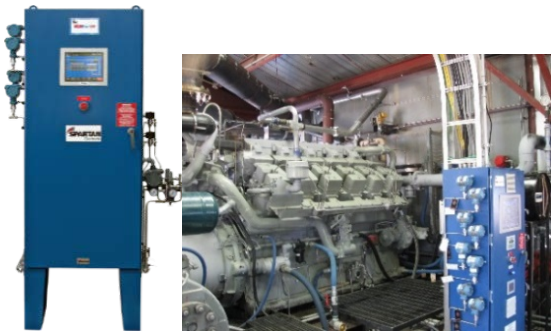
5.1.1. Spartan Controls Ltd. – REMVue Air-Fuel Ratio (AFR)	July 31, 2017

Description



REMVue® Air-Fuel Ratio Control systems allow engines to operate at different air-fuel ratios than the original engine design, allowing them to run on less fuel gas. The REMVue®-AFR is a patented air-fuel ratio control system, providing rich-to-lean conversion and engine control optimization. It is the only patented rich-to-lean conversion system available for rich-burn engines. The system can be configured to operate as a stand-alone control system, or it can be integrated with other hardware or software systems. The REMVue®-AFR can be applied to a wide variety of rich burn or lean burn engines, resulting in an average of 15% fuel savings, improved runtime, and reduced NOx emissions (MSAPR compliance levels).

Technology Group

Engines and Compressors – Facilities Design and Equipment

Site Applicability

Oil and gas facilities; sweet and sour service, any rich-burn or lean-burn natural gas engine

Emissions Reduction and Energy Efficiency

Up to 2,000 tons CO_2e annually, depending on engine and tuning of the system.

Economic Analysis

Capital Cost:	Capital costs range from $40,000 to $60,000. However, these costs vary based on location, type of engine, and number of units purchased.
Installation Cost:	Installation costs range from $40,000 to $60,000 depending on the size of engine/compressor and the addition of optional features.
Operating Cost:	Improved engine optimization generally reduces operating costs by an average of 10%.
Maintenance Cost:	The REMVue®-AFR results in no additional maintenance costs as it does not require any special skills beyond existing operations.
Carbon Offset Credits:	The REMVue®-AFR is eligible for carbon-offsets as per the Alberta Offset System Quantification Protocol for Engine Fuel Management and Vent Gas Capture Projects.

Payback, Return on Investment and Marginal Abatement Cost:	Based on fuel savings, reliability improvements, and carbon offsets, payback can be expected within 3-16 months. This payback does not take into account the value of reduced equipment wear, such as cylinder heads, nor increased production.

Reliability

Expected Lifetime:	The equipment is expected to last the lifetime of the facility.
Maintenance:	No special maintenance considerations apply.

Safety

No additional safety considerations apply.

Regulatory

- CSA, Class1 Div 2 hazardous approval
- Recognized for NOx emissions compliance by AER and Environment and Climate Change Canada
- (MSAPR)
- Recognized as compliant solution for the Alberta Engine Fuel Management and Vent Gas Capture Protocol and the BC META protocol

Vendor Information

Company Name:	Spartan Controls Ltd.
Company Website:	http://www.spartancontrols.com
Product Website:	http://www.spartancontrols.com/applied-technology/rotating-and-reciprocating-equipment/engine-and-compressor/air-fuel-ratio-controllers/remvue-afr/
Contact Person:	Cam Dowler
Contact Phone#:	(403) 695-2318
Contact Email:	Dowler.Cam@spartancontrols.com