UNIT.

Examples are given in **Appendix 4**.

4.6.6 Remark for Instrumentation

Instrumentation is included in the CMIMS.

Loops (INLP) are included for referencing Work order on Tag. All loops are included into the database.

The Tag of the loop will fit the format described in the **GS EP INS 102**, and is generally issued from the Instrument list.