Bonny AGS Project:
ToR For Bonny AG Facility Re-start & Readiness Review.

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Department:	SODA (Operations Readiness & Assurance)
Location:	SPDC – Port Harcourt
Language:	English
Purpose:	Terms Of Reference (ToR) for Bonny AG Facility Re-start & Readiness Review.
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Reviewed by:	Olowu, Segun, Akinsete, Sam and Oluranti-Ahmed, Ranti
Approved by:	Oruerio, Steve

Project Manager, DOMGAS & FYIP

Table Of Contents **PAGE**

1. Bonny AGS Facility Start-Up Status.

Bonny AG achieved first gas in July 2012 and exported commercial gas in December 2012 achieving a continuous 12-hr operation same day. Thereafter, spurious trips traced to vibration of the inlet scrubber level transmitter prevented the commencement of the 72-hr and 90-day reliability operations of the Plant.

In Q2 2013, Contractor remobilised to site to resolve vibration problems caused by misaligned spools, completed all outstanding works and secured/revalidated SoF for the AG plant. Contractor then commenced mobilisation of the OEM vendors required to support the restart of the plant and its performance/reliability tests. Unfortunately, the prolonged outage of the TNP from June to October 2013, due to damaging effects of illegal oil theft, could not allow the 72hour performance and 90 day reliability tests to take place. SPDC thus requested the Contractor, mid July 2013, to demobilise all resources on standby to control the huge PMT cost being incurred; until the TNP and by extension, the base flow station becomes available.

The TNP availability pattern has remained precarious, necessitating change of Facility Handover strategy from total to phased. The Utilities scope (not dependent on TNP availability) was successfully completed and handed over to receiving Asset Team in 2014 and has been in the operate phase since then.

Post EPC demob in 2013, the Bonny AG Facility commissioning team adopted a strategy of mobilising the start-up team to site to commence facility re-start and follow-up performance tests, as long as TNP availability lasted. Between 2014 and 2015, several attempts were made to re-start the facility but were largely marred by a combination of insufficient TNP availability time, Technical challenges and possible AG volume shortfall.

To address the suspected AG shortfall, 1 additional well has been produced through the existing base FS. The introduction of the additional well is believed to have had minimal impact to the available volumes, leading to need to investigate and re-confirm available AG volumes. A team was put together to assist verify accuracy of the AG metering facilities in August, '15 but full investigation was hampered by some technical challenges, captured in their report.

2 General Information

Project / Asset:	Bonny AG Facility PHC Swamp 1 (NES1)
Location (s):	Field Facilities located at Oloma, Rivers State. Asset Office at SPDC PHC
Sponsor (s):	Oruerio, Steve
Timing:	16 ~ 23rd Sept, 2015
Duration:	1 wk

3. Objectives

A small team will be set up, involving key FODA Project execution team members, external service providers / support teams and Asset Optimisation team to primarily verify readiness of the AG Facility for re-start (clearly identify possible technical challenges that will form pre-works building up to target re-start date). The team will also start up the plant and attain steady state flow for a duration of about 24 hours, as proof of readiness of plant to start up.

Following will additionally be established by the team:

1) Investigate overall Facility control related technical challenges and verify authenticity of the claim or otherwise that controls of the Base Flowstation Facility may not be fully independent of the AG Facility, in line with the design requirements (Attempt to export AG from the AG compressor, seems to trigger FS shutdown on low HP static).
2) Verify physical readiness of all systems / sub-systems for facility re-start.
3) Identify key Technical bottlenecks / challenges, which may not permit facility re-start and are yet to be resolved.
4) Verify that implementation of approved changes via the Mini-Hazop conducted in 2014 to address facility start-up challenges have been completed (including critical set-point recommendations by the OEM).
5) Start up the AG facility and sustain steady state flow for a minimum of 72 hrs. Establish actual turndown of compressor.

4 Verification Scope

The scope of the re-start readiness review will cover the following:

- Desktop review of applicable documentation (Drawings / Technical documentation, Operating Manuals, Instrumentation & Control / Safeguarding Memorandum, Process, etc) with a view to re-confirming suitability for facility re-start.

- Review of key Process and control set-point changes, Start-up sequence, completion of resolution of earlier identified Technical challenges, Completeness of implementation of Mini-Hazop recommendations and outstanding punch-list items.

- Assessment of readiness of all equipment and instrumentation involved in the planned facility re-start for the commissioning, performance testing and steady state operation.

- Review applicable documentation and re-establish Facility turn-down ratio that has been implemented in the design.

- Check to ascertain the volume of gas available as feed into the AG Facility.

- Establish the implication of the non-commissioning of the Ejector scope.

5 Methodology

The team will carry out field visits as required to the Oloma AG Facility, primarily to gather information via observation, interviews and physical checks of facilities. Desktop review will be carried out concurrently, targeting key Technical specification and relevant documentation to fully support field review activities. Special attention shall be focused on the impact of changes introduced in the course of previous start-up attempts, especially the key set-point changes advised by the compressor OEM (Propak).

The Bonny AG commissioning team shall be required to support the team both at the desk top review and the site activities since they have most of the history and are conversant with the facility

Conscientious efforts will be made to verify findings and to confirm the validity of recommended actions targeted to address observed shortfalls. Where judgment is required, the final decision rests with the Verification team leader.
The PACO, Rotating equipment and process Discipline Leads shall provide independent discipline assurance on the findings from the Team.

6 Team Members

Olowu, Segun	-	Readiness Verification Team Leader, SPDC / SNEPCO
Madu, Nwankwo	-	Process, SPDC / SNEPCO
Saveri-Dhas, Eugene	-	CD Co-ordinator, SPDC / SNEPCO
Ede, Festus	-	OR&A, SPDC / SNEPCO
Roberts, Brian	-	Commissioning Lead, SPDC / SNEPCO
Benvenuto, Stefano	-	Compressor Expert, SPDC / SNEPCO
Aderinto, Gbadebo	-	Bonny AGS Project Lead, SPDC / SNEPCO

7 Reporting.

- The team will deliver a close out presentation, summarizing key findings & recommendations.
- The team will document all key findings & recommendations.

8 Follow Up.

- All identified action items should be owned and implemented by the Task force to achieve successful start-up and performance test.

9 References:

The principal documents for review will include:

- HAZOP and Mini-HAZOP reports
- Bonny AGS Project Specifications and Standards;
- Process Flow Diagrams, P&ID's and related drawings;
- Management of Change procedure;
- Production Integrity Management System and associated documentation (e.g. Operating Procedures / Manuals, concurrent operations, etc.)
- Mechanical completion, Pre-commissioning & Commissioning and startup plans and procedures;
- Facility Preservation Procedure, strategy and current status