



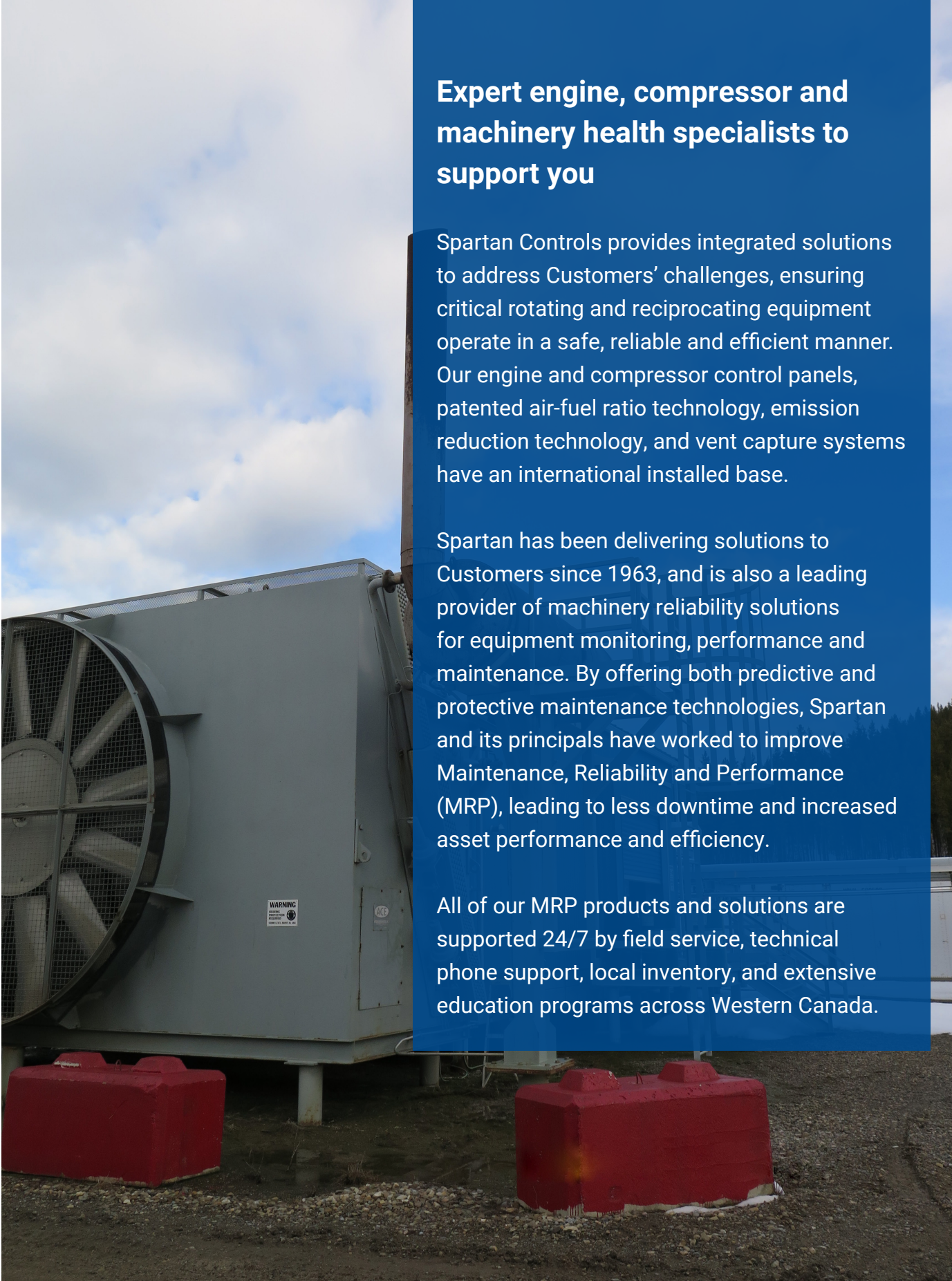
Automation | Valves | Measurement | Process Control

## EMISSIONS SERVICES OVERVIEW

Multi-sector Air Pollutants Regulations  
compliance testing for engines, boilers and  
heaters







## Expert engine, compressor and machinery health specialists to support you

Spartan Controls provides integrated solutions to address Customers' challenges, ensuring critical rotating and reciprocating equipment operate in a safe, reliable and efficient manner. Our engine and compressor control panels, patented air-fuel ratio technology, emission reduction technology, and vent capture systems have an international installed base.

Spartan has been delivering solutions to Customers since 1963, and is also a leading provider of machinery reliability solutions for equipment monitoring, performance and maintenance. By offering both predictive and protective maintenance technologies, Spartan and its principals have worked to improve Maintenance, Reliability and Performance (MRP), leading to less downtime and increased asset performance and efficiency.

All of our MRP products and solutions are supported 24/7 by field service, technical phone support, local inventory, and extensive education programs across Western Canada.



# MULTI-SECTOR AIR POLLUTANTS REGULATIONS COMPLIANCE

For over 50 years, Spartan has provided expertise and solutions for its Customers' compression equipment.

Starting in the late 2000s, Spartan participated in the consultative process that was part of the Multi-sector Air Pollutants Regulations (MSAPR) legislation. We have worked with industry, Environment Canada and provincial regulators to understand the regulations and their impact on engine fleet operations.

Published on June 26, 2016, MSAPR regulations limit the amount of NO<sub>x</sub> emissions from stationary natural gas engines, the cement sector and two equipment types (i.e. gaseous-fuel-fired non-utility boilers and heaters).



Specific to this MSAPR legislation, we have developed a web-based MSAPR fleet analysis and decision support tool that enables users to enter their engine fleet data to determine:

- Current engine fleet NO<sub>x</sub> average
- Best technology solutions for each engine to reduce NO<sub>x</sub>
- Forecasted capital spend to upgrade engines and expected associated NO<sub>x</sub> reductions
- A return on investment (ROI) calculator that enables an analysis of technology upgrade benefits vs capital spend
- A year by year plan of technology, NO<sub>x</sub> reductions and capital spend to enable planning program execution

# ENGINE AND COMPRESSOR EXPERTISE

## Emission compliance with an ROI— only with Spartan Controls

An important part of an initial and on-going MSAPR compliance plan is specialized emission stack testing for engines and boilers.

Spartan has a wide range of emission testing services available using the protocols specified by the MSAPR:

- Spot checks
- Emission checks
- Performance tests
- Spot check before and after air-fuel ratio (AFR) upgrades, tuning or repair

Our field application expertise is unsurpassed in the natural gas industry which enables us to provide our Customers with the best service, advice and solutions to meet compliance and improve performance, efficiency and reliability.

All of our emissions testing technicians are factory-trained on the industry-leading ECOM portable emission analyzer and are experts in the ASTM and MSAPR testing protocols.



Spartan has the ability to use calculated or measured horsepower, depending on the test to be performed and Customer preference.

# IN THE RIGHT PLACE AT THE RIGHT TIME — SPARTAN HAS SERVICE WHERE YOU NEED IT

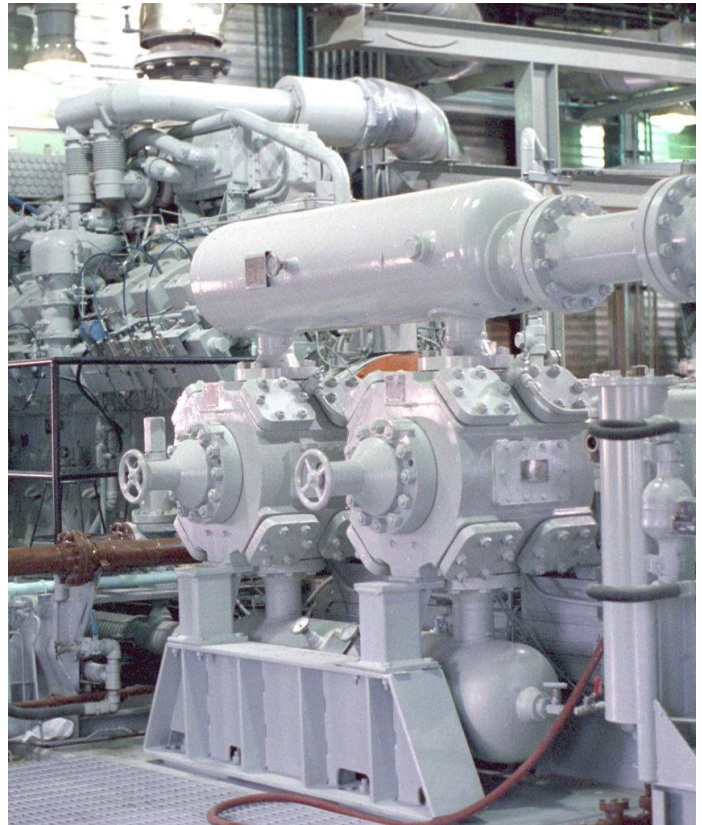
We provide performance and emission testing services from five of our offices — Calgary, Edmonton, Grande Prairie, Regina and Fort St. John — allowing us to keep travel costs to a minimum.

Our service technicians are experts in engine and compressor operations. This means that observed issues with engine tuning, cooling, fuel delivery, ignition, etc., along with exhaust emissions will be discussed while on site with site personnel, providing critical information for maintenance and operations.

## Additional On-Site Services

- AFR pre-audit
- Catalyst pre-audit
- Opportunity audit
- Catalyst health and efficiency check
- AFR tuning and ignition check

We offer factory-certified training, repair and calibration services for ECOM portable emissions analyzers at our Edmonton location.



# ROTATING AND RECIPROCATING SOLUTIONS — FULL BREADTH OF OFFERINGS



## **Project Support**

Engine fleet analysis using our proprietary MSAPR tool, proposals on NO<sub>x</sub> reduction technology and solutions, emissions testing, emissions testing training, portable emissions analyzers for MSAPR project/implementation management



## **Service Support**

Full suite of testing for MSAPR emissions, pre-audit, installation, commissioning and post-audit for technology upgrades, and 24/7 service and support after sales



## **Emission Testing and Documentation**

Reporting of results for MSAPR compliance or GHG offset credits, and emission analyzer calibration services



# MSAPR EMISSIONS TESTING TRAINING

## Learn how to use ECOM Portable Emissions Analyzers

Spartan has developed the only MSAPR emissions training program that combines combustion theory, MSAPR protocols and hands-on testing using the ECOM portable emission analyzer.

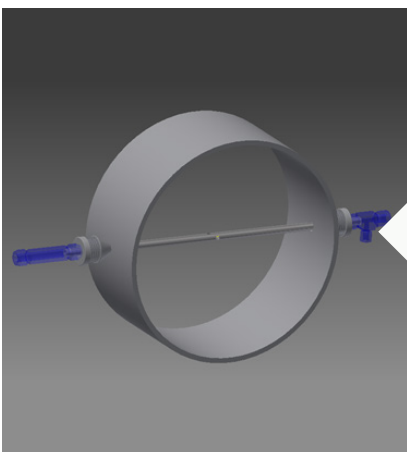
Emissions testing using today's advanced tools requires specialized training in order to properly determine the correct readings for emissions checks, performance testing, compliance reporting, engine tuning, or troubleshooting.

Students will also learn about emissions control strategies, rich and lean burn engine operation and the effect of external factors like fuel gas quality, ambient conditions and engine health on emissions.

Check the Spartan education calendar for a complete list of upcoming courses, locations and dates at [spartancontrols.com/education](https://spartancontrols.com/education)

### MSAPR Weld-less Emissions Sample Port

To facilitate emission testing, Spartan has developed a cost-effective, easy to install MSAPR compliant sampling port. This patent pending device allows for repeatable, accurate measurements of your emissions and has access ports for direct probe insertion or heated sample lines to allow for a more convenient/safe access point.



#### Advantages

- Standardized port configuration across fleet
- Accurate & consistent sampling location
- Easy installation with **no welding** required (drill 2 holes & install)
- Corrosion resistant all-stainless steel construction
- Spring-loaded design allows for thermal expansion
- Compressed air can be used to clear ash build-up from sample port holes
- Design is compatible with almost all exhaust pipe sizes (4-34")



# CATALYST LIFECYCLE SERVICES

## Catalyst Washing Services

A precious metal catalyst is a costly investment with long-term value. Like any piece of equipment, a catalytic system benefits from routine inspection and maintenance. Along with EmeraChem, the leading catalyst developer and manufacturer, Spartan offers complete catalyst lifecycle services to help you maximize the value of your investment. We can help you set up a catalyst monitoring program that includes performance testing, laboratory evaluations, washing and regeneration. At the end of its service life, we will recover the precious metal and apply it to your replacement EmeraChem catalyst.

## Catalyst Chemical Washing and Regenerations

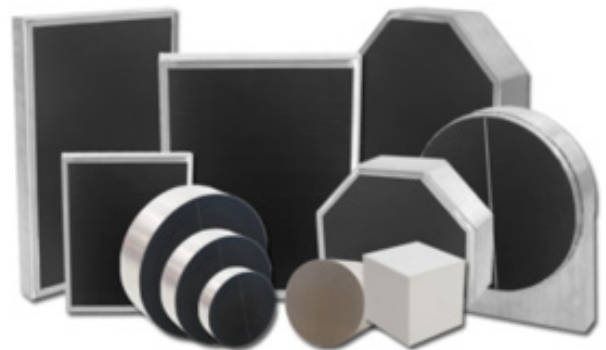
A combustion exhaust stream is not a pristine environment. Normal and abnormal engine operations expose the catalyst to chemical compounds that affect the catalyst's active compounds. These contaminants hinder catalyst performance through a number of mechanisms and cause catalyst performance to degrade over time. Rather than replacing the catalyst prematurely, chemical washing is used to remove these contaminants, regenerate the catalyst surface, and restore catalytic activity and performance.

Benefits of the catalyst washing process:

- Regenerates the catalyst to extend its active life
- Restores lost performance and efficiency to meet regulatory emissions requirements
- Decreases pressure drop to improve performance

## Precious Metal Recovery

A precious-metal catalyst retains an asset value throughout its life. When the catalyst reaches the end of its service life it can be processed to recover the precious metals. These precious metals can then be used to manufacture replacement catalyst or redeemed for credit toward the purchase of your next catalyst. EmeraChem's and Spartan's philosophy is that the precious metals on your catalyst belong to you, and you should get the maximum yield from the spent catalyst you give us for recovery.



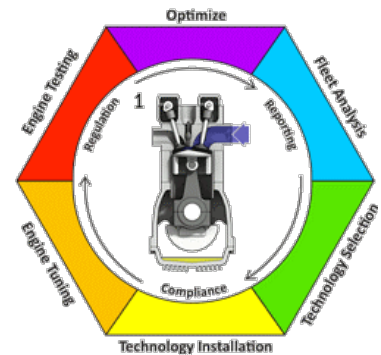
# MULTI-SECTOR AIR POLLUTANTS REGULATIONS

## Solutions to meet compliance

Are you running your engines or are your engines running you?  
Turn compliance into profit

Spartan offers solutions to meet MSAPR for the cement sector and two equipment types, gaseous-fuel-fired non-utility boilers and heaters.

An important part of an initial and on-going MSAPR compliance plan is specialized emission stack testing for boilers and heaters. Spartan has a wide range of emission testing services available using the MSAPR method protocols.



Spartan Controls can provide products, configuration and support to ensure your system is always running within the regulatory guidelines. Deviation alarms and generation of required reporting make submittals easy to review, customize and provide.



Reaction furnace (acid gas)



Standard HMI local control

# ADDITIONAL SERVICES FOR FIELD EQUIPMENT

## Supporting combustion applications and field appliances

With a full complement of products, technical support and experience, Spartan can help ensure regulatory compliance, productivity and performance. From data analysis to supporting MSAPR baseline submission reporting, we can support our Customers sites with technical, operational and environmental compliance.

Using EPA-7A techniques for gathering data, we can help identify and recommend solutions to ensure reductions and meet ppm standards for  $NO_x$  and CO while still optimizing fuel consumption and  $O_2$  trim strategies.

### Expertise

- *Full system support from 100,000 BTU/h to 100 million+ BTU/h*
- *Once-through steam generators (OTSG), heat recovery steam boiler (HRSB), boilers, reforming/cracking furnaces, cement kilns, process heaters, line heaters, sulfur furnaces*
- *Combined systems and product integration capabilities for compliance and optimization*
- *Natural and forced draft systems – single or multi-burner/multi-fuel designs*
- *Dedicated team of experts and best-in-class products for combustion solutions*

### Spartan Advantages

- Comprehensive knowledge of the **CSA B149.3** code requirements
- Proven project execution experience and process delivering code compliant solutions
- Strategic planning support for upgrades, lifecycle initiatives and administrative support
- Scalable scope – delivering complete solutions independently or as an integrated resource within our Customers' engineer teams, contributing to product design, sizing and best practices

**Call us or request a quote online 24/7**

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