The Shell Petroleum Development Company of Nigeria Limited

SPDC Station Water Cut Metering Project

Handover & Acceptance Criteria

SPDC-2013-09-00000138

Version A02

	Prepared	Agreed by	Supported	Approved	Approved
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Reference indicator	JIO/G/PSO	JIO/G/PSO	JIO/G/PSR	JIO/G/PS	JIO/G/P
Title	OR&A Lead Pre_DG3	Manager OR&A	Manager ROC Programme	Production Services Manager	GM Onshore Production
Signature					
Date	11/2/2014	11/2/2014	14/02/14	25/3/14	26/3/14

ADDITIONAL AGREEMENT/APPROVAL RECORD

Team	Ref Ind	Name	Sign	Date
Land 2 East	UIO/G/PNEL2	Mathew Odhigu		07/02/14
Land 1 East	UIO/G/PNEL1	Chuks Izuogu		07/12/14
Swamp 1 East	UIO/G/PNES2	Chuks Ikeobi		07/2/14
Swamp 2 East	UIO/G/PNES2	Victor Sodje		07/02/14
Swamp 2 West	UIO/G/PNWS	Theo Odigie		10/02/14
Head Programming	UIO/G/PSH	Jonathan Azozie		10th Feb 2014.
ROCI Project Engineer	UIO/G/PSR	Bayo Balogun		10/2/14

1.0 BACKGROUND

In SPDC operations, three-phase hydrocarbon production from wells is stabilised at flow stations, separating gas from gross liquids. The gross liquid is exported via pipeline networks to central dehydration terminals, where the water is separated/ disposed of and the oil is exported. In most flow stations, the gross liquid export measurement does not include water content (water cut) measurement. Average daily station water-cut is calculated within Energy Components using periodic water cut analysis data from contributing wells and well uptimes (from production deferment data). This process inherently prone to error, given that

- Wellhead samples are not very frequent (even worsened by the security situation in the Niger Delta)
- Well outage times are inherently inaccurate as most stations are not monitored by real-time systems.
- Well testing process has inherent errors

SPDC is increasingly being challenged by external parties in the industry (including Regulators) to improve measurement accuracy for various fluid streams at various points on the integrated production system network. Incorporating online real-time water-cut measurement will greatly improve the accuracy of our daily station export volume; significantly improving SPDC's potential to objectively demonstrate pipeline crude oil theft volumes.
The Water-Cut metering project team is set up to coordinate all internal efforts aimed at installing on-line water-cut measurement on all SPDC flow stations which export wet hydrocarbon liquid to our central crude oil dehydration terminals (Bonny and Forcados) and incorporating same into the hydrocarbon allocation process by end 2014, with the ultimate objective of improving accuracy of the process.

2.0 OBJECTIVE

The Project Lead is accountable for the development of the project until the final handover to the new asset owners to ensure delivery of a complete and tested production system with the respective management system in place.

This document describes the requirement for project hand over of the Water Cut Metering project to SPDC East & West Production Asset teams. Final acceptance will take place when all the facilities have been completely installed and function tested as a fully integrated system with all existing SPDC East & West flow station facilities. All the stated acceptance criteria shall be agreed between project execution team (ROCI) and SPDC East & West Production Asset teams.

3.0 PROJECT SCOPE

The project scope is for the installation of Agar Water cut meters (WCM) and associated facilities on all SPDC East & West flow stations exporting wet hydrocarbon liquid to Bonny and Forcados Terminals by end 2014 to provide daily measured station export water cut values in Energy Components for production allocation calculations and reporting.

The project execution team (ROCI) will install Agar water cut meters, Static mixers and Mini DCS (for stations without DCS) in SPDC flow stations & NAG plants, commission and do integration works into the DCS & Energy Components taking cognizance of all HSE documentation including (Security plan, JHA, HSE plan, Method statement, MOC etc).

The process for the acceptance of the Agar water cut metering facilities commences at

commissioning, with the final acceptance and handover of facilities performed at the end of a 30 day non continuous test run period (taking into account pipeline outages) and the completeness of other project's deliverables.

4.0 HANDOVER

Handover is the point where accountability for the operations and HSE management of the Water cut meter and associated facilities is transferred from the Project execution team to the Production Asset team. The WCM will be handed over to the Production Asset team when construction, vendor works and full commissioning of the WCM has been completed and steady state performance has been achieved.

The Production Asset teams will be involved in the commissioning and function testing of the Agar water cut meter and associated facilities. Maintenance of the Agar water cut meter and Static mixers will be the responsibility of the field maintenance teams. A maintenance call off contract to be held by the Corporate Maintenance team will be put in place by the Project team for the Water cut meter for maintenance issues that cannot be resolved by the field maintenance teams.

5.0 CRITERIA & CONDITIONS FOR ACCEPTANCE

The acceptance of the facilities will be based on satisfying a set of agreed criteria. The following conditions and criteria shall guide the final acceptance of the Water Cut Metering project by the SPDC East & West Production Asset teams.

- The facilities are demonstrably safe, efficient and continuous
- All activities to address the entire scope of the Project are mechanically complete.
- Competency assessment and training for of all identified operations and maintenance staff completed.
- Full functionality and performance of the water cut metering facilities and associated equipments over a 30 day non continuous test run period.
- All operational information, documentation including operations procedures, maintenance manuals and As Built drawings has been delivered in functional and usable form to SPDC East & West Production Asset teams.
- Update Asset Register & Load MJR/SOP for Agar Water cut meter to SAP-CMMS for all SPDC East & West Production Asset teams' flow stations.
- All punch action items have been duly closed out with audit trail.
- SPDC East & West Production Asset teams' flow stations production volumes data integrated into Energy Components.
- Full delivery of operations management systems and documentation
- Action items are closed out (100%)

6.0 OPERATIONS HANDOVER DOCUMENTATION

The following documentation shall be handed over to the Production Asset teams by the Water cut project team.

- Operations procedures & manuals
- Maintenance manuals
- Updated As-built drawings
- Vendor documentations
- Final handover certificate

Final Acceptance Certificate

The Shell Petroleum Development Company of Nigeria Limited

Final Acceptance Certificate

AGAR WATER CUT METER/STATIC MIXER PROJECT

FACILITY: *Imo River 1 Flow Station*

This is to certify that above named project was delivered on this 16th day of NOV-18 formally in Acceptance to the Asset team for Operations, following satisfactory Mechanical Completion, Commissioning, Start up and Steady State/Reliability of the meter in accordance with the design intent.

Head OR&A, Post DG3 Project
Adeniran, Moses M.
SPDC-UPO/G/USO
Date: 12th - 11 - 2018

Project:
Popoola, Mobolaji
Lead, Onshore and ROCI Projects
SPDC/PTP/O/NA
Date: 12/11/2018

Ikechukwu Onyeka Digitally signed by Ikechukwu Onyeka Date: 2018.11.16 09:11:52 +01'00'

Asset:
Onyeka, Ikechukwu
Production Unit Manager, ImoR/Okoloma
SPDC-UPO/G/ULM
Date:

The Shell Petroleum Development Company of Nigeria Limited

Final Handover Certificate

AGAR WATER CUT METER STATIC MIXER PROJECT

FACILITY: Imo River Flow Station

This is to certify that above named project was delivered on this 19th day of 11-18 formally handed over to the Asset team for Operations, following satisfactory Mechanical Completion, Commissioning, Start up and Steady State/Reliability of the meter in accordance with the design intent

Manager, Onshore Assets Brownfield Project
Karumot, Adelanyo O
SPDC/PTP/O/NA
Date:

Asset Manager/Land
Ezugworie, Chibogwu C.
SPDC-UPO/G/UI.
Date: