Onshore Engineering Nigeria
(Operations Support and WRFM)

Plant Capacity Test Closeout Report

Technical Note: Gbaran CPF 1.26 Bscfd Capacity Test Closeout Report

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Revision History

REVISION STATUS			SIGNATORIES		
Rev.	**Date**	**Description**	**Originator**	**Reviewer(s)**	**Approver**

- Preliminary issue will be issued as P01
- Revisions for review will be issued as R01, with subsequent come as R02 etc.
- Revisions approved for Implementation/Design Issue/Eng. will be issued as A01, with subsequent come as A02 etc.
- Revisions approved for Tender will be issued as T01, with subsequent come as T02 etc.
- Revisions approved for Construction (AFC)/Purchase will be issued as C01; with subsequent comes as C02 etc.
- Highlights of sections revised from previous approved issues or reasons for version change are to be listed in the description box
- All revisions to this document must be signed by the relevant Technical Authority (TA1, TA2 or TA3)

Signatures for this revision Signatures for this revision

Role	Name / Role	Signature	Date
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Reviewer	Burahimo, Rasheed		06/11/2017
Approver	Adoga, Inalegwu		06/11/17

More field(s) could be added for signature if additional agreement/approval is required

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ABBREVIATIONS

Bscfd	Billion Standard Cubic Feet per Day
CPF	Central Processing Facility
GSA	Gas Sales Agreement
MMscfd	Million Standard Cubic Feet per Day
TEG	Tri-ethylene Glycol
WRFM	Well, Reservoir and Facility Management

Contents

1.0 INTRODUCTION

The Gbaran Operations Support and Operations teams utilized the available ullage in Gbaran CPF dehydration trains for extra 10 MMscfd gas production. The facility nameplate capacity is 1.25 Bscfd (625 MMscfd per train), however, production up to 1.26 Bscfd is within the plant operating envelope and was recently tested. Each dehydration train was tested to 630MMscfd (1.26 Bscfd for the two trains) and sustained for about 72 hours between the 5th to 9th of October, 2017.

This report documents the results of the test to demonstrate that production up to 1.26 Bscfd is within the plant operating envelope and can be adequately handled without any safety implications.

The capacity test to 1260MMscfd (630MMscfd per dehydration train) is an extension of the 1250 MMscfd (625 MMscfd per dehydration train) which was succesfully carried out from the 6th to the 11th of December, 2016. The opportunity for a further production increase of 10 MMscfd was jointly analysed and identified by the facility Process Engineer and the Operations team. The analyses shows that operating the facility at 630 MMscfd per dehydration train is within the plant operating envelope and can be safely handled.

1.1. Critical Monitoring and Logging

Key process and safety parameters were monitored and logged. See attached monitoring sheet - Attachment 1 for full list of logged parameters.

Critical parameters include:

- Individual trains flow rates
- Sales gas quality (dew point)
- Temperatures (Process gas, TEG, etc)
- Gas export pressure

1.2. Capacity Test Results

The two dehydration trains were tested to 1260MMscfd from the 5th to 9th of October, 2017. Flow for trains 1 & 2 was ramped up from 625MMscfd to 630MMscfd simultaneously and maintained for about 72 hours. The average sales gas dew point recorded was about 0.3°C at 95 bara which is within the GSA specification of 5°C (max.) at 95 bara (see attached parameter log sheet).

2.0 CAPACITY TEST PROFILE

The ramp-up profile for the Gbaran CPF capacity test is as shown in Figure 1.1 below. The profile shows that a flow of ca. 1260 MMscfd (i.e. 630 MMscfd per train) was achieved and maintained for about 72 hours. All other recorded parameters are within specifications as shown in the attached parameter logsheet. The profile shows that, in line with the operating envelope, flow of 630 MMscfd per dehydration train can be safely processed.

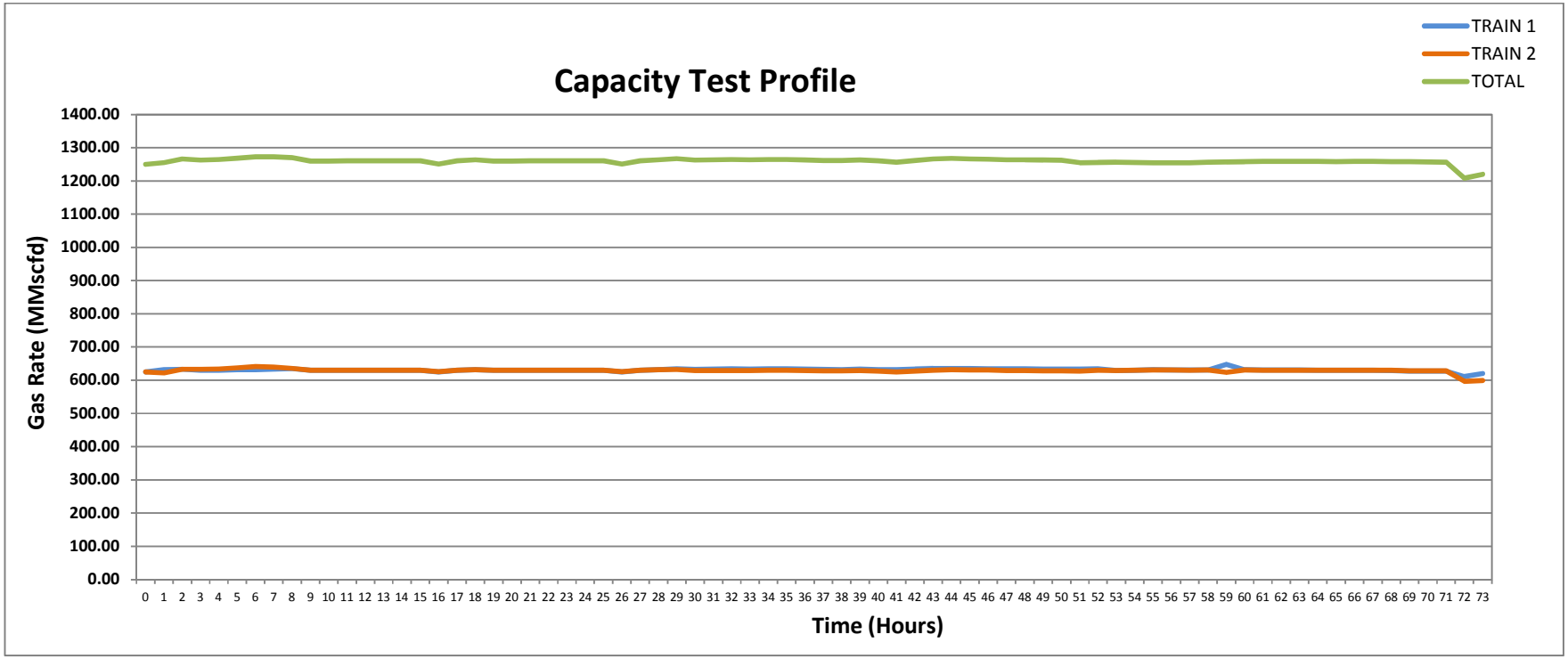

Figure 1.1: 1.26Bscfd Capacity Test Profile

3.0 DEFINITION OF SUCCESS (KEY PERFORMANCE INDICATORS)

The capacity test was deemed successful as the following key performance indicators were achieved.

1. A steady-state flowrate of 1260MMscfd (i.e. 630MMscfd per dehydration train) for the test duration.
2. The sales gas dew point recorded was about 0.3°C which is within the GSA specification of 5°C (max.) at 95 bara.
3. Vibration levels recorded were within acceptable limits.
4. There was minimal glycol loss. There was no noticeable drop in glycol levels in the regeneration system.

4.0 CAPACITY TEST TEAM

The execution of all activities regarding the Gbaran CPF capacity test was managed and performed by an integrated team led by the Gbaran Operations Superintendent and the Facility Process Engineer from the Operations Support & WRFM team. The integrated team comprised of the following; Gbaran Asset team, facility Process Engineer from the Operations Support & WRFM team, Production Chemistry Personnel and Condition Monitoring Consultants.

5.0 CONCLUSION

From the results of the capacity test, the Gbaran-Ubie CPF dehydration trains is capable of processing 1260 MMscfd of gas which is within the plant operating envelope. The average export gas dewpoint at this flow rate was observed to be about 0.3°C at 95 bara which is within the GSA specification of 5°C (maximum) at 95bara. Also, there was no unusual noise and vibration noticed compared to results at 1250 MMscfd (the plant nameplate capacity).

6.0 ACCEPTANCE

GBARAN UBIE INTEGRATED OIL AND GAS PROJECT

CENTRAL PROCESSING FACILITY

DEHYDRATION TRAINS CAPACITY TEST

FINAL ACCEPTANCE

☑ ACCEPTED ☐ NOT ACCEPTED

This is to certify that Gbaran CPF with nameplate capacity of 1.25 Bscfd (625 MMscfd per dehydration train) can safely and reliably operate at a production rate of 1.26 Bscfd (i.e. 630 MMscfd per dehydration train).

Name/Position	Team Indicator	Signature	Date
Adoga, Inalegwu (Head Process Engineering)	SPDC-PTE/EUPE		06/11/17
Oji, Eberechukwu (Asset Manager, Central Hub)	SPDC-UPO/G/PM		06/11/2017

7.0 REFERENCES

1. Gbaran-Ubie Central Processing Facility Operating Envelope Study, SPDC-2016-06-00000175.
2. Gbaran-Ubie Central Processing Facility 1.25 Bscfd Capacity Test Closeout Report, SPDC-2016-12- 00000071 Rev. A02.
3. Gbaran-Ubie Central Processing Facility 1.25Bscfd Capacity Test Procedure, SPDC-2016-08-00000082, Rev. A02, Oct. 2016.

8.0 ATTACHMENTS

1. Gbaran CPF 1.26 Bscfd Plant Capacity Test Log Sheet:

Gbaran 1.26 Bscfd Capacity Test Result:

2. Capacity Test Profile

Capacity Test Profile.xlsx