

## FLASH GAS COMPRESSOR OPP PLANT

TOTAL E&amp;P BORNEO B.V.

TOTAL E&amp;P DEEP OFFSHORE BORNEO B.V.

**Identification**

Onshore Processing Plant (OPP)  
 System: Flash Gas Compressor System  
 Issue detection: Excess Flaring Issues

**Abstract**

Flaring of unused associated gas currently accounts for nearly one-third of TOTAL's greenhouse gas emissions worldwide. Since 2000, the TOTAL Group has banned continuous flaring in all new projects. In 2004, TOTAL Group joined the public-private Global Gas Flaring Reduction (GGFR) Partnership, initiated in 2001 by the World Bank, and has pledged to halve flaring at our operated sites between 2005 and 2012.

In Brunei Darussalam, Total E&P Borneo BV (TEPB) is the operator for Block B joint venture with Shell Deep-Water Brunei Ltd & Brunei Government. Hydrocarbons extracted from Block B are transported via pipelines to the TEPB Onshore Processing Plant (OPP) in Lumut.

At the TEPB OPP, the hydrocarbons are separated into gas and liquid (condensate and water). The gas is treated further before it is delivered to the BLNG plant. Similarly, the liquids are eventually sent to the Seria Crude Oil Terminal (SCOT) and the excess gas is flared.

- ◆ **Maharaja Lela Jamalulalam field**

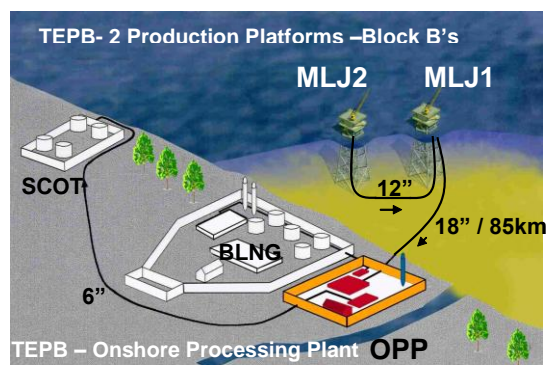
- Production of gas, condensate & water.

- ◆ **Offshore facilities**

- Two production wellhead platforms: MLJ-1 and MLJ-2.
  - 2.5 km / 12" MLJ-2/MLJ-1 sea pipeline.
  - 85 km / 18" MLJ-1/OPP sea pipeline.

- ◆ **Onshore facilities**

- Reception of well fluids in slugcatcher (800 m<sup>3</sup>).
  - Separation of gas and liquids.
  - Gas processed to remove mercury and CO<sub>2</sub>.
  - Delivery to BLNG (distance 700 m). LNG is exported to LNG ship via two 16" line on a 4.5 km Jetty.
  - Liquid processed to separate and stabilise condensate and water.
  - Delivery to BSP Seria Crude Oil Terminal (SCOT, distance 17 km). Crude oil is exported to oil tanker via Single Buoy Mooring (SBM).



However, the concept of flaring is not only to remove excess gas out of the liquid stabilization process, it is also a very important component for safety measure, i.e. to handle situations in case of any emergency, such as during blow down or relief situation.

TEPB-REX-02

General Overview of the Flash Gas Compressor System

- ◆ Total E&P Borneo B.V has installed an 80-tonne Flash Gas Compressor (FGC) into its system operation. This enables the TEPB OPP to compress gas to be transferred back to the gas treatment facility for sale to BLNG. From the environment perspective, it will help reduce at least half of the current flaring at the TEPB OPP.
- ◆ Total E&P Borneo B.V aims at minimizing continuous flaring:
  - to improve Onshore Processing Plant efficiency
  - to reduce Environment impacts (to meet Total HSE targets and ISO 14-001 requirement)

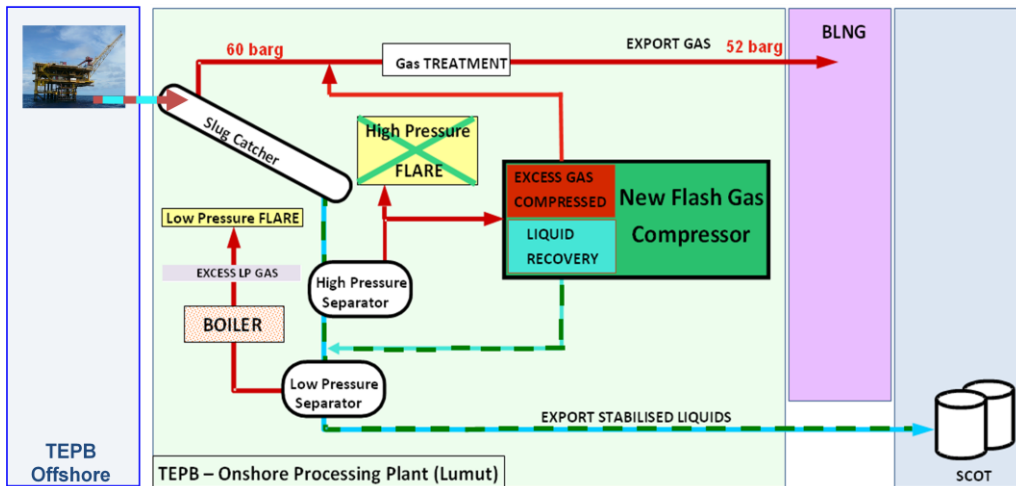


Figure 1: Installation of the Flash Gas Compressor unit in the process plant.

- ◆ Installation of the compressor to recover excess gas liberated during oil stabilization process.
- ◆ Total flaring reduced from 120,000sm<sup>3</sup>/day down to 20,000sm<sup>3</sup>/day.

Before compressor installation	Flash gas compressor installed	After compressor installation

Figure 2: Size of the flare before and after the installation of the Flash Gas Compressor

**Key Words:**

Flash Gas Compressor  
Flaring

# TEPB/OPS - FEEDBACK NOTE

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- ◆ Before the initiation of the FGC unit in the process plant system, the stabilization of liquids at OPP is required prior to transport to SCOT facilities. This was achieved by a 2-stage separation process:
  - 1st stage: IP separator, currently operating at approximately 8.5 barg and 55 - 70 °C.
  - 2nd stage: LP separator, currently operating at approximately 2 barg and 85 - 95 °C.
- ◆ At both stages of the liquid stabilization process, flash gas is liberated which is used as follows:
  - LP gas, estimated at present to be 27,200 sm<sup>3</sup>/d with the following usages:
    - Purge gas for the flare system, estimated to be 3000 to 3200 sm<sup>3</sup>/d.
    - Fuel gas for steam generation (used for DEA regeneration and liquid stabilization processes) estimated to be 14,000 sm<sup>3</sup>/d.
    - Excess LP gas estimated to be 10,000 sm<sup>3</sup>/d is flared.
- ◆ The gases liberated during the process of liquid stabilization are flared causing potential economic loss and damage to environment.
- ◆ The Flash Gas Compressor system unit consists of:
  - An IP compressor skid to compress IP gas from 4.5 barg to 60 barg, for injection into the slugcatcher gas stream.
  - Liquid from scrubbers is routed into LP separator.
  - An air fan fin cooler skid.

**Table 1:** Gas Flared with and without Compressor

Gas Flared	Without Compressor	With Compressor
High Pressure flared gas	90,000 sm <sup>3</sup> /d	0 Msm <sup>3</sup> /d
Low Pressure flared gas	30,000 sm <sup>3</sup> /d	20,000sm <sup>3</sup> /d

**CONTACT US:**  
**AMAL.YUNUS@TOTAL.COM**  
**JUAN.MANDARA@TOTAL.COM**  
**YAH-TAK.TAN@TOTAL.COM**