



2018

Year End Report to Members

COMMENTS FROM CHAIR OF GMRC BOARD OF DIRECTORS



As 2018 has come to a close, GMRC is still going strong. The Gas Machinery Conference in Kansas City drew almost 1100 attendees and the research portfolio of over \$636,000 addressed the continuing-to-emerge issues of wet gas, dry gas seal damage and the accuracy of the current suite of Equations of State. The number of full and associate member companies had grown to 80 as 2018 ended and is already at 83 as of this writing – a testament to the practicality and viability of the GMRC organization. The research reserve balance continues to hover around \$3 million and \$650,000 in research is planned for 2019. GMRC remains financially strong.

In the current resurgence in the industry, companies continue to be cautious by staffing on the lean side and keeping non-capital budgets low. The outcome of this is that many companies think they do not have the time or budget for training. GMRC understands this perception and is working to create relevant training classes in formats and venues that allow easy, affordable access to all GMRC members. We all understand that our industry is currently light on mid-career individuals and heavy on late-career individuals. The loss of industry knowledge this can cause as more and more SME individuals retire, coupled with the scrutiny of our industry by the general public makes it even more important to give our industry professionals the proper training they need to be successful. You have heard me say it many times and I will repeat it here – The only thing worse than training your people and having them leave is not training them, and having them stay.

Three long-time members of the GMRC Board of Directors retired from the Board at the end of 2018. These individuals have volunteered their time over several years to help steer the GMRC organization to the continued success it currently enjoys. These individuals are Martin Habel of Solar Turbines, Doug Bird of Dresser-Rand/Siemens and Don York of Hoerbiger. Please join me in thanking these individuals for their service and dedication to the industry and to GMRC.

It has once again been a great honor to serve as the chairman of the GMRC organization. The excitement and energy of the Board and Committee volunteers is contagious and their commitment to the industry and the GMRC vision make for a very dynamic and fun (yes, fun) environment. You should join us. Become involved in GMRC and let your enthusiasm help make a difference in our industry.

Michael A. Smith, P.E.
Chair, GMRC Board of Directors

COMMENTS FROM GMRC PRESIDENT & CEO

The natural gas industry is in a much different place than it was just a few years ago. Natural gas prices are relatively low and they are very stable. This is due to the unprecedented level of domestic gas being produced by hydraulic fracturing in numerous shale basins across the country. One result of this new production is the need for new pipelines and new compressors to help move that gas efficiently to markets.



I'm proud to be associated with a research organization like GMRC that is focused on finding innovative solutions to the challenges that arise when an industry like ours is expanding and improving. It's gratifying to see talented and energetic professionals that are volunteering their time on the Project Supervisory Committee, the Gas Machinery Conference Planning Committee and the Board of Directors and working together to ensure that all aspects of our industry are safe, reliable and efficient.

Thank you for the opportunity and the honor of serving the GMRC and our industry.

A handwritten signature in cursive script that reads "William N. Cantrell". The ink is dark and the signature is fluid and legible.

William N. Cantrell
President & CEO
Gas Machinery Research Council

Your [Gas Machinery Research Council](#) enjoyed a successful year in 2018. This report provides a summary of 2018 and a look ahead to 2019.

OVERVIEW

- Annual operating budget: \$1.6 million
- Healthy reserve balance: \$3.4 million
- Invested \$3.5 million in research projects over the past 8 years

RESEARCH PROJECTS - 2018

GMRC invested \$636,375 in research projects during 2018, including:

- Direct Enthalpy Rise Measurement - Phase II
- Guideline for the Selection of Filtration Equipment - Phase II
- Wet Gas Formation and Carryover in Suction Equipment - Phase III
- Development of a Robust Scrubber Level Controls - Phase II
- Dry Gas Seal Reliability (co-funded with PRCI)
 - CFD Analysis of Liquid: in Dry Gas Seals
 - Liquid Contamination under Dry Gas Seals: Modelling & Testing
- Field Test Verification PAN Filter System

RESEARCH PROJECTS - 2019

GMRC approved \$625,000 in research projects for 2019, including:

- Dry Gas Seal Liquid Contamination Phase III
- GHG Impact of Compressor Driver
- Rod Packing Leakage Monitoring and Prevention
- Transient High Pressure Gas Dilution Study
- Dew Point Benchmarking of Equations of State
- Guidelines for the Selection of Filtration Equipment - Phase 3
- Reciprocating Compressor Cylinder Lubrication Optimization
- Field Site High Pressure Oil Sampling and Gas Dilution Measurements
- Direct Enthalpy Rise Gas Property Testing Phase III

Recent Research Projects GMRC and PRCI Co-Funded Programs:

- Portable Analyzer Lab Tests to Support Simplified Test Method
- Effect of Variability in Fuel on Operations and Reliability of Turbines
- Portable Analyzer Lab Tests to Support Simplified Test Method
- GHG Database to Support Emission Factor Improvement - "Methane Data and Super Emitters"
- Control of Fugitive Methane Emissions from Compressor Stations through Combustion of Compressor and Engine Crankcase Emissions
- Methane Reduction Data Analysis for 2-Stroke Lean Burn Natural Gas Engines
- Dry Gas Seal Reliability

TRAINING - 2018

GMRC invested in 4,776 people through 2015 - 2018 through the following programs:

- Applied Principles of Engines & Compressors
- Factors in Compressor Station Design
- High Speed Package Design
- Foundation Design & Repair
- Introduction to Gas Turbines and Centrifugal Compressors
- Compressor Station Vibration and the Impact on Performance, Cost & Reliability
- Combustion Characteristics
- Engine Analyzer & Reliability
- [Gas Machinery Conference](#)
 - Chairman: Greg Lortie, Ariel Corp.

MEMBERSHIP

- Operating Company Members: 20
- Engineering & Fabricating Members: 14
- Associate Members: 46

FINANCIAL SUMMARY

• Income	
○ Membership dues, research co-funding	\$375,667
○ Training (Net)	483,970
○ Other	<u>31,823</u>
○ Total	\$891,460
• Expenses	
○ Research Expenditures	\$ 636,376
○ Other	<u>151,623</u>
○ Total	\$ 787,998
• Deficiency of Income to Expenses	(171,753)
• Change in Investments	(78,332)
• Research Reserve	\$3,417,415

LEADERSHIP

2018 BOARD OF DIRECTORS

- Michael Smith, Centurian Pipeline, L.P. – Chair of the Board
- Kary Saleeby, ExxonMobil Production – Vice Chair of the Board
- Doug Bird, Dresser-Rand – Treasurer
- Quince Och, Enbridge – Secretary
- Martin Habel, Solar Turbines Incorporated
- Kriss McDonald, Ariel Corporation
- Don York, HOERBIGER Services
- Marlan Jarzombek, Atmos Energy
- Cary Watson, Enable Midstream Partners
- Don Crusan, L. A. Gates Company
- Scott Schubring, Williams – Project Supervisory Committee Chairman
- Orin Flanigan, Adobe Enterprises
- Craig Linn, Linn Energy Consulting
- William N. Cantrell, President & CEO, SGA
- Jane Butler, Vice President, GMRC
- Amanda Morgan, Director, SGA

2018 PROJECT SUPERVISORY COMMITTEE

- Scott Schubring, Williams – Chair
- Richard Fink, Enbridge
- David Krenek, Monico, Inc.
- Rainer Kurz, Solar Turbines Incorporated
- Clint Lingel, Ariel Corporation
- Christine Scrivner, Kinder Morgan
- Gary Bourn, Anadarko
- Scott Delmotte, Dresser-Rand
- Drake Millier, Atmos Energy
- Oscar Smith, EQT Gathering
- Jane Butler, Vice President, GMRC

2018 GAS MACHINERY CONFERENCE COMMITTEE

- Greg Lortie, Ariel Corp. - Chair
- Manny Angulo, The Williams Companies
- David J. Atwood, Siemens
- Bill Couch, PECO (Parker IPF)
- Michael Duffy, Advanced Gas Engine Solutions
- Brenna Geswein, Caterpillar
- Dwayne Hickman, ACI Services
- Rainer Kurz, Solar Turbines Incorporated
- Kenneth Langlois, DCP Midstream
- John Ladd, Hoerbiger
- Reagan Mayces, Enbridge
- Marybeth McBain, Kinder Morgan
- Keith W. Schafer, TransCanada
- Scott Schubring, The Williams Companies
- Sarah Simons, Southwest Research Institute
- Oscar Smith, EQT Gathering
- Jon Tice, DCP Midstream
- James Trent, Kinder Morgan
- Mary Beth Whitfield, The Williams Companies
- Jane Butler, Vice President, GMRC

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