

GENERAL SPECIFICATION

Field Operations

GS EP EXP 131

Design and installation of Process Data Server

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1. Scope

This specification defines the mandatory requirements for the design, configuration and installation of Process Data Server (PDS) at Total E&P Affiliates. It shall be applied each time a project includes ICSS installation or upgrade with data acquisition by the PDS.

This specification applies to any equipment part of a PDS (servers, data acquisition nodes, data replication nodes, etc.). The PDS components are split between Industrial Information System (SII) and Enterprise Information System (SIE).

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 INS 102	Instrumentation identification
GS EP INS 110	Instrumentation for package units
GS EP INS 135	Cyber Security requirements for design and supply of ICSS and Package Systems
GS EP SPS 019	Subsea production control systems

3. Glossary

AD	Active Directory
CPU	Central Processing Unit
DMZ	Demilitarized Zone
DRP	Disaster Recovery Procedure
ESD	Emergency ShutDown
FPSO	Floating Production Storage and Offloading unit
Gb	Giga-byte
GPS	Global Positioning System
ICSS	Integrated Control and Safety System
OPC	OLE for Process Control
I/O	Input/Output
IP	Internet Protocol
IRIG	Inter-Range Instrumentation Group
IST	Information System Telecom
LIMS	Laboratory Information Management System
Mbps	Mega-bit per second
MOV	Motor Operated Valve
NTP	Network Time Protocol
OS	Operating System
PDCS	Power Distribution Control System
PDS	Process Data Server
PI	Plant Information
PLC	Programmable Logic Controller
QoS	Quality of Service
SCADA	Supervisory Control And Data Acquisition
SIE	Enterprise Information System (French: Système Informatique Entreprise)
SII	Industrial Information System (French: Système Informatique Industriel)
SOE	Sequence Of Events
SSO	Single Sign-On
TCP	Transmission Control Protocol
TEP	Total Exploration Production
VSAT	Very Small Aperture Terminal
OFMS	Overall Flow Metering System

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4. Architecture philosophy

4.1 Introduction

Production monitoring and optimisation of operations are mandatory to guarantee Total E&P performances. Today a real time database (or PDS as Process Data System) collecting all measurements, status and events from production sites is a central tool for this purpose.

This specification will describe the architecture and components to ensure availability and reliability of such a system.

4.2 General principles

The general principles for the implementation of a PDS at TEP Affiliate are the following:

- One PDS server shall be installed at TEP Affiliate premises.
- The PDS Server shall be based on PI (software from OSIsoft) software.
- The production site(s) infrastructure is made of:
 - One or several Data Acquisition nodes:
 - . For ICSS data.
 - . For P3 packages (as defined in [GS EP INS 110](#)).
 - . For P4 packages (as defined in [GS EP INS 110](#)).
 - One optional local PDS server.
 - One optional Data Replication node, for data replication between the local PDS server at production site and TEP Affiliate PDS server in.
- During the Project Phase a complete set of hardware and software with the relevant licences shall be provided for the PI completion and the testing. In case a temporary PI server is needed for a period including the FAT, EXP/OPF will provide a specific license.

Other principles are:

- Data collection shall be achieved using redundant data collection nodes for ICSS data, Subsea data (as per [GS EP SPS 019](#)).
- Data from TEP Affiliate PDS Server shall be replicated to the PDS Server at TEP Headquarters in Pau.
- Data collection from ICSS and P3 packages is mandatory. For P4 packages it is optional when not specified in this document, but highly recommended.

The main objectives are:

- PDS servers shall have 99.5% availability at least.
- Data acquisition shall have 99.9% availability for ICSS data.
- Data acquisition shall have 99.5% availability for other systems (Meteo, Mooring Monitoring System ...).

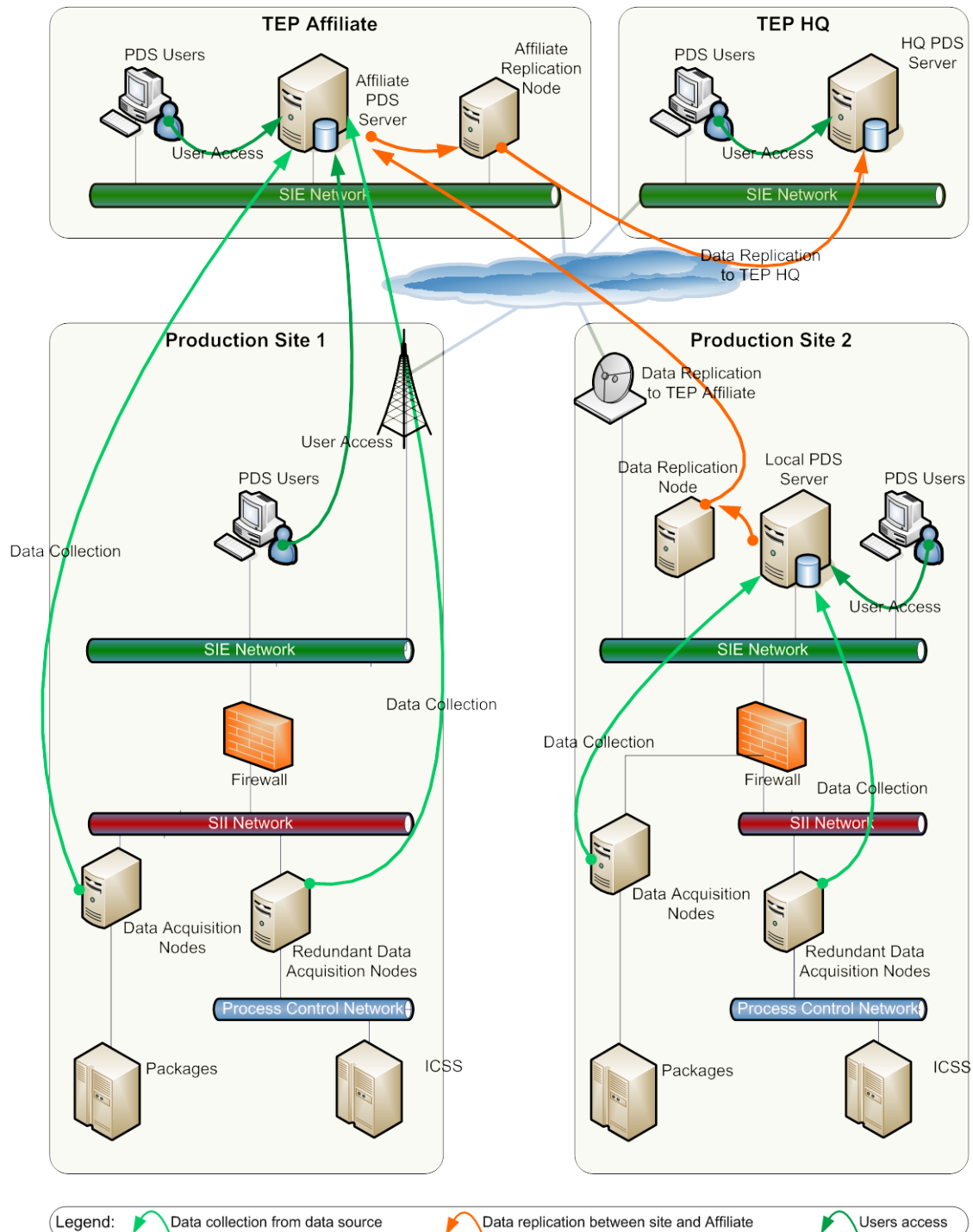
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Those objectives shall be verified using trends of important PDS tags and computations of percentage of good values. For the PDS server itself it shall be based on the tags monitoring the percentage of CPU of the main processes of the software.

4.3 Outline drawing


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4.4 Infrastructure at production site

Two distinct PDS infrastructures are allowed for the production sites as described in outline drawing from chapter "4.3 Outline drawing". The difference lies in whether or not a PDS server is installed locally.

4.4.1 No local PDS server

No local PDS server is installed at the production site. Data is collected from the data sources by the Data Acquisition node(s) and directly transmitted to the PDS server at TEP Affiliate. Both local and Affiliates PDS users are accessing data from the Affiliate PDS server.

This infrastructure shall be applied when the network link between production site and TEP Affiliate is efficient (bandwidth greater than 10 Mbps), reliable (redundant link), or when the number of PDS users at production site is limited (no more than 5). This architecture is also acceptable when local needs can be satisfied by the ICSS historian.

4.4.2 Local PDS server

One local PI server and one Data Replication node can be installed at the production site.

Data is collected from the data sources by the Data Acquisition node(s) and archived in the local PDS server.

Data from the local PDS server is replicated to the PDS server at TEP Affiliate by the Data Replication node.

Local PDS users access data from the local PDS server, while PDS users at TEP Affiliate access data from the PDS server at the Affiliate.

This infrastructure shall be applied when the number of PDS users working at the production site is greater than five and the overall bandwidth of the network between the production site and TEP Affiliate premises is below 10Mbps.

4.5 Infrastructure at TEP Affiliate

The infrastructure at TEP Affiliate shall contain:

- One PDS server that will gather data from all the production sites of the Affiliate.
- One Replication node to transmit data to TEP HQ in France. As this functionality requires very little IT resources it can be installed on mutualised hardware as long as the frequency of computer reboot is lower than one per week.

When the affiliate PDS system is used by more than 50 users or when it is frequently used by operators in control room then it shall be based on redundant PI servers (i.e. PI-HighAvailability).

4.6 Network

PI network communications are using TCP/IP protocol on Ethernet links. A unique TCP/IP port (5450) is dedicated to PI communications.

This chapter describes the requirements relevant to network architecture and performance.

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4.6.1 Network bandwidth

Communications between the production sites and TEP Affiliate premises rely on network links that may use different technologies: microwaves, VSAT, Fiber-Optic, etc.

Network QoS shall give a high priority to PI TCP/IP port (5450) as soon as a link is used for data acquisition or data replication (a continuous real time flow is much better in bandwidth usage and PDS behaviour compared to bursts or batch of data).

4.6.2 Network topology

As a minimum requirement regarding the network, one firewall must be installed and configured to prevent users connected on SIE network to access the equipments on the SII network (ICSS workstations, etc.).

The firewall rules to be configured are described in [GS EP INS 135](#).

4.6.3 Other network aspects

All equipments involved in the PDS system (PDS servers, acquisition and replication nodes, etc. But not the users workstations) must have fixed IP addresses.

Remote access to Data Acquisition nodes located in SII from SIE for maintenance is not allowed. Changes of the configuration of the PI interface running on the acquisition node must be done by a local administrator.

4.7 PDS collector for Packages

The PDS shall be used to collect data from P3 packages and some P4 packages. These Packages may be the Overall Flow Monitoring System, Pipeline Monitoring System, MetOcean Monitoring System, Tank Gauging System, Ballast Monitoring, Marine Monitoring System, Mooring Monitoring System, Fatigue Monitoring System, Vessel Motion Monitoring System, Vessel Dynamic Positioning Monitoring System, Tendon Tension Monitoring System, Riser Monitoring System, Bio Diversity Monitoring System...

All these Packages shall be identified during the pre-project phase and clearly stated in the Statement Of Requirement.

During the Basic Engineering / Front End Engineering Design an architectural drawing shall be issued based on the requirement of this specification.

The quantity of Data Acquisition nodes shall be minimized in order to take into account the Obsolescence effects. For this Virtualisation Principle can be used.

During the Basic Engineering / Front End Engineering Design Contractor shall clearly state in the relevant Package Specifications the requirement for Hardware and Software design and supply.

During the Basic Engineering / Front End Engineering Design Contractor shall prepare a PDS Specification which defines the split of work and supply between all Parties involved e.g. ICSS Suppliers, Packages Suppliers, PDS software Vendor for having consistency during the design, the supply and the testing phases.

This PDS Specification shall also state the responsibility of each Party and shall define an Integrator for the Overall solution.

5. Data Acquisition nodes

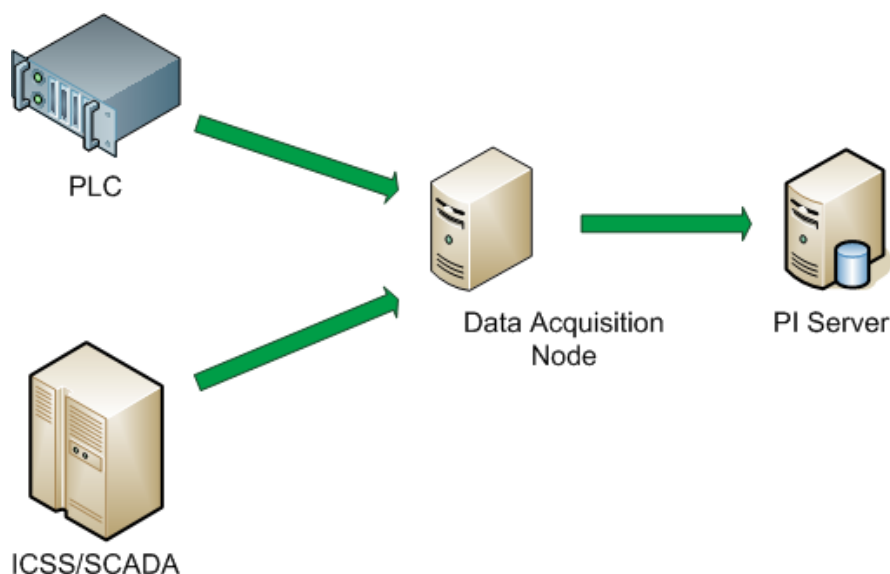
Data Acquisition nodes are used to collect data from one or several data sources:

- Systems connected to SII: ICSS, P3 type packages PLC, etc.
- P4 type data sources: PDCS, SOE, weather station, FPSO mooring and tensioning system, etc.
- SIE data sources: LIMS, OFMS, relational databases (Oracle, SQL Server), etc.

One Data Acquisition node can host several PI Interfaces, depending on SII network architecture and performance of the node. An interface node shall never host interfaces to more than one type of source (ICSS, P3 or P4 packages).

If several systems have the same characteristics regarding cyber security rules then one interface node shall host the corresponding data acquisition softwares whenever possible.

Unless specific recommendations from system vendor or hardware limitations the interface node shall use standard protocols for data acquisition: OPC, modbus, NMEA.



The ICSS shall not be used as a gateway to collect data from packages. In case information from these systems is not already available in the ICSS, it must be acquired directly using a dedicated PI interface as long as the corresponding data is not needed on operator control stations. Details on interfacing packages are given in [GS EP INS 110](#).

Data Acquisition nodes are usually running:

- One software provided by the data source Vendor, in charge of low level communication with the hardware and collecting data from the relevant data source.
- One standard OSIsoft PI interface software, to manage data transmission to the PI server.

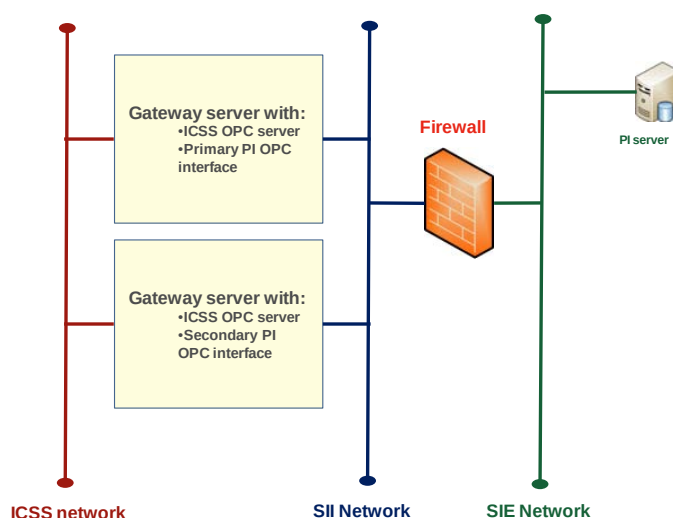
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For the ICSS the data acquisition nodes shall be redundant and dedicated to the ICSS. Whenever possible they shall be installed on hardware provided by the ICSS vendor. For instance in case of OPC connectivity the architecture shall be:



In case the data acquisition node is connected to the SIE the corresponding server (hardware and operating system) shall be provided by Total.

5.1 Data Acquisition Redundancy

Redundancy of data collection, also known as "failover" mechanism, is provided by most PI interfaces.

Two kinds of handshake between the two redundant acquisition nodes (primary and backup) can be used. They are described in OSIsoft documentation as Phase 1 and Phase 2:

- For failover Phase 1, a set of tags used for handshake between primary and backup interfaces must be created in the data source (e.g. in the ICSS).
- For failover Phase 2, a shared file is used for the handshaking, without any impact on the data source.

Except for PI interfaces not allowing failover, this functionality shall be configured for ICSS data acquisition. For other systems not hosting important data for production redundancy is recommended but not mandatory.

Whenever allowed by the PI interface, Phase 2 failover shall be applied and the shared file can be installed on one of the two data acquisition nodes to avoid additional computer.

In addition, "disconnected startup" of the PI Interface shall be used when available. This feature allows starting the data acquisition even if the PDS server is not reachable. In such case data will be stored in a local buffer (see hereunder) waiting for PDS server reconnection.

A test of the failover mechanism shall be rolled out at least once a year. During this test the switch of data acquisition from primary to secondary node is checked. The procedures for redundancy tests shall be provided as part of the PDS documentation and procedures.

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5.2 Buffering Mechanism

PI interfaces include a Buffering mechanism to avoid data loss in case of communication problem between the data acquisition node and the receiving PI server (network issue, PI server stopped for maintenance, etc.).

The Buffering mechanism must be installed and configured on the data acquisition node.

The size of the buffer must allow a 48-hour disconnection with the PDS. OSIsoft sizing tools can be used to calculate this figure.

A test of this buffering mechanism must be rolled out at least once a year. During this test the gateway is disconnected from the PDS server and the data acquisition must go on. At end of the test when the gateway is connected to the PDS server one must verify that no data loss has occurred. The procedures for buffering tests shall be provided as part of the PDS documentation and procedures.

5.3 Configuration of the PI Interface

The configuration of the PI interface must take care of the following:

- Explicit PointSource.
- Optimized scan classes.
- Use of IORate tags to monitor the data acquisition.

5.3.1 Explicit PointSource

The PointSource parameter, identifying the PI interface is no more limited to one character. It shall explicitly refer to the corresponding data source.

The PointSource parameter must be defined as:

- A prefix identifying the production site (e.g. "DAL_", "GIR_", etc.). This prefix shall be the same used for PI tags naming. It shall have a size of 3 to 6 characters.
- A functional identification of the data source (e.g. "ICSS", "LIMS", "MetOcean", etc.)

Examples:

- DAL_MetOcean for Meteo data acquisition on Dalia.
- PAZ_EXA_OPC for Yokogawa Exa_OPC gateway on Pazflor.

Note: the prefix used for PointSource must be similar to the prefix used for the tags naming (see chapter "11.2 Tags naming rules").

5.3.2 Optimized scan classes

The offsets of each scan class shall be defined to avoid several scan classes to be triggered at the same second, even if one of them is scheduled rarely.

5.3.3 Use of I/O Rate tags

PI interfaces can update an "I/O Rate" tag if proper configuration is applied. This tag records the throughput of an interface expressed in events per minute. In particular, the value of an I/O Rate

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point represents a 10-minute average of the total number of values per minute that the Interface sends to the PI Server.

The I/O Rate tag shall be defined and tuned in order to have a compression not higher than 1 event/minute and the step parameter set 'ON' (no data interpolation between two values). It shall be used to monitor the performance, reliability and availability of the data collection.

5.4 Data Acquisition throughput

The data throughput of the acquisition infrastructure shall ensure at least 2000 events read per second for each block of 10,000 PI tags. For instance it means that for 20,000 tags a throughput of 4,000 events per second is required. If this is not possible on a single interface due to software or hardware limitations then one shall split data acquisition on several gateways/interfaces.

5.5 Data acquisition nodes for packages:

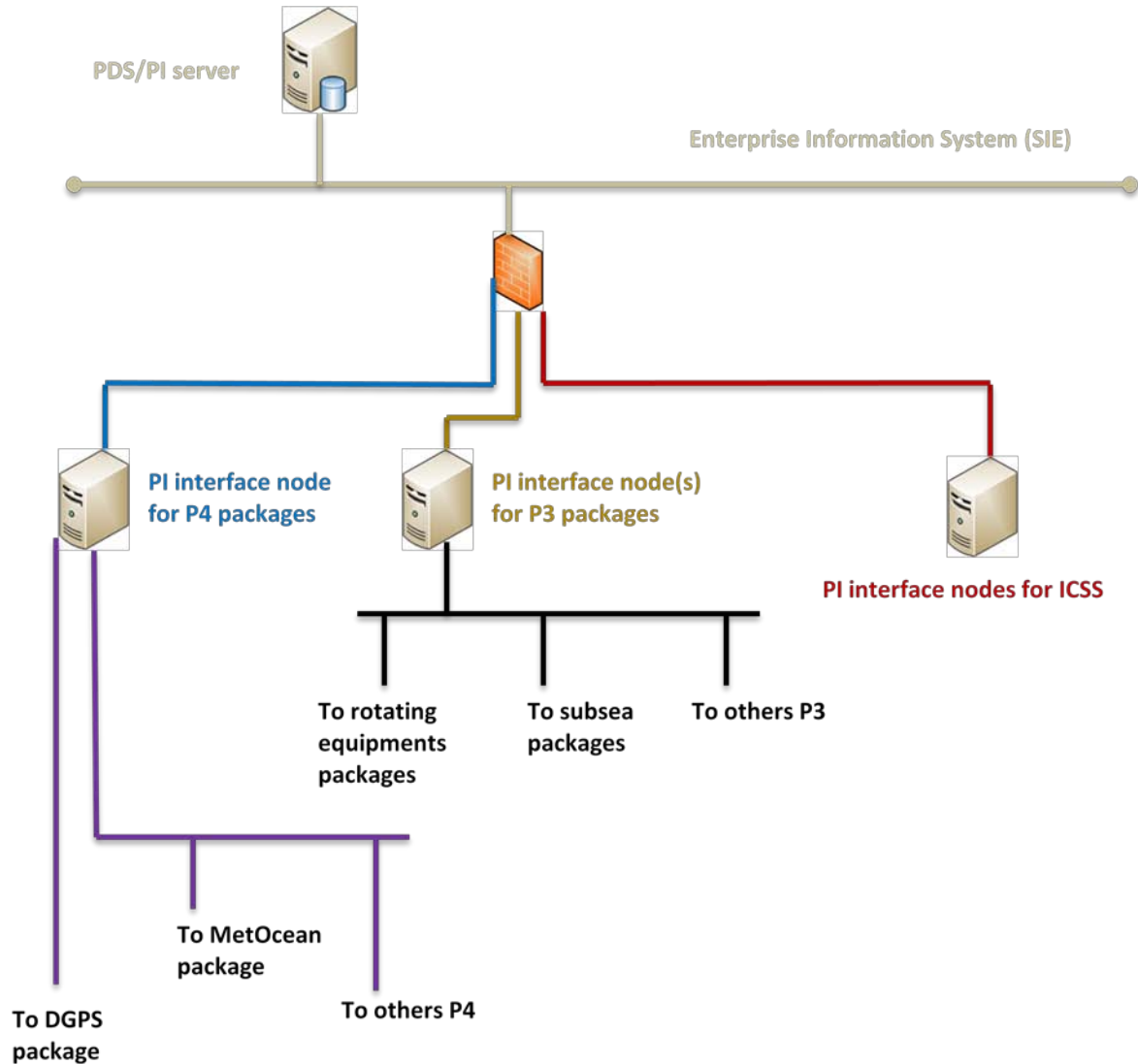
Specifications in **GS EP INS 110** shall be applied for data transfer from packages to PI. Not all packages have to be linked to PI but at least for the following ones data acquisition shall be installed:

- For P3 packages:
 - When we have subsea operations Subsea Control System as per **GS EP SPS 019**.
 - Rotating equipments.
- For P4 packages:
 - GPS or DGPS system if the corresponding site is a floating unit (FSO, FPSO,...).
 - Meteo system (and Oceano system if relevant). Appendix 1 contains specifications for tags to be acquired and their corresponding naming.

One interface node can share data acquisition for several packages of same type (as per **GS EP INS 110**). It is not allowed to use a single interface node to host data acquisition interfaces to both P3 and P4 packages as this may lead to cyber security threat. In the same way the network from interface node to PI server cannot be shared between P3 and P4 system: a dedicated port on firewall shall be used for an interface node collecting data from P4 packages.

The network between interface nodes and packages shall be separated from those between interface nodes and firewall.

Example of an allowed architecture:



6. Local PDS Server

As mentioned in the general principles, the PDS architecture at a production site may include a local PDS Server, depending on the performance and reliability of the network link between the production site and the Affiliate premises.

The specifications and functionalities of the local PDS Server are similar to the one for the Affiliate PDS Server except that an offshore PI server shall never be redundant unless agreement from PI support team (EXP/OPF). Refer to the corresponding chapters.

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7. Data Replication node

A Data Replication node shall be installed at a production site when a local PDS server is available.

The goal of the Data Replication node is to transfer real-time data from the local PDS Server to the PDS server installed at TEP Affiliate.

All the tags from the local PDS Server are replicated, except PI standard test tags and tags that could impact network performance (e.g. SOE through VSAT link).

The Data Replication node hosts an OSIsoft PI-to-PI Interface. As the IT resources needed for this replication is very low it is not mandatory to install a dedicated application server: it can be shared with other software.

The specifications for PItoPI configuration on this computer shall be:

- Specific PItoPI instances for continuous tags (analog measurements). Those interfaces will replicate data without compression and without taking into account the snapshot value (as the current value may be compressed). One PItoPI instance shall manage no more than 2000 tags (this value may be lower on VSAT links).
- Dedicated PItoPI instances for digital tags, string tags and tags changing rarely (like setpoints). Those interfaces shall replicate data with compression and including snapshot values.

8. Affiliate PDS Server

The server used as the Affiliate PDS server shall be a computer complying with TEP requirements for servers. It is connected to SIE network.

The server hosts OSIsoft PI Server software only, installation of other applicative software is strictly forbidden.

Hardware and software for this PDS server shall be provided by Total.

Software packages shall be installed and configured according to the Total\EP\FEI\SI documents.

8.1 Hardware requirements

In addition to TEP requirements regarding Vision servers, the Affiliate PDS server shall have at least the following characteristics:

- CPU: four cores for each 10,000 tags in PI database (can be limited to a maximum of 16 cores).
- Memory: 4 Gb of RAM for each 10,000 tags (can be limited to a maximum of 16 Gb).
- For the storage subsystem, as the need for IOs can be very high, an approval from Total/EP/FEI/SI/APG shall be obtained.

8.2 Software requirements

In addition to Total EP/FEI/SI requirements regarding servers, the Affiliate PDS server shall use the following software:

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- Requirements in documents specified by Total/EP/FEI/SI for PI installation and configuration.
- PI software version validated by EXP/OPF.

It is not allowed to install other software than PI server and PI management console on a PDS server, even PI client software. The main reasons are:

- Compatibility of basic components (PI communication layer version).
- Ability of the PI server to evolve later to PI-HA (High Availability PI server distributed on several nodes).
- Complexity of PI server administration and monitoring.

8.3 Disks configuration

Partitioning of the hard disk space must be done as follows:

OS Logical Drive	Role
C:	Windows Operating System
E:	PI Daily Backups PI setup packages
D:	PI Server software PI Data

As for D: drive the IO throughput may be very high the approval of architecture mentioned in §8.1 is not an option. Some PDS servers have suffered lack of reliability due to weak hardware.

8.4 PI Server software configuration

PI Server software setup shall be done according to the procedures from FEI/SI.

The following points must be taken into account:

- PI default tags (sinusoid, cdt158, etc.) shall be configured as they are useful for troubleshooting the PI server and installation verification.
- Size of PI archives shall be set to ensure that a PI archive shift will not occur more than once every 4 days.
- Automatic creation of PI Archives on archive shift shall be configured.
- Procedures to fully reinstall the PI server from full and online backups shall be provided in PDS documentation.
- High Availability features of the PI Server software shall be used in case PDS data is massively used by production site personnel when the production site has no local PDS server (e.g. Operators in Control room). In this case, PI Server software is installed on at least two servers grouped as a "PI Collective" in affiliate headquarter.

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9. Affiliate Replication node

The goal of the Affiliate Replication node is to transfer data from the Affiliate PDS Server to a PDS Server in TEP Headquarters in France.

The list of the tags to be replicated is issued by TEP HQ following requests from "Metier" people (Reservoir, Maintenance, etc.).

The Data Replication node hosts OSIsoft PI-to-PI Interfaces. As the hardware and resources requirements for this function is very low the corresponding server can host others applications.

Recommendations and requirements defined for Data Replication nodes at production site are applicable to the Affiliate Replication node.

10. PDS Clients

PDS users may be located at production site or at the Affiliate premises.

PDS users are using standard Total E&P computer on which PI Client software tools (PI-ProcessBook and PI-DataLink) are installed.

PI software installation shall be done using Total E&P procedures (remote installation of packages).

PDS users located in a production site shall access data from the Affiliate PDS Server except when a PDS Server is available locally. When site user needs data from several sites and when the network to base is slow then:

- The needed data from other sites shall be replicated locally (from base to site) if more than 5 users are involved in this sharing.
- In other cases (less than 5 users) the users shall be granted rights to access base PI server.

11. Configuration of PI Database

11.1 Tag types

The following minimal information shall be archived in the PDS server:

- All process measurements (such as temperature, flow rate, pressure, etc.) available in ICSS.
- For controllers: setpoint, output and optionally state parameters (Auto/Manu, Local/Remote, etc.). In case of important controllers those parameters shall be recorded (advanced process control like FCW for instance).
- Status (On/Off, Running/Stopped, etc.) of main equipments such as motors, turbines, MOV, etc.
- Optionally Alarms & Events, SOE string tags (Sequence Of Events).

Other systems (MetOcean, mooring recording, Riser monitoring,...) shall be connected to a PI-interface to capture data. This data acquisition shall not be done via the ICSS unless the corresponding data is used for control or operators mimic.

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Data mentioned above is sent from the production sites by the Data Acquisition nodes or Data Replication nodes.

11.2 Tags naming rules

The tag names used in the PI database shall allow unambiguous identification of the data: relevant production site, information in the data source (ICSS, SCADA, etc.) and type of the data (collected, calculated, reconciled, etc.)

The tag naming is intended to be logically applied such that the research with the PI tools ("*", "?") is optimized. The code structure is composed of three parts:

Prefix	Middle Name	Suffix
--------	-------------	--------

Prefix

The prefix is corresponding to the site identification (e.g. "DAL" for Dalia, "PAZ" for Pazflor, etc.) followed by a separator ("_").

A "site" is a set of systems located in a single (same) location and including multiple process or utility systems. The site identification is a short text associated to the site (from 3 to 6 letters).

Middle Name

The middle name is identifying the measurement, calculation, manual input, etc. corresponding to the tag. The middle name must be chosen as far as possible according to **GS EP INS 102**.

For tags collected from the ICSS, the middle name must be mapped with the ICSS tag name (e.g. 12TI1234, 64FV1004, etc.).

Suffix

The suffix identifies the type of data. It depends on the data source for the tag (ICSS, manual input, data reconciliation system, LIMS, etc.) and must be fixed according to the following table:

Type of data	Suffix	Comments/Examples
Measure	.	instrument or controller measurement (Process Value) from ICSS, SCADA, etc.
Set point	.spt	controller setpoint
Output	.out	controller output value
Auto/Manu	.am	controller status
Local/Remote	.lr	controller mode
Calculated	.comp	
Simulated	.sim	
Cleansed	.Cln	
Reconciled	.rec	

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LIMS		No suffix
Manual logging	.mi	

This suffix is intended to have the same tag naming in affiliate headquarter even if we have several sites with different ICSS providers. For instance if a measure on ICSSA is FC3001.MEAS and another on ICSSB is FC3022.PV then we shall have tags named 'STA_FC3001.' and 'STB_FC3022.'.

Manual data logging:

The code structure of the "middle name" for the manual data logging shall be as much as possible based on the **GS EP INS 102** with a three field's name.

Code structure:

1st field: Plant or construction (up to four alphanumeric characters). (**GS EP INS 102**).

2nd field: Function or instrument (up to eight alphanumeric characters).

The 2nd field shall be partially based on the **GS EP INS 102**. Remaining the specifications, the 2nd field follows the same rules and the 2nd letter function by default which is defined as M, like manual.

3rd field: Description.

The 3rd field describes the tag with information, from the general point of view to the specific. They are separated by "_".

Note: The following characters shall not to be used for PI tag naming: "-", " ", ".", "!", "?", "*".

Examples:

Prefix	1st field	2 nd field	3rd field	Suffix	Full tag name
GIR_	38	PM	_TE308_FUEL_GAS	.mi	GIR_38PM_TE308_FUEL_GAS.mi
DAL_	62	TM	_V291_OUTPUT	.mi	DAL_62TM_V291_OUTPUT.mi

Calculation, simulation, cleansing, reconciliation

The code structure of the "middle name" for the calculated, simulated, cleansed, reconciliated data shall be based on the **GS EP INS 102** with a three field's name, when it refers to an existing data in the ICSS.

1st field: Plant or construction (up to four alphanumeric characters).

2nd field: Function or instrument (up to eight alphanumeric characters).

3rd field: Instrument loop and extension loop serial number (up to eight alphanumeric characters).

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- These specifications are mandatory if available. Indeed there shall be no difference of tag naming between the PI system and the ICSS. In the case of an exception to the **GS EP INS 102**, one shall use the full tag name in the ICSS, as the “Middle name”.
- In case of several computation values on the same object, one shall precise extra information on the calculation process at the end of the 3rd field, separated by “_”. For instance: interpolation (INTERP), statistic neural network (NEURAL).

Examples:

Prefix	1 st field	2 nd field	3 rd field	Suffix	Full tag name
GIR_	64	FV	1004	.cln	GIR_64FV1004.cln
DAL_	64	LT	A1030	.calc	DAL_64LT1030.calc
DAL_	63	TW	6030_INTERP	.calc	DAL_63TW6030_INTERP.calc
DAL_	63	TW	6030_NEURAL	.calc	DAL_63TW6030_NEURAL.calc

If calculated, simulated, cleansed, reconciled data doesn't refer to an existing data in the ICSS, the code structure shall be based on the **GS EP INS 102** with a three field's name.

Code structure:

1st field: Plant or construction (up to four alphanumeric characters) (**GS EP INS 102**).

2nd field: Function or instrument (up to eight alphanumeric characters) (**GS EP INS 102**).

3rd field: Description.

The 3rd field describes the tag with from the general point of view to the specific. They are shared by “_”.

Additionally:

- The following characters shall not to be used for PI tag naming: “-“, “ “, “.”, “!”, “?”, “*“.
- In case of several computation values on the same object, one shall precise extra information on the calculation process at the end of the 3rd field, separated by “_”. For instance: interpolation (INTERP), statistic neural network (NEURAL).

Examples:

Prefix	1 st field	2 nd field	3 rd field	Suffix	Full tag name
DAL_	32	LT	_V291_OUTPUT	.rec	DAL_32TY_V291_OUTPUT.rec
GIR_	62	LP	_TE308_FUEL_GAS_INTERP	.calc	GIR_62PY_TE308_FUEL_GAS_INTERP.calc
GIR_	62	LP	_TE308_FUEL_GAS_NEURAL	.calc	GIR_62PY_TE308_FUEL_GAS_NEURAL.calc

LIMS

The code structure of the “middle name” for laboratory results shall be as much as possible based on **GS EP INS 102**.

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Code structure:

1st field: Plant or construction (up to four alphanumeric characters) (**GS EP INS 102**).

2nd field: Function or instrument (up to eight alphanumeric characters).

The 2nd field shall be partially based on the **GS EP INS 102**. Remaining the specifications, the 2nd field follows the same rules. The first two letters shall be A and M, as analyze and manual.

3rd field: Description.

The 3rd field describes the tag with information from the general point of view to the specific. They are shared by “_”.

Note:

- The following characters shall not be used: “-“, “ “, “.”, “!“, “?”, “*“.
- The LIMS data are not considered as measure as they don't come from the ICSS, the suffix shall be blank.

Examples:

Prefix	1 st field	2 nd field	3 rd field	Suffix	Full tag name
GIR_		AM	TE308_ FUELGAS_ C4		GIR_ AM _TE308_ FUELGAS_ C4
DAL_		AM	_B301_OUT_DENSITY		DAL_ AM _B301_OUT_DENSITY

Some naming examples

Tag Type	Site	Tag name in datasource	PDS Full tag name	Description
Process Value	Dalia	64LT/A1030	DAL_64LT/A1030.	Process Value of Level Transmitter on loop 1030 from unit 64 on Dalia FPSO
Setpoint	Girassol	32FC3001	GIR_32FC3001.spt	Setpoint of a Flow controller on loop 3001 from unit 32 on Girassol FPSO
Status	AKPO	2PMV300411A	OML130_2PMV300411A.	Status of Production Master Valve 300411A in unit 2 on AKPO FPSO
Manual Input	Dalia	Not Applicable	DAL_62TM_V291_INPUT.mi	Manual input of temperature at inlet of vessel V291 from unit 62 on Dalia FPSO
Calculation	Girassol	62LP_TE308_FUEL_GAS	GIR_62PY_TE308_FUEL_GAS_INTER P.calc	Interpolated calculated value of the Fuel Gas pressure on equipment TE308 from unit 62 on Girassol FPSO
Reconciled value	Dalia	32LT_V291_OUTPUT	DAL_32TY_V291_OUTPUT.rec	Reconciled value of the tag "32LT_V291_OUTPUT" corresponding to Temperature at outlet of Vessel V291 from unit 32 on Dalia FPSO
Laboratory	Dalia	Not Applicable	DAL_ AM_B301_OUT_DENSITY	Density result received from

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result				Dalia Laboratory for a sample taken at sample point B301- Output on Dalia FPSO
Alarm	Dalia	30LAHH3052	DAL_30LAHH3052.	Alarm on high high level measured on instrument 30LT3052

11.3 Digital States naming

Some tags named as 'Digital tags' store integer values that are indexes to a list of enumerated values. This list is named 'Digital Set' and the configuration of tags includes the name of this set.

Naming and configuration of the Digital States are key parameters especially within the context of multiple replications PI database in a central PI server.

The Digital Set name must be defined as:

- A prefix identifying the production site (e.g. "DAL_", "GIR_", etc.); it must be similar to the prefix used for the tags naming (see chapter "11.2 Tags naming rules").
- A functional identification of the Digital Set (e.g. "VALVE_STATUS", "ESD", "MOTOR_STATUS", etc.).

To ease the usage, understanding of data and development of tools, it is mandatory to respect the following rules:

- The labels used for the digital states:
 - Use only English vocabulary.
 - Use only capital letter for first letter.
 - Avoid blank character. Use underscore in place (Ramp_Up for instance).
- Whenever possible, the labels should be selected from the following standard list:
 - Valve status: Opened, Closed, Opening, Closing, Moving, Discordant, Undetermined.
 - Equipment status (e.g. motor, pump, fan): On, Off, Run, Stop.
 - Controller status: Manual, Auto, Local, Remote.
 - Alarms: Normal, Alarm.

Others: Left, Right, Up, Down, Shutdown, MeOH_Flushing.

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Appendix 1 METOCEAN tags

Those tags are used also in a corporate database (MODAnet system managed by EP/DEV/TEC/GEO). The naming rules hereunder shall be applied strictly unless EP/DEV/TEC/GEO agreement.

PI tags should contain site name in prefix, Metocean to mark its affiliation to metocean data, the physical type (directions, distance ...), type of information (data, analysis ...), its location and its parameter name.

Here is an example:

DAL_Metocean_SI_TOWER_Wind:

- **DAL** is the PI prefix for Dalia.
- **S** means it is a velocity.
- **I** means it is a measure from an instrument.
- **Tower** means the instrument is localised on the Telecom tower.
- **Wind** means it is a measure of wind velocity.

Remarks:

At this moment, only 4 locations have been used: Helideck, Tower for the Telecom tower, MainDeck and buoy when there is an ocean buoy. If a new location needs to be added, the corresponding naming shall be obtained from EP/DEV/TEC/GEO..

For PI configuration, each parameter shall be associated with 4 metadata displayed in the table below:

- The PI tag described as "Tag" which standardizes the name of the parameter in PI allowing it to be found easily.
- The "Resolution".
- The "descriptor" which gives a summarized description of the parameter.
- The parameter unit described as "engineering units".
- The "Possible location" is position where the parameter can be measured

Here is the list of the metocean parameters:

Tag	Resolution	Descriptor	Engineering units	Possible location
XXX_Metocean_AI_[Location]_Humidity	0,1	relative humidity	%	Helideck, Tower
XXX_Metocean_AI_[Location]_Visibility	50	horizontal visibility	m	Helideck, Tower
XXX_Metocean_KI_[Location]_WvPeak	0,1	peak wave period	s	Buoy, MainDeck, Helideck, Tower
XXX_Metocean_KI_[Location]_WvT	0,1	zero-upcrossing wave period	S	Buoy, MainDeck, Helideck, Tower

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XXX_Metocean_LI_[Location]_Cloud1	10	cloud height base 1	M	Helideck, Tower
XXX_Metocean_LI_[Location]_Cloud2	10	cloud height base 2	M	Helideck, Tower
XXX_Metocean_LI_[Location]_Cloud3	10	cloud height base 3	M	Helideck, Tower
XXX_Metocean_LI_[Location]_CloudCoverage	0,1	cloud coverage	Oktas	Helideck, Tower
XXX_Metocean_LI_[Location]_CrestH	0,1	wave height measured from mean sea level to crest	M	Buoy, MainDeck, Helideck, Tower
XXX_Metocean_LI_[Location]_Depth	0,1	Water column above ADCP	M	Buoy, MainDeck
XXX_Metocean_LI_[Location]_MaxWvHeight	0,2	maximum wave height	M	Buoy, MainDeck, Helideck, Tower
XXX_Metocean_LI_[Location]_Precipitation	0,1	precipitation	Mm	Helideck, Tower
XXX_Metocean_LI_[Location]_SigWvHeight	0,1	significant wave height	M	Buoy, MainDeck, Helideck, Tower
XXX_Metocean_LI_[Location]_Tide	0,1	tide level	M	Buoy, MainDeck, Helideck
XXX_Metocean_NI_[Location]_XCurrDir	0.1	Surface current direction to North from X-Band radar	°	Tower
XXX_Metocean_NI_[Location]_CurrDir	1	Current direction to North from current meter-3m below the surface	°	Buoy, MainDeck,
XXX_Metocean_NI_[Location]_CurrDir1	1	current direction to North from bin1 of the current profiler – 3m below surface	°	Buoy, MainDeck
XXX_Metocean_NI_[Location]_CurrDir2	1	current direction to North from bin2 of the current profiler – 5m below surface	°	Buoy, MainDeck
XXX_Metocean_NI_[Location]_CurrDir3	1	current direction to North from bin3 of the current profiler – 10m below surface	°	Buoy, MainDeck
XXX_Metocean_NI_[Location]_CurrDir4	1	current direction to North from bin4 of the current profiler – 15m below surface	°	Buoy, MainDeck
XXX_Metocean_NI_[Location]_CurrDir5	1	current direction to North from bin5 of the current profiler – 20m below surface	°	Buoy, MainDeck
XXX_Metocean_NI_[Location]_CurrDir6	1	current direction to North from bin6 of the current profiler – 25m below surface	°	Buoy, MainDeck

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XXX_Metocean_NI_[Location]_CurrDir7	1	current direction to North from bin7 of the current profiler – 30m below surface	°	Buoy, MainDeck
XXX_Metocean_NI_[Location]_CurrDir8	1	current direction to North from bin8 of the current profiler – 35m below surface	°	Buoy, MainDeck
XXX_Metocean_NI_[Location]_CurrDir9	1	current direction to North from bin9 of the current profiler – 40m below surface	°	Buoy, MainDeck
XXX_Metocean_NI_[Location]_CurrDir10	1	current direction to North from bin10 of the current profiler – 45m below surface	°	Buoy, MainDeck
XXX_Metocean_NI_[Location]_Heading	0,1	FPSO direction to North	°	Buoy, MainDeck, Helideck
XXX_Metocean_NI_[Location]_WindDir	1	wind direction to North	°	Helideck, Tower
XXX_Metocean_NI_[Location]_WvDir	1	mean wave direction to North	°	Helideck, Tower
XXX_Metocean_NI_[Location]_WvPeakDir	5	peak wave direction to North	°	Buoy, MainDeck, Helideck, Tower
XXX_Metocean_PI_[Location]_QFE	0,1	barometric pressure at helideck level (QFE) (hPa)	hPa	Helideck, Tower
XXX_Metocean_PI_[Location]_QNH	0,1	barometric pressure at sea level (QNH) (hPa)	hPa	Helideck, Tower
XXX_Metocean_SI_[Location]_XCurr	0,1	Surface current speed from X-Band radar	m/s	Tower
XXX_Metocean_SI_[Location]_Curr	0,1	Surface current speed from current meter -3m below the surface	m/s	Buoy, MainDeck,
XXX_Metocean_SI_[Location]_Curr1	0,1	current speed from bin1 of the current profiler – 3m below surface	m/s	Buoy, MainDeck
XXX_Metocean_SI_[Location]_Curr2	0,1	current speed from bin2 of the current profiler – 5m below surface	m/s	Buoy, MainDeck
XXX_Metocean_SI_[Location]_Curr3	0,1	current speed from bin3 of the current profiler – 10m below surface	m/s	Buoy, MainDeck

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XXX_Metocean_SI_[Location]_Curr4	0,1	current speed from bin4 of the current profiler – 15m below surface	m/s	Buoy, MainDeck
XXX_Metocean_SI_[Location]_Curr5	0,1	current speed from bin5 of the current profiler – 20m below surface	m/s	Buoy, MainDeck
XXX_Metocean_SI_[Location]_Curr6	0,1	current speed from bin6 of the current profiler – 25m below surface	m/s	Buoy, MainDeck
XXX_Metocean_SI_[Location]_Curr7	0,1	current speed from bin7 of the current profiler – 30m below surface	m/s	Buoy, MainDeck
XXX_Metocean_SI_[Location]_Curr8	0,1	current speed from bin8 of the current profiler – 35m below surface	m/s	Buoy, MainDeck
XXX_Metocean_SI_[Location]_Curr9	0,1	current speed from bin9 of the current profiler – 40m below surface	m/s	Buoy, MainDeck
XXX_Metocean_SI_[Location]_Curr10	0,1	current speed from bin10 of the current profiler – 45m below surface	m/s	Buoy, MainDeck
XXX_Metocean_SI_[Location]_Wind	0,5	wind speed measurement from instrument	m/s	Helideck, Tower
XXX_Metocean_TI_[Location]	0,1	dry air temperature	°C	Helideck, Tower
XXX_Metocean_TI_[Location]_DewPoint	0,1	dew point temperature	°C	Helideck, Tower
XXX_Metocean_TI_[Location]_Sea	0,1	sea water temperature	°C	Buoy, MainDeck, Helideck
XXX_Metocean_TI_[Location]_WetAir	0,1	wet air temperature	°C	Helideck, Tower
XXX_Metocean_TI_[Location]_WindC	0,1	wind chill temperature	°C	Helideck, Tower

This table shall be adapted to match the system:

- XXX must be replaced by the prefix of the platform.
- [Location] must be replaced by helideck, buoy, MainDeck or tower.
- The depth of the ADCP bin should be adapted.
- The number of bin could be extended or reduced.