Using PipelineStudio® from Emerson (formerly Energy Solutions International), Transierra S.A. has successfully planned and optimized a capacity expansion for a critical natural gas pipeline.

Margarita Natural gas field output is connected through a 10" set line (17km) with Sabalo GASAN gas field export lines 28" OD (20km), which goes to Villamontes GASYRG compressor station (MOP 1440 Psig) and is connected with Yabog.

Average Volume Margarita = 1.43 Mmcd
Average Volume San Antonio = 13.39 Mmcd
Total Volume SAN + MGT = 14.82 Mmcd
Pressure out San Antonio = 1080 Psig
Pressure in Villamontes = 1030 Psig
“Gasan” Maximum Transport Capacity
The maximum design transport capacity is 21 MMCD. To achieve this, an output pressure of 1080 Psi (Sabalo) is required and arrival pressure of 1030 Psig (Villamontes) as shown in the simulation below.

To increase transport volume and meet the GTCS, we propose the following alternatives based on simulation:
1. Independent booster system
2. Integrated booster system
3. Loop + booster independent/integer

Current Transportation System

Transport Capacity with System Compression Booster
Installing a booster compression system, at operating conditions of:
- Suction Pressure = 850-900 Psig
- Discharge Pressure = 1030 Psig
- Sabalo Pressure = 1073 Psig
- Required Power (Approx.) = 8400 Hp is reached at 34 Mmcd Transport Capacity
Operating Condition Alternative - 1

Alternative - 1 28/34 Mmcd
Alternative - 1 28/34 Mmcd

Transport System’s Simulation, Using PipelineStudio, Ver. 3.1
Gasan with Loop 28 Mmcfd
As has been mentioned before, it is required to build a 7Km Loop and 28 OD to increase the transport capacity.

The simulation shows that, to achieve an arrival pressure of 1036 Psig (Villamontes) with a 28 Mmcfd Flow and an output pressure 1080 Psig (Sabalo Gas Plant), it is not necessary to use compression for this volume, because the conditions of delivery are achieved at this point.

Gasan with Loop 7 KM

The simulation shows that, to achieve an arrival Pressure of 979/940 Psig (Villamontes) with a 34 Mmcfd Flow and an output pressure 1050/1080 Psig (Sabalo Gas Plant), it is necessary to use compression for this volume, because the conditions of delivery required are not achieved at this point.

Gasan with Loop 7 KM with Booster

The simulation shows that, to achieve an arrival Pressure of 1030 Psig (Villamontes) with a 34 Mmcfd Flow and an output pressure 1080 Psig (Sabalo Gas Plant), it is necessary to use a system compression booster with a power of 3000 Hp.