

# ENHANCED LOW PRESSURE CONDENSATE RECOVERY SYSTEM (ENHANCED LP-CRS™)

## REVOLUTIONARY SOLUTION FOR EMISSION REDUCTION FROM FLARE GAS

Extract valuable hydrocarbon condensates from low-pressure gas, including flare gas, while reducing greenhouse gas emissions with the Enhanced LP-CRS™. This patented, multiple award-winning system is a highly efficient and cost-effective method of NGL extraction suitable for onshore and offshore applications.

With four standard capacity ranges, the Enhanced LP-CRS™ is available in easily transportable, plug-and-play units that enable quick reduction of emissions and increased revenue without compromising on efficiency. It is the perfect solution for those looking to monetize their flare gas or optimize their natural gas liquids production.

## UNPARALLELED PERFORMANCE

The Enhanced LP-CRS™ is designed to extract Natural Gas Liquids (NGLs) from natural gas streams ranging from 20 to 100 barrels/MMscf, with inlet gas pressures as low as 3 barg and a corresponding reduction of greenhouse gas (GHG) emissions by up to 30%. It achieves this without the need for inlet booster compression or external refrigeration nor gas dehydration thus making it a high-performance solution for NGL extraction that is also highly reliable and compact.

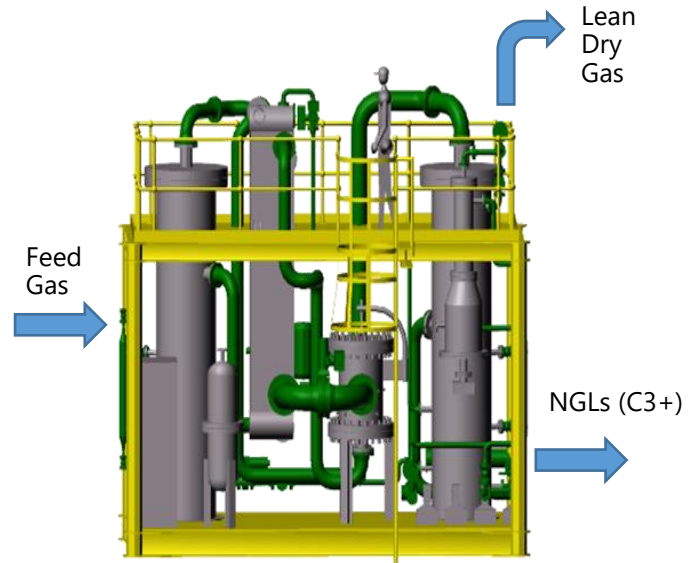
## TECHNOLOGICAL ADVANCEMENTS: THE SCIENCE BEHIND THE ENHANCED LP-CRS™

The Enhanced LP-CRS™ uses a series of heat exchangers, separators, and a proprietary compact turbo-expander and employs NGLTech's patented expansion cooling and evaporative cooling technology to achieve deep chilling of the NG stream. This process cools the NG stream down to as low as -40°C, which separates the heavy ends (C3+) from the NG stream. The combination of expansion and evaporative cooling results in an extremely efficient cooling process that is the key to the high performance of NGL extraction. Methanol is used as a Hydrates Inhibitor (HI) and is regenerated within the package to minimize methanol make-up requirements.

## APPLICATIONS

The Enhanced LP-CRS™ has versatile applications. It can cost-effectively monetize flare gas by extracting valuable NGLs while reducing GHG emissions when the lean dehydrated gas is used as fuel gas or flared. The system is also very effective as a fuel gas conditioning system. The NGL lean and dehydrated gas may also be routed to a downstream system for monetizing the residue lean gas produced.

Extracted NGLs can be co-mingled with the export crude oil stream to increase crude volume and quality, stored separately in LPG bullets, or routed to a condensate stabilizing column for condensate stabilization and LPG extraction as separate products.



## NOW WITH FOUR (4) STANDARD MODELS

Featuring four (4) key improvements:

- Higher Production Gain
- Greater Emission Reduction
- Smaller Footprint
- Quicker Delivery

## KEY FEATURES AND BENEFITS

- Highly efficient and cost-effective NGL extraction
- Extracts NGLs from natural gas with low inlet pressure (minimum 3 barg)
- Reduces greenhouse gas emissions up to 30%
- Available in four capacity ranges
- Compact, self-contained design for easy transport and installation
- Methanol used as Hydrates Inhibitor and regenerated for reduced make-up requirements.
- Versatile applications including flare gas monetization, fuel gas conditioning, and crude volume and quality enhancement.
- Extracted NGLs can be comingled with export crude oil, stored separately or routed for condensate stabilization and LPG extraction.

## LP-CRS™ GENERAL SPECIFICATIONS & MODELS

Model No.	LP-CRS-05	LP-CRS-10	LP-CRS-15	LP-CRS-20
<b>Nominal Design Capacity</b>	3 to 7 MMscfd	7 to 12 MMscfd	12 to 17 MMscfd	17 to 22 MMscfd
<b>Skid Size (W, L, H)</b>	2.3m, 5.3m, 5.0m	2.3m, 6.0m, 5.5m	2.3m, 6.5m, 5.8m	2.3m, 7.0m, 6.0m
<b>Skid Weight (dry)</b>	20,000 kg	25,000 kg	30,000 kg	40,000 kg

### Feed Gas Conditions<sup>1</sup>

Inlet Pressure Range 3 to 10 barg  
 Inlet Temperature ≤ 45°C

### System Typical Performance

NGLs Recovery 20 (lean gas) to 100 (rich gas) barrels/MMscfd  
 GHG Emission 20% to 30% reduction  
 Availability > 97% uptime  
 Turndown ~ 30%  
 Methanol (hydrate Inhibitor) make-up 10L/MMscf

### Product Specification

Gas Outlet Lean Dry Gas @ 60°C and 50% of inlet gas pressure.  
 NGLs Outlet Recovery of up to 75% for C3, 90% for C4 and 99+% for C5+.

### Mechanical Construction

Vessels/Piping Stainless Steel (SS316L)  
 Vessel Design Code ASME VIII Division 1  
 Piping Design Code ASME B31.3  
 Heat Exchanger BAHX (Braced Aluminium)  
 Titanium P&F

### Instrument System

4-20mA HART  
 CENELEC/ATEX Zone 2, Ex'd IP56  
 On Skid Control Panel with HMI  
 CPU for Control & Shutdown  
 Serial Link / Radio Interface

**Instrument Air Supply** 5 to 8 barg@ 0°C water dew point

**Electrical Supply** AC 3 Phase 440 kVA, 50/60Hz



1. System can be customized based on request to meet customer specific requirements.
2. Larger capacities available based on request.
3. Lower or higher supply pressures can be accommodated with customization of system.
4. Higher inlet temperatures will require customization to suite.
5. NGL recover and GHG emission reduction will depend on feed gas composition.

*Unlock revenue and sustainability with Enhanced LP-CRS™; the compact, plug-and-play solution that guarantees high performance, low maintenance, and quick delivery in four standardized models. Monetize flare gas and optimize NGL production with ease and affordability, achieving payback in just months.*

### TRACK RECORD



Topside Engineering,  
Procurement & Construction  
(EPC) of LP-CRS for Anjung  
Kecil Field, Offshore Sarawak,  
Malaysia.

Client:  
MISC Berhad and  
Vestigo Petroleum Sdn Bhd

Operating Envelope:  
Max Oil : 708 BOPD  
Max Gas : 15 MMscfd



Topside Engineering,  
Procurement & Construction  
(EPC) of LP-CRS for  
Tembikai Field, Offshore  
Peninsular Malaysia.

Client:  
Vestigo Petroleum Sdn Bhd

Operating Envelope:  
Max Oil : 370 BOPD  
Max Gas : 8 MMscfd



Topside Engineering,  
Procurement, Construction,  
Installation &  
Commissioning (EPCIC) of  
LP-CRS for Erb West Field,  
Offshore Sabah, Malaysia.

Client:  
PETRONAS Carigali (SBA)  
Sdn Bhd

Operating Envelope:  
Max Oil : 787 BOPD  
Max Gas : 23 MMscfd



Topside Engineering,  
Procurement & Construction  
(EPC) of LP-CRS for Galoc  
Facility, Offshore Philippines.

Client:  
Tamarind Resources Pte Ltd

Operating Envelope:  
Max Oil : 662 BOPD  
Max Gas : 32 MMscfd

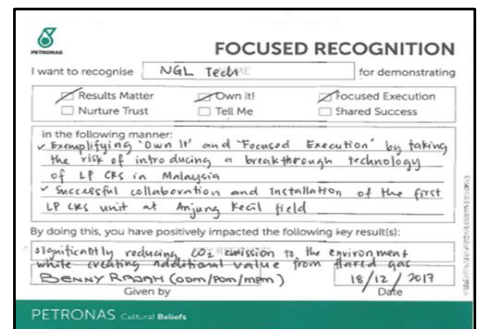
### AWARDS & RECOGNITION



Winner of  
ICChemE Malaysia Awards 2018  
for Oil & Gas Award Category



Winner of  
OTC Asia Spotlight 2018 on  
New Technology Business Award



Focus Recognition Certificate from  
PETRONAS Carigali (SKA) Sdn Bhd  
for LP-CRS Anjung Kecil Field