

## GENERAL SPECIFICATION

### FIELD OPERATIONS

#### GS EP EXP 159

#### Pipeline Management System

|      |         |                                                    |
|------|---------|----------------------------------------------------|
|      |         |                                                    |
|      |         |                                                    |
|      |         |                                                    |
| 02   | 05/2015 | Organisation change – January 2015                 |
| 01   | 11/2013 | Update following the EP reorganisation, march 2011 |
| 00   | 01/2011 | First Release                                      |
| Rev. | Date    | Purpose of the revision                            |

Owning entity: DSO/EXP

Managing entity: DSO/EXP

Document update realised by  
standards coordination  
Reorganisation 2015

## Contents

|                                            |           |
|--------------------------------------------|-----------|
| <b>1. Scope .....</b>                      | <b>4</b>  |
| 1.1 Definitions .....                      | 4         |
| 1.2 Applicability .....                    | 4         |
| 1.3 Purpose .....                          | 4         |
| <b>2. Reference documents .....</b>        | <b>4</b>  |
| <b>3. Glossary .....</b>                   | <b>4</b>  |
| <b>4. Design principles .....</b>          | <b>5</b>  |
| <b>5. Dynamic Model Requirements .....</b> | <b>6</b>  |
| 5.1 Modelling Philosophy .....             | 6         |
| 5.2 Dynamic model scope .....              | 6         |
| 5.3 Inflow function .....                  | 6         |
| 5.4 Thermodynamic package .....            | 7         |
| 5.5 Multiphase flow model .....            | 7         |
| 5.6 Process model .....                    | 8         |
| 5.7 Automation .....                       | 8         |
| 5.8 Accuracy criteria .....                | 8         |
| <b>6. Live mode .....</b>                  | <b>9</b>  |
| 6.1 Interface with RTDB .....              | 10        |
| 6.2 Execution speed .....                  | 10        |
| 6.3 Monitoring .....                       | 10        |
| 6.4 Warnings .....                         | 11        |
| 6.5 Cyclic Snap .....                      | 11        |
| 6.6 Availability .....                     | 11        |
| 6.7 Catch-up mode .....                    | 11        |
| <b>7. Calibration mode .....</b>           | <b>11</b> |
| <b>8. Replay mode .....</b>                | <b>12</b> |
| <b>9. Look-ahead mode .....</b>            | <b>12</b> |

| General Specification      |                         | GS EP EXP 159 |
|----------------------------|-------------------------|---------------|
| Pipeline Management System |                         |               |
| Rev.: 02                   | Effective date: 05/2015 | Page: 3 of 14 |

|                                             |           |
|---------------------------------------------|-----------|
| <b>10. Off-line mode .....</b>              | <b>13</b> |
| <b>11. PMS acceptance workflow .....</b>    | <b>13</b> |
| <b>12. Maintenance .....</b>                | <b>14</b> |
| <b>13. Scope of supply .....</b>            | <b>14</b> |
| 13.1 Software application and licence ..... | 14        |
| 13.2 Hardware .....                         | 14        |
| 13.3 Documentation.....                     | 14        |
| 13.4 Services .....                         | 14        |

| General Specification      |                         | GS EP EXP 159 |
|----------------------------|-------------------------|---------------|
| Pipeline Management System |                         |               |
| Rev.: 02                   | Effective date: 05/2015 | Page: 4 of 14 |

## 1. Scope

### 1.1 Definitions

A Pipeline Management System (PMS) is a software application designed for providing Field Operations personnel with support where production facilities multiphase flow conditions.

### 1.2 Applicability

This document applies to a transportation system carrying hydrocarbon fluids and water under more than one single phase between distant production facilities.

Plant and surface facilities piping are not impacted.

This specification assumes that all sensor measurements, actuators commands and shut down status are retrieved and stored in real time in an historical data base.

### 1.3 Purpose

This specification describes the minimum requirements of a PMS.

## 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 |
|----------------|-------|
| Not applicable |       |

## 3. Glossary

BSW: Basic Sediment Water

CCR: Central Control Room

CGR: Condensate Gas Ratio

ESD: Emergency Shut Down

| General Specification      |                         | GS EP EXP 159 |
|----------------------------|-------------------------|---------------|
| Pipeline Management System |                         |               |
| Rev.: 02                   | Effective date: 05/2015 | Page: 5 of 14 |

FAT: Factory Acceptance Test

GOR: Gas Oil Ratio

HMI: Human Machine Interface

MAT: Model Acceptance Test

MPFM: Multi Phase Flow Meter

OCWR: Overall Control for Wells and Risers

PCS: Process Control System

PSS: Process Safety System

PMS: Pipeline Management System

PVT tables: Thermodynamic tables

RTDB: Real Time Data Base

SAT: Site Acceptance Test

SIE: System Information Enterprise

SII: System Information Industrial

## 4. Design principles

PMS shall belong to the operational entity SIE and shall be disconnected from SII network.

PMS shall pick-up field data in the production field RTDB and may store calculated data in the same RTDB.

PMS may include five modes of operation:

- Live mode: to provide operators with key parameters related to current operation. This is achieved by the synchronisation of PMS with field data (collected from RTDB) in such a way that the embedded PMS dynamic model mirrors the real production operations.
- Calibration mode: an enhanced model calibration mode.
- Replay mode: to re simulate an operational period in the history.
- Look-ahead mode: to provide Field Operations personal with early warning by predicting the short term production facilities trend.
- Off-line mode: to conduct training, perform “what-if” and planning sort of simulations.

The live and calibration modes are mandatory for Field Operations support, and shall be included in any PMS development. In practice, the off-line mode is also always part of the specifications. The two other ones are left optional.

The selected operating modes shall run simultaneously without compromising the speed of each mode.

PMS Human Machine Interface shall be remotely accessible from any authorized workstation connected to the SIE network of the operational entity. The number of simultaneous PMS end-users shall be defined in the project specification.