



APPLICATION DESIGN SPECIFICATION

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Project : Obigbo Flowstation Production Reporting Project

Client : Cle-Parinna International Limited

End User : Shell Petroleum Development Company

	OBIGBO FLOWSTATION PRODUCTION REPORTING PROJECT			AutoDES NG
	APPLICATION DESIGN SPECIFICATION			
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1.0 INTRODUCTION

The production data at Obigbo Flowstation (OBGFS) are currently getting updated in the PCD PI Server system on an intermittent basis. This is perceived to be due to the intermittent outage of telecoms link between the OBGFS PLC and the PI Server. SPDC intends to overcome this challenge by adding an operator workstation with Excel Reporting capabilities to the OBGFS PLC. The operator workstation shall be configured to retrieve and archive production data in Microsoft Excel file format.

1.1. SCOPE OF DOCUMENT

This document elaborates the design of the operator workstation integration and the software configuration that shall be performed to achieve the objectives of the project.

1.2. ABBREVIATIONS

OWS	Operator Workstation
PCD	Process Control Domain
PLC	Programmable Logic Controller

Table 1 : Abbreviations

2.0 OPERATOR WORKSTATION SETUP

2.1. GENERAL SETUP SUMMARY

The operator workstation environment setup shall be carried out as noted in the table below:

Item	Setup Details
Computer Name	OBGFS-OWS
Computer Workgroup	OBGFS
Computer OS & Version	Windows 10 Professional
Operator Interface Software	XLReporter
PLC Integration Software	Keeware OPC Server
Disk Size / [Partitions]	500GB [C: 100GB; D: 400GB]

Table 2 : Operator Workstation Setup Summary

2.2. APPLICATION PATHS

Dedicated folder paths shall be reserved for crucial application files. The reserved folder paths are listed in the table below.

Item	Setup Details
XLReporter Application	D:\XLReporter\
Production Reports	D:\ProductionReports\

Table 3 : Application Folder Paths

The production reports shall be generated and archived in the dedicated folder. The files can thereafter be retrieved or printed, as required, for further analysis.

2.3. USER ACCESS CONTROL

The operator application shall have access control functionality. Different user accounts shall be created, each with limits to the activities that can be performed. The user accounts are listed below:

User Account	Accessible Functions
Administrator	<input checked="" type="checkbox"/> Full access to the application and configuration environments
	<input checked="" type="checkbox"/> Generate Report Templates
	<input checked="" type="checkbox"/> View Production Reports
Supervisor	<input checked="" type="checkbox"/> Full access to the application and configuration environments
	<input checked="" type="checkbox"/> Generate Report Templates
	<input checked="" type="checkbox"/> View Production Reports
Operator	<input checked="" type="checkbox"/> Full access to the application and configuration environments
	<input checked="" type="checkbox"/> Generate Report Templates
	<input checked="" type="checkbox"/> View Production Reports

Table 4 : Application Access Control

2.4. THE HARDWARE INTEGRATION

The connection of the OWS to the PLC shall be as illustrated in the System Architecture drawing - OAG-AS-201903A-SAR.



3.0 PRODUCTION REPORTS

In line with the existing reporting tradition, both oil production and gas production reports shall be generated. The reports shall be automatically retrieved from the PLC and archived on the OWS at 0600hrs on a daily basis. The following sections describe the setup of the report.

3.1. OIL PRODUCTION DATA

The table below lists the oil production data that shall be reported

S/No	Parameter	Description	Unit
1.	ExportMeter1.AverageFlowrateCurrentDay	Export Meter 1 Average Flowrate, Today	bbl/d
2.	ExportMeter1.AverageFlowratePreviousDay	Export Meter 1 Average Flowrate, Yesterday	bbl/d
3.	ExportMeter1.BSWVolumeToday	Export Meter 1 BSW Volume, Today	bbl
4.	ExportMeter1.BSWVolumeYesday	Export Meter 1 BSW Volume, Yesterday	bbl
5.	ExportMeter1.GrossStdVolumeToday	Export Meter 1 Gross Volume Flow, Today	bbl
6.	ExportMeter1.GrossStdVolumeYesday	Export Meter 1 Gross Volume Flow, Yesterday	bbl
7.	ExportMeter1.NetStdVolumeToday	Export Meter 1 Net Oil Volume Flow, Today	bbl
8.	ExportMeter1.NetStdVolumeYesday	Export Meter 1 Net Oil Volume Flow, Yesterday	bbl
9.	ExportMeter2.AverageFlowrateCurrentDay	Export Meter 2 Average Flowrate, Today	bbl/d
10.	ExportMeter2.AverageFlowratePreviousDay	Export Meter 2 Average Flowrate, Yesterday	bbl/d
11.	ExportMeter2.BSWVolumeToday	Export Meter 2 BSW Volume, Today	bbl
12.	ExportMeter2.BSWVolumeYesday	Export Meter 2 BSW Volume, Yesterday	bbl
13.	ExportMeter2.GrossStdVolumeToday	Export Meter 2 Gross Volume Flow, Today	bbl
14.	ExportMeter2.GrossStdVolumeYesday	Export Meter 2 Gross Volume Flow, Yesterday	bbl
15.	ExportMeter2.NetStdVolumeToday	Export Meter 2 Net Oil Volume Flow, Today	bbl
16.	ExportMeter2.NetStdVolumeYesday	Export Meter 2 Net Oil Volume Flow, Yesterday	bbl
17.	PlantExport.BSWVolumeToday	Total Flowstation BSW Volume, Today	bbl
18.	PlantExport.BSWVolumeYesterday	Total Flowstation BSW Volume, Yesterday	bbl
19.	PlantExport.GrossStdVolumeToday	Total Flowstation Gross Volume Flow, Today	bbl
20.	PlantExport.GrossStdVolumeYesterday	Total Flowstation Gross Volume Flow, Yesterday	bbl
21.	PlantExport.NetStdVolumeToday	Total Flowstation Net Oil Volume Flow, Today	bbl
22.	PlantExport.NetStdVolumeYesterday	Total Flowstation Net Oil Volume Flow, Yesterday	bbl
23.	PlantExport.FWAPressureCurrentDay	Weighted Average Pressure, Today	psi
24.	PlantExport.FWAPressurePreviousDay	Weighted Average Pressure, Yesterday	psi
25.	PlantExport.FWATemperatureCurrentDay	Weighted Average Temperature, Today	degC

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S/No	Parameter	Description	Unit
26.	PlantExport.FWATemperaturePreviousDay	Weighted Average Temperature, Yesterday	degC

Table 5 : Oil Production Data Tags

In addition, hourly records of the below production tags shall be retrieved. The records shall be presented in a trend that reflects the progress of production in the course of the day

S/No	Parameter	Description	Unit
1.	ExportMeter1.BSWVolumeToday	Export Meter 1 BSW Volume, Today	bbl
2.	ExportMeter1.GrossStdVolumeToday	Export Meter 1 Gross Volume Flow, Today	bbl
3.	ExportMeter1.NetStdVolumeToday	Export Meter 1 Net Oil Volume Flow, Today	bbl
4.	ExportMeter2.BSWVolumeToday	Export Meter 2 BSW Volume, Today	bbl
5.	ExportMeter2.GrossStdVolumeToday	Export Meter 2 Gross Volume Flow, Today	bbl
6.	ExportMeter2.NetStdVolumeToday	Export Meter 2 Net Oil Volume Flow, Today	bbl

Table 6 : Oil Production Data Tags for the Hour

3.2. OIL PRODUCTION REPORT

The oil production report shall have 4 sections listed below:

- Production Summary: shall provide a summary of gross oil, net oil and BSW production volumes for the day as well as the previous day.
- Production Averages: shall provide the weighted average pressure, temperature and BS&W for the day as well as the previous day
- Production Trend: shall illustrate the trend of the gross oil, net oil and BSW production volumes for the day, based on production values reported at the top of each hour of day
- Hourly Records: shall provide a record of gross oil, net oil and BSW production values at the top of each hour of day

A sample of the Oil Production Report is shown in Appendix A

3.3. GAS PRODUCTION DATA

The table below lists the gas production data that shall be reported

S/No	Parameter	Description	Unit
1.	StationGas.FlowRatePerDay	Total Station Gas Flow Rate	mcf/d
2.	StationGas.FlowToday	Total Station Gas Produced, Today	mcf
3.	StationGas.FlowYesterday	Total Station Gas Produced, Yesterday	mcf
4.	LPGas.FlowRatePerDay	LP Gas Flow Rate	mcf/d
5.	LPGas.FlowToday	LP Gas Produced, Today	mcf
6.	LPGas.FlowYesterday	LP Gas Produced, Yesterday	mcf
7.	HPGas.FlowRatePerDay	HP Gas Flow Rate	mcf/d
8.	HPGas.FlowToday	HP Gas Produced, Today	mcf
9.	HPGas.FlowYesterday	HP Gas Produced, Yesterday	mcf

Table 7 : Gas Production Data Tags

In addition, hourly records of the below production tags shall be retrieved. The records shall be presented in a trend that reflects the progress of production in the course of the day



S/No	Parameter	Description	Unit
1.	StationGas.FlowToday	Total Station Gas Produced, Today	mcf
2.	LPGas.FlowToday	LP Gas Produced, Today	mcf
3.	HPGas.FlowToday	HP Gas Produced, Today	mcf

Table 8 : Gas Production Data Tags for the Hour

3.4. GAS PRODUCTION REPORT

The gas production report shall have 4 sections listed below:

- Production Summary: shall provide a summary of total gas production volumes for the day as well as the previous day.
- Production Trend: shall illustrate the trend of the gas production volumes for the day, based on production values reported at the top of each hour of day
- Hourly Records: shall provide a record of gas production values at the top of each hour of day

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APPENDIX A



OBIGBO FLOWSTATION

0600HRS OIL PRODUCTION REPORT

Date : 3-Mar-2019

Time : 12:00 AM

Production Summary

	Today's Totals					
	Gross Oil		Net Oil		BSW Volume	
Meter 1	2,435.0000	bbl	2,422.1019	bbl	12.8981	bbl
Meter 2	1,841.0000	bbl	1,235.6180	bbl	605.3820	bbl
Total	4,276.0000	bbl	3,657.7199	bbl	618.2801	bbl

	Yesterday's Totals					
	Gross Oil		Net Oil		BSW Volume	
Meter 1	20.0000	bbl	60.0000	bbl	16.2000	bbl
Meter 2	17.0000	bbl	120.0000	bbl	80.0000	bbl
Total	160.0000	bbl	13.2000	bbl	140.0000	bbl

Production Averages

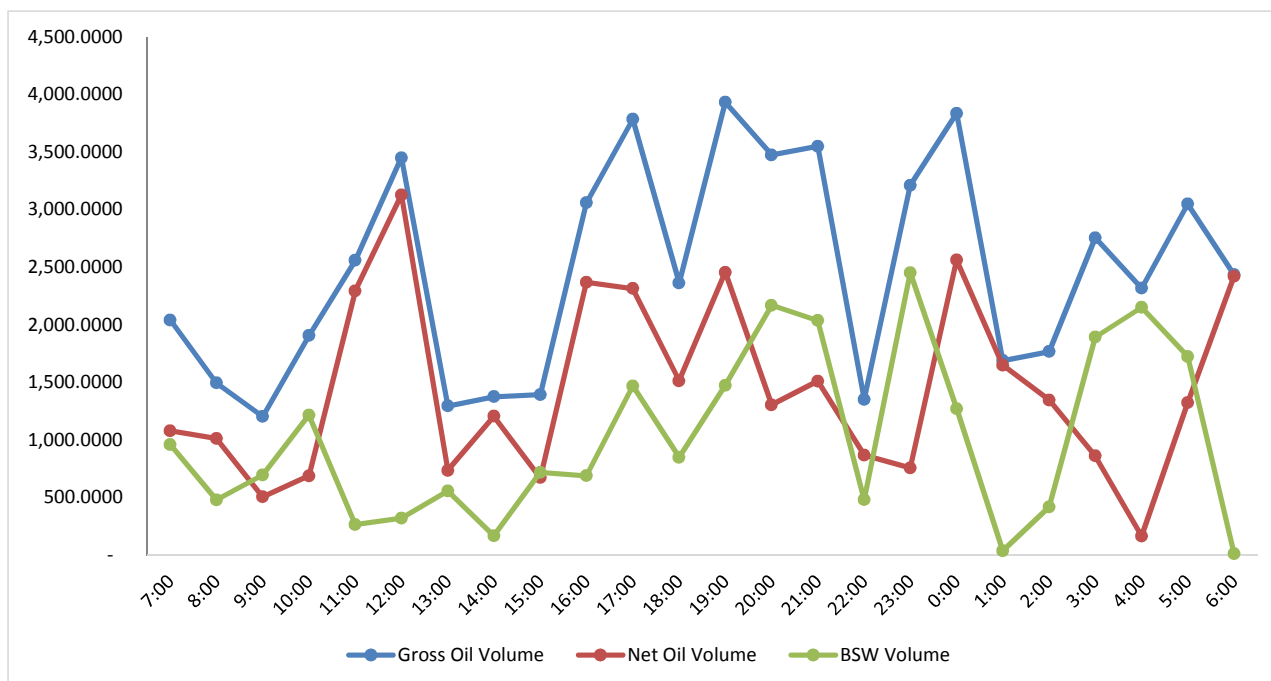
	Today		Yesterday	
Average Water Cut	14.46	%	87.50	%
Weighted Average Pressure	7.00	psig	7.00	psig
Weighted Average Temperature	23.00	degC	43.00	degC



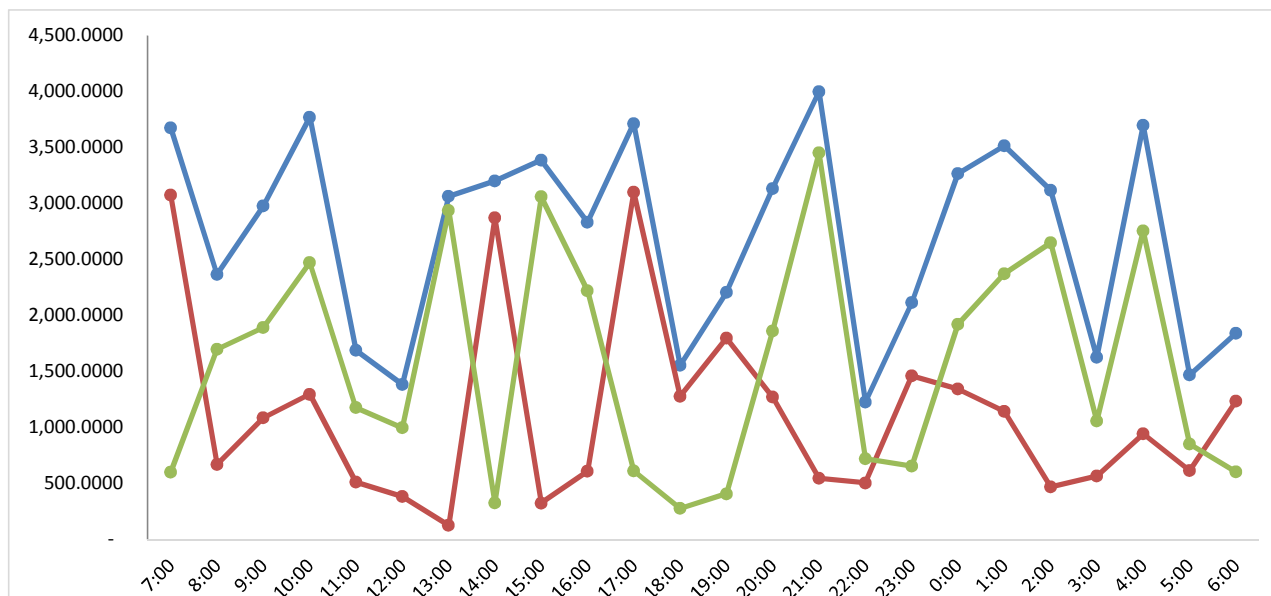
OBIGBO FLOWSTATION

0600HRS OIL PRODUCTION REPORT

Production Trend for the Day - Meter 1



Production Trend for the Day - Meter 2





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0600HRS OIL PRODUCTION REPORT

—●— Gross Oil Volume —●— Net Oil Volume —●— BSW Volume



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0600HRS OIL PRODUCTION REPORT

Hourly Records						
Hour	Meter 1			Meter 2		
	Gross Oil Volume (bbl)	Net Oil Volume (bbl)	BSW Volume (bbl)	Gross Oil Volume (bbl)	Net Oil Volume (bbl)	BSW Volume (bbl)
7:00	2,041.0000	1,080.2560	960.7440	3,676.0000	3,074.7220	601.2780
8:00	1,496.0000	1,014.8522	481.1478	2,368.0000	670.1441	1,697.8559
9:00	1,204.0000	507.1438	696.8562	2,980.0000	1,086.1136	1,893.8864
10:00	1,907.0000	689.3580	1,217.6420	3,771.0000	1,297.0576	2,473.9424
11:00	2,560.0000	2,293.9154	266.0846	1,691.0000	511.7338	1,179.2662
12:00	3,449.0000	3,126.6738	322.3262	1,384.0000	384.2969	999.7031
13:00	1,296.0000	737.1874	558.8126	3,064.0000	125.9136	2,938.0864
14:00	1,377.0000	1,207.5323	169.4677	3,201.0000	2,873.3806	327.6194
15:00	1,394.0000	673.7013	720.2987	3,388.0000	325.5627	3,062.4373
16:00	3,060.0000	2,369.2578	690.7422	2,832.0000	610.4132	2,221.5868
17:00	3,784.0000	2,315.1797	1,468.8203	3,713.0000	3,101.0562	611.9438
18:00	2,364.0000	1,514.5321	849.4679	1,557.0000	1,279.7170	277.2830
19:00	3,931.0000	2,455.9316	1,475.0684	2,207.0000	1,798.6406	408.3594
20:00	3,474.0000	1,305.1509	2,168.8491	3,134.0000	1,272.7670	1,861.2330
21:00	3,549.0000	1,511.5431	2,037.4569	4,000.0000	547.3570	3,452.6430
22:00	1,353.0000	870.3938	482.6062	1,228.0000	505.5433	722.4567
23:00	3,211.0000	758.0372	2,452.9628	2,116.0000	1,460.2379	655.7621
0:00	3,835.0000	2,563.2176	1,271.7824	3,266.0000	1,345.0379	1,920.9621
1:00	1,690.0000	1,650.2035	39.7965	3,516.0000	1,144.0654	2,371.9346
2:00	1,768.0000	1,347.7976	420.2024	3,120.0000	469.8548	2,650.1452
3:00	2,756.0000	863.0049	1,892.9951	1,626.0000	566.4944	1,059.5056
4:00	2,318.0000	166.4706	2,151.5294	3,700.0000	944.5086	2,755.4914
5:00	3,048.0000	1,323.7464	1,724.2536	1,469.0000	615.5175	853.4825
6:00	2,435.0000	2,422.1019	12.8981	1,841.0000	1,235.6180	605.3820