Volume 17 Q2 2019

THE FINISH LINE

Positioned to Achieve Our Full Potential

"Our entire team is enthusiastic about the capabilities, shared values and resources that Cortec brings to RMS." - John Bartos, CEO

RMS News

Recapitalization of RMS Recent Events Recap

Tech Talk

Supply Chain Network One Big Axial The RMS Clean Room High Temperature Nitric Acid Expander Inlet Scroll Distortion OFS Compressor Uprate Houston Repair Facility Pulsation Attenuation

Spotlight On

New RMS Team Members Upcoming Events Career Opportunities





A Note from Dave Stewart, Vice President of Sales

Welcome back to "The Finish Line"! As many of you probably experienced as well, Q1 kicked off quickly for us and didn't stop moving. We're now half-way through the year, and we've accomplished a lot. We've brought on a whole host of new talent, adding to the wealth of knowledge within the RMS family. We also expanded our impeller repair and manufacturing capabilities at our Houston Repair Facility, allowing us to complete new fabrication or rerates of existing impeller designs for our customers.



The second half of the year promises to be just as exciting. We're currently preparing for the annual Turbomachinery & Pump Symposium in September and hope to see some familiar faces there. You can also find us at the Gas Machinery Research Council later in the month. As always, we'll be focusing on ways to refine our supply chain and expand our capabilities to serve you—our customers—to make your job easier, safer, and more profitable.

Here's to a busy H2!

Dave l. Sto

Dave Stewart





Recapitalization of Rotating Machinery Services

John Bartos, CEO

On June 10, 2019, RMS completed a recapitalization of the business with Cortec Group, a New Yorkbased investment firm that has been in business for over 30 years and has a long-standing and successful track-record of helping high-growth businesses expand and achieve their full potential.



Cortec is an ideal partner for RMS. During the transaction process, Cortec demonstrated that it understood our business model, embraced our culture and brought relevant experience to the table. This was very important to us. Our entire team is enthusiastic about the capabilities, shared values and resources that Cortec brings to RMS. They also happen to be a great group of people that I know you are going to enjoy meeting and working with.

We wish to thank our former backers, Incline Equity Partners, for their support since 2015. Incline was the first institutional partner for RMS. They did a great job of pushing the Company forward while maintaining the legacy and values that were important components to our success in the market.



About Cortec

Founded in 1984, Cortec invests in high value-added, middle-market specialty products, service, consumer, healthcare and distribution businesses in partnership with owners and management teams who want to drive growth and improve business fundamentals.

Additional information about Cortec can be found at <u>cortecgroup.com</u>.

2019 Syngas Conference Review

Nick Schneider, Regional Sales Manager

In March, RMS attended the 2019 Syngas Conference in The Woodlands, Texas. Syngas is a uniquely valuable event that has sufficient scale to bring industry-wide involvement yet maintains the concentrated focus necessary to enable productive collaboration amongst producers and suppliers alike. Daily breakout sessions on critical topics allow open discussions where key personnel across varied functions share experience that will lead to mutually increased productivity, reliability, and safety.

Attending and exhibiting at Syngas is a small part of an ongoing commitment to understanding the daily needs of customers in the fertilizer and other related industries, and how those needs can be met by the unmatched engineering expertise at RMS.



MARCH 11, 12, 13 - 2019

2019 PRT Roundtable

Don Shafer, Director, FCC Expander Engineering

RMS was pleased to present our 7th Power Recovery Train (PRT) Roundtable on May 21-22. We were able to move the venue to the Historic Hotel Bethlehem to allow for an upgrade in meeting rooms and atmosphere; a change that was very well received.

During presentations over the two days, presenters covered all aspects

of PRT design, reliability operation and lessons learned. Some of the key topics of discussion were: FCC Expander Design, Axial Compressor Design, Expander Deposition and Erosion, Online Monitoring, Structural Analysis, Rotor Dynamics and Field Service/Outage Planning. A tour of the RMS shop was also given on the last day to highlight our shop and all the new capabilities and upgrades.

The majority of attendees were PRT end users/machinery engineers who shared valuable first-hand experience on field problems and issues that affect them at their sites. This type of interaction with the end users helps improve RMS's ability to provide more reliable PRT equipment and makes us all better machinery designers and operators.

The RMS team would like to thank all of the attendees, presenters and RMS staff for making our 7th year of the PRT Roundtable a huge success. Based on the continued requests and positive responses from the attendees, RMS plans to continue to hold the PRT Roundtables annually. Look for the 2020 dates in future newsletters!







RMS Supply Chain Network

Frank Marrone, Director – Materials & Facility Services

A key element of fulfilling our customer's contracts with the highest quality products, at a competitive price, is our supply chain.

One of the aspects that makes us different than others is our longstanding relationships with our key suppliers. Many of our buying staff have been working with these same suppliers for more than 30 years. RMS engineering and sourcing continually looks for new technology and better ways to manufacture complicated products. With our vast supply base comes increased capacity and capabilities. Much of the success comes from the collaborative culture we foster. We involve our suppliers early on in the process of quoting jobs and develop strategies with our engineering team creating a method where manufacturing will be streamlined to meet technical processes. This helps greatly in reducing lead-time and ensuring manufacturability the first time.

Success comes from the collaborative culture we foster

Another area where RMS gains priority with our supply chain is by providing favorable commercial arrangements that motivate suppliers to complete work in a timely fashion. Unlike other large OEM's we are fortunate to have an agile finance team that makes these terms an attractive option for the sourcing team. Providing favorable payment options also has been a strategy to obtain lower costs from our suppliers, which reduces the cost for our customers with competitive offerings and reduced lead-times.

As a service and manufacturing business, getting custom-engineered products quickly is important to our customers. RMS leans heavily on our supplier's time and time again to find ways to reduce lead-time. We treat our suppliers with respect as they are partners in making our organization successful. Working closely with our suppliers, strengthening relationships, and developing better methods is one of the indirect ways RMS brings value to our customers.



rotatingmachinery.com

One Big Axial

Behzad Abdollahi, Design Engineer III and Chot Smith, Director of Bus. Dev. Operations & Field Service







In October 2018, RMS performed a turn-around for an FCC unit main air blower (axial compressor) of a major US refinery. This Allis-Chalmers compressor operates as a part of a Power Recovery Train and is rated for 203,000 ACFM. To put it in perspective, this compressor can change out the air inside the New Orleans Superdome football stadium in about 10 hours.

These units are typically turned around on-site, but due to the heavy corrosion on the inlet casing it was decided to perform the work in RMS Houston facility. This would enable RMS to abrasive blast the compressor casing and coat it with heat-resistant paint to prevent further deterioration.

The compressor weighs more than 110,000 lbs., which requires special permits and provisions for transportation. Additionally, the inlet is located on the lower half of the casing, which means the horizontal split line is about 9 feet above ground level. Prior to receiving the compressor, RMS made provisions for a suitable scaffolding to ensure workers' safety and efficiency.

The turnaround was scheduled to be completed in two weeks, with 24/7 coverage. The crew were supervised by RMS field service specialists and a design engineer. The spares had not been overhauled by RMS, so the history was not fully known at the time, and as is common with any turnaround, there were a few unexpected discoveries. However, being in the RMS shop proved advantageous due to additional capabilities to inspect, weld repair, fabricate, and machine parts as needed.

One of the highlights of the turnaround was discovering that some of the clearances between the overhauled rotor to the stator casing were less than specifications. Communications between RMS engineering and the customer representatives led to a decision to tip grind the blades, and high-speed balance the rotor (again). With efficient planning and implementation, only two additional days were added to the schedule.

The compressor left RMS facility on-schedule, looking brand new, and has been successfully in operation since. The spent (old) rotor and stator assemblies are currently at RMS Bethlehem location to undergo inspections and design upgrades. The typical design upgrades for these type machines increases their reliability, maintainability, and manufacturing accuracy.





RMS Clean Room

Rob King, Senior Design Engineer

When rotating equipment is overhauled, cleaning of all the parts is a typical step in the process to facilitate inspection and preparation for reassembly, so that the equipment is returned free from oil, grease, and debris. However, due to safety concerns associated with unique processes, some machinery applications require a much more rigorous level of cleanliness, necessitating the use of a "clean room."

A clean room is a purpose-built dedicated clean working area, isolated from the typical machine shop/assembly floor environment. Access doors for the clean room have seals to minimize air exchange with shop, and are kept closed as much as possible. An overhead crane located within the room is a necessity for performing maintenance on larger sized equipment. A dedicated air-handling unit for temperature and humidity control, with separate outside air exchanges is also needed to keep the environment within the clean room free from typical oil/hydrocarbon vapors that tend to be present in shop environments. In order to minimize rusting of clean carbon steel components, humidity must be controlled as well.



Humidity control is also important when servicing machinery that utilizes seal inserts made from materials such as Flouroscint, as these materials will absorb moisture and swell in high humidity conditions, causing dimensional changes to the parts.

Two examples of machinery applications that require the use of clean rooms are for equipment in oxygen service, and chlorine service. Chlorine compressors have been part of the RMS AC-Compressor fleet for over 50 years. Chlorine gas can react with hydrocarbon oils and greases, and in certain conditions, can be explosive. Additionally, chlorine gas will support combustion if ignition is triggered, potentially causing dangerous equipment fires. During chlorine compressor overhauls, extra precautions are applied throughout manufacturing process to reduce/ eliminate contact with hydrocarbons, and the use of a clean room for compressor assembly is the final step for ensuring the necessary level of cleanliness. The clean room provides the right conditions for final part cleaning and verification using black light inspections for any trace hydrocarbons. If trace amounts of oils or greases are found, parts can be cleaned within the room using appropriate cleaners. Once parts are validated clean, the room environment eliminates risk of further contamination as the remainder of assembly is completed. When final compressor assembly is complete, a nitrogen gas purge is typically applied to equipment to ensure the clean gas environment is maintained within during storage.

High Temperature Nitric Acid Expander Inlet Scroll Distortion

Sydney Gross, Director – Steam Turbine Engineering

High temperature expanders in nitric acid power recovery service are specialized pieces of equipment designed for the particular service. They receive tail gas from the process in the temperature range of 1100°F to 1350°F at pressures from 60 psi to 250 psi. Most discharge at a pressure just above atmospheric. Because shutting down the process is necessary to change the catalytic gauze in the ammonia burner several times a year, the expander is cycled up and down frequently between operating temperature and ambient.

In order to shield the outer casing from the gas temperatures, the expander is designed with inner casings. The inlet casing is commonly referred to as the scroll because it is usually a complex toroid shape. The scroll is intended to direct and distribute the flow of gas from the inlet flange into the first stator which is often attached to the scroll. The scroll is not designed to be a pressure containing element so it is manufactured from relatively thin stainless steel or nickel alloy material as a spinning and/or fabrication. Large variations in thickness are avoided to reduce thermally induced stresses.



Disassembly of I-R Nitric Acid Expander

Scroll Removed from Outer Casing

The combination of these factors results in large differences in thermal growth between the inner and outer casings. With the tight operating clearances of nitric acid expanders, it is imperative to maintain alignment between rotating and stationary components from cold assembly conditions to hot operating conditions. For the scroll to casing this may be accomplished with radial pins and keys between inner and outer parts. These keys and pins allow the hot scroll to expand without restriction while maintaining relative position to the rotor. In theory.

In practice, these alignment features frequently bind due to misalignment, tight clearances, component distortion, corrosion, etc. and prevent the scroll from freely expanding resulting in distortion and cracking of the scroll and affecting alignment to the rotor.





Binding can occur relatively quickly during the operating cycle depending on the severity of the cause. The cracking is sometimes exacerbated by embrittlement of the material from thermal aging. Because this is a common problem, time during the overhaul should be allowed for repair of the scroll.



Scroll Distortion from Keyed Support Foot



Scroll Cracking from Keyed Support Foot

Repair often includes removal of the old key feet and pin bosses and patching in new or repaired parts. Reinforcing the shell of the scroll in the area of the attachment has been effective in preventing excessive distortion as well. Casings that have experienced embrittlement can often be rejuvenated through a solution anneal heat treatment. Embrittled material can be impossible to weld because cracks will propagate from the heat affected zone so solution treatment should be done first. Aside from welding difficulties, embrittlement can be identified through metallurgical analysis. The thin wall construction of the scroll makes bracing during heat treatment critical in preventing and correcting distortion. Remachining of the feet and nozzle fit will be necessary after weld repair.



Scroll in Oven for Solution Anneal Treatment



Assembly of Repaired Scroll with Reinforced Features

Prevention of in-service distortion is not always possible. However, by ensuring adequate design clearances, using appropriate materials and designs in the alignment features and aligning the scroll correctly, damage and distortion can be minimized.

Oil-Free Screw Compressor Uprate for Increased Flow

Adam Hernandez, Product Manager – Oil-Free Screw Compressors

Many of our customers are surprised to hear that RMS can offer them a significant flow increase to their existing Oil-Free Screw compressor without any change in operating speed. The solution requires only a minimal increase in power, while optimizing the efficiency of the compressor. If your existing Oil-Free Screw compressor has a symmetric rotor design, then this upgrade is your best solution to increase capacity while minimizing your investment.

We developed this upgrade using state-of-the-art aerodynamic and manufacturing technology to meet the evergrowing need for flow capacity. Depending on the process and application, efficiency improvements are typically expected to yield at least 8% more flow with only a 3%-4% increase in power. Actual results may be as much as 30% flow increase compared to current operating conditions.

Rotating Elements

The legacy design of the AC Compressor Oil-Free Screw compressor included rotors with a symmetrical lobe profile. By upgrading these rotors to the latest asymmetrical lobe profile, the compressor performance can be improved with no change in compressor speed. This latest generation asymmetric design includes a larger swept flow through each lobe along with tighter clearances, which provides increased volumetric flow more efficient gas compression with each compressor revolution.

Casing

This upgrade requires only minor casing modifications the next time the rotors are replaced. Casing rotor bores are re-machined and enlarged to fit the new rotor designs. In the process, casings are restored to the proper design clearances with improved surface finish. Additionally, the discharge porting is modified to match the upgraded discharge profile of the new rotors. As an alternative to modification, complete new casings may be provided. This approach is recommended for severe service applications, compressors near the end of service life, or simply to minimize compressor downtime.







Any existing AC Compressor Oil-Free Screw compressor design with symmetric rotors may be upgraded, including the following nameplates that fall under RMS: Beloit Power Systems, Fairbanks Morse, Louis Allis, and GE Oil & Gas / Baker Hughes.

Our successful experience includes the following examples:

Chemical Plant Upgrade, USA Flow increase: 8% Scope of supply: New rotating elements, casing upgrade, no driver modification required

Styrene Monomer Upgrade, USA Flow increase: 20% Scope of supply: New rotating elements, casing upgrade, gear internals for speed increase, no modifications required for existing steam turbine

driver

Houston Repair Facility

Robert Tabb, General Manager – Houston Manufacturing Service Center





Impeller Repair and Manufacturing

The Houston Repair Facility has become our center of excellence for the manufacture and repair of both open and closed face impellers. Our primary goal is to better support our legacy AC Compressor equipment and at the same time support the growth of RMS Centrifugal Compressor fleet.

In Q1 2019, we installed our blade press and furnace to facilitate the configuring of raw blade stock into engineered blade designs utilized in the fabrication of open face impellers. Our welding area has expanded to include the personnel, fixturing, and welding equipment needed to perform weld procedures specific to the fabrication of both open and closed faced impeller designs. We also installed an impeller spin pit to test the impellers above operating conditions. These changes allow the Houston facility to not only produce new impellers, but also provide repair options for customers and their original equipment.

Further to our impeller business, the Houston Repair Facility offers machining capabilities, blade frequency tuning, overspeed qualification of impellers, and a variety of balance machines to complete the process. Our Engineering team offers decades of expertise in all aspects of designing and rerating impellers for specific customer applications. We offer FEA and rotor dynamic studies to ensure the performance of individual components and assembled rotors throughout the process, whether new fabrication or rerates of existing designs.







Rapid Response Capabilities

The RMS Houston Manufacturing Service Center (67,000 sq.ft.) has over 45 years in providing 24/7 emergency repairs to critical rotating equipment for our Gulf Coast customer base. Our capabilities allow us to conduct emergency repairs with virtually all operations staying "Under One Roof." From disassembly and full inspection, reverse engineering, welding, machining, OD and ID grinding, HVOF coatings, dynamical balancing, full assembly and testing, our facility offers the quick response needed to keep our customers operational.

RMS Houston Manufacturing Service Center offers emergency services to all types and name plates for equipment from:

- Compressors Centrifugal and Screw
- Pumps All types and configurations
- Steam Turbines All makes and sizes
- Sundyne Products Gearboxes, Pumps, and Compressors
- Liquid Ring Compressors All Brands, Including Garo
- Gearboxes High speed and low speed
- Blowers -Lobe and Centrifugal
- Complete Machine Shop, Welding, Dynamic Balancing, Blasting, and Coatings
- 50 Ton Crane Capacity







Pulsation Attenuation - A solution that is more than just noise

Jeff Lovelady, Engineering Fellow

Oil Free Screw (OFS) compressors are very effective at providing a means for gas compression in many process gas applications. Pulsation attenuation devices are placed at or near the inlet and discharge flanges of the compressor. These devices are intended to protect the upstream and downstream equipment from dynamic gas pulsations produced by the periodic opening of the screw threads. The term *silencer* has often been applied to these in-line devices, but it is really a misnomer in that the noise attenuation is a secondary function.



Reactive Pulsation Attenuator (courtesy of Dürr Universal, Inc.)

There are two types of attenuation devices that are applied in industrial service pulsation attenuators, reactive and absorptive.

Absorptive silencers are effective over wide frequency ranges but can be susceptible to breakdown of the absorptive material and are not used for pulsation attenuation.

The reactive type is commonly found in screw or reciprocating compressor applications. Pulsations that are produced from screw compressors have pressure levels that are the equivalent of sound levels in excess of 150 dB. These pulsations occur at very discrete frequencies that are at multiples of the lobe pocket passing frequency. **Pulsation attenuators** are designed to reduce these pulsations by passing the flow through internal components that are tuned to dampen these frequencies.



The primary containment of this tube arrangement is a pressure vessel built to ASME code requirements. This pressure vessel is then wrapped with a packing material or blanket that provides some ambient noise attenuation. A secondary shell is then applied to protect the packing layer. It is important that this shell is not in direct contact with the primary pressure vessel. Any contact can lead to vessel vibrations being transmitted to the shell and then directly transmitted to the atmosphere effectively compromising the intended purpose of the external lagging. One drawback to the external shell is that it makes inspection of the pressure vessel problematic and steps should be taken in operations and maintenance plans to inspect these vessels on a regular basis.

Most manufacturers recommend inspection of the vessel every five years and some recommend replacement after 25 years of service. The inspection of the pulsation dampener can be carried out through inspection openings in each chamber of the vessel. Internal components should be checked as well as the wall of the pressure containment. The internal components are subjected to high pulsating loads and are subject to high frequency fatigue failure.

RMS works with qualified ASME inspectors to inspect pulsation attenuators on site. These inspections are done under the guidance of RMS Field Service Engineers to make sure that all features of the device are examined. RMS is committed to servicing pulsation attenuators and providing our clients with the engineering services needed to solve pulsation induced problems.



The RMS Family Grows

Please join us in welcoming the newest RMS team members!

Matt Miller • Director of Houston Operations

Matt joins us from Mitsubishi Heavy Industries Compressor Division where he was their Pearland Operations Manager. He's worked for 20+ years at AC-Compressor and GE Oil & Gas in various roles. He holds a Bachelor of Science in Physics from University of Wisconsin - Madison.

Jeff Lovelady • Engineering Fellow

Jeff joins RMS with 25 years+ of experience in rotating equipment design, engineering management, and field service. He is an alumni of the AC Compressor Appleton team where he played a major role in developing the OFS line we have today.

Andrew "Drew" Dunn • HR Manager

Drew brings with him 13+ years of HR experience and a solid background in recruitment, employee relations, performance management, benefits, general human resources administration and management of personnel. He holds an MBA from the University of Tennessee

Andy Furman • Senior Application Engineer

Andy joins RMS from Plexus Corporation. Before that he worked for AC Compressor and Exterran conducting second and third party witness inspections. He has 10+ years of experience with rotating equipment and recip compressors.

Maury Henrichsen • Principal Engineer

Maury returns to RMS with decades of experience in rotating equipment design and field service. Maury has previously held positions in CONMEC, AC Compressor, Linde, Air Liquide, RMS, and other companies.

Gary O'Connell • Principal Engineer

Gary comes to us with 24+ years of experience at AC-Compressor/GE Oil & Gas having held several roles including Senior Systems Engineer and Project Engineer.

Mary Asuagbor • Market Data Analyst

Mary previously worked for IIR as a Regional Specialist for 21 years. Mary earned a Masters Environmental Policy & Management from the University of Denver after her BS in Environmental Science.

Ken David • Shop Supervisor – RMS Houston Manufacturing Service Center

Ken brings a wide range of rotating equipment experience having worked for Stewart & Stevenson, Rolls Royce, Sulzer Hickham, and most recently with Praxair NAIG.

Eli Lopez • Shop Supervisor

Eli comes to us from Lehigh Heavy Forge where he held the position of Machine Shop Supervisor/Programmer.

Thomas Devlin • Project Manager

Thomas comes to us with almost 10 years of Project Management experience for Cameron/Schlumberger and Cotton Global Disaster Solutions.

Alex Pierce • Commercial Specialist

Alex has 5 years of experience in customer support, research, and technology. During her career she has worked in customer service, software support and testing, and online research.

Marci Moran • Contracts Manager

Marci joins RMS with many years' experience working in contracts, insurance and customer service. She has worked for Cemtek KVB-Enertec, Babcock & Wilcox Company and Yarway Corporation.

Willie Smith • Utility Worker

Willie joins us from Aerotek and his main responsibilities will be in the shipping and receiving areas.



Please join us in congratulating the following RMS team members who were recently promoted.

Don Shafer • Director, FCC Expander Engineering

In this role, Don will lead all aspects of the expander business including business planning, new order support, engineering execution, shop support, and field support.

Eric Grissom • Operations Manager – RMS Houston Manufacturing Service Center

Eric came to us with over 12 years of experience in the turbomachinery industry having worked for AC Compressor, Kaeser Compressor, GE Oil & Gas and Mitsubishi Heavy Industries.

David Morehouse • Director of Commercial Services

David will lead the team of Commercial employees in Appleton, Bethlehem and Houston, responsible for assuring effective in scope, cost and commercial conditions for customer proposals.

Bo Schaller • Principal Application Engineer

Bo will be responsible for the application engineering, commercial and legal contracts primarily for the multi-OEM Centrifugal Compressors Rerates, repairs and upgrades as well as the full range of RMS products as necessary.

Behzad Abdollahi • Lead Engineer

Behzad has done an outstanding job in his first year at RMS and we all look forward to him continuing his efforts to design the perfect replacement for an AC axial compressor.

Gabrielle "Gabby" Cray • HR Generalist

Gabby's role will expand to include benefits administration, claims resolution and change reporting, policy and procedure implementation, and workmans comp claims.

Joe Kovacs • Logistics Manager

In this new role, Joe will be responsible for all shipping and receiving.

Michael Fernandez • Logistics Coordinator

Michael has been with RMS since October 2017 in the Houston Manufacturing Center and is essential in all local and domestic shipping and receiving operations.

Jerry Balderas, Jr. • Lead Welder

Jerry has been with RMS since December 2012 in the Houston Manufacturing Center and has been essential in day to day operations of the weld shop at RMS South.

Upcoming Events



Turbomachinery & Pump Symposia

September 10-12, 2019 George R. Brown Convention Center • Houston, TX More details: tps.tamu.edu

Join our team! We'll be doing in-person interviews at the booth.

Visit us at Booth 2041

TPS is a vital industry event, offering a forum for the exchange of ideas between rotating equipment engineers and technicians worldwide. Now surpassing 47 years, TPS is known for its impact on turbomachinery, pump, oil & gas, petrochemical, power, aerospace, chemical and water industries.

The TPS technical program is hand-selected by advisory committees made up of key industry players, and led by highly respected practitioners and leaders in their fields. Topics cover maintenance, reliability, troubleshooting, instruction on emerging designs, technology, and best practices that include case studies with real-world relevance on problems solved and lessons learned.

The Turbomachinery Symposium is embarking on 48 years, and the Pump Symposium on 35 years. Several leaders, authors and advisers of the technical program have been with TPS since its inception in 1972, or very close to it.



Gas Machinery Research Council

September 29 - October 2, 2019 Henry B. Gonzalez Convention Center • San Antonio, TX *More details: <u>gmrc.org</u>*

Today, with over 70 member companies, GMRC continues to lead the industry in advanced research and education opportunities. Our extensive resource library contains a wealth of technical knowledge and our annual Gas Machinery Conference is one of the industry's premier events.

GMRC was founded in response to the rapid expansion of natural gas pipeline facilities in the US following World War II. The inflation of pipeline production resulted in the construction of thousands of compressor stations, allowing natural gas to flow quickly and smoothly through the pipelines.

However, due to limited knowledge and technology used in their design, the compressor stations didn't live up to their expectations. Further research was needed to improve the quality and efficiency of the pipeline facilities and gas compressor stations. As a result, GMRC was established in 1952 to support the continual research of gas compression and related equipment.





Join the RMS Team!

We currently have the following positions open at RMS.

Bethlehem, PA and Houston, TX

Project Manager Machinist

Mechanic

Houston, TX

- Buyer/Purchasing Coordinator
 - Applications Engineer
 - Applications Englise
 Marketing Specialist

Bethlehem, PA

- Rotor Assembly Technician 2nd Shift
- Senior Structural Analyst
- Network Administrator

We'll be performing in-person interviews at TPS 2019 - Booth 2041!









Exclusive Source for Axial, Centrifugal & Oil Free Screw **Compressors, Parts & Service** Compressor CONN

Our range of product and services includes:

Axial Compressors • Centrifugal Compressors Gas Turbines • Steam Turbines • Power Turbines FCC Expanders • Nitric Acid Expanders • Oil Free Screws

- **Field Services**
- Analytical Evaluations
- **Dynamic Balancing**
- Machinery Installation, Redesign, Repair, Commissioning, Overhaul, and Rerates
- **Reverse Engineering**
- Third-Party Inspection
- Consulting
- Orphan Equipment
- Labor and Labor Supervision
- Spare Assemblies and Components •
- **Remaining Life Assessments**
- **Design Engineering**
- Surplus Equipment Rejuvenation

We provide the turbomachinery support and expertise you are looking for.

Corporate & Appleton Engineering Offices 484-821-0702

Parts Inquiries RMS@rotatingmachinery.com

Appleton, WI Sales Office Andy Jansen 920-460-3811 ajansen@rotatingmachinery.com

Tennessee Sales Office

Mike Spangler 484-896-8438 mspangler@rotatingmachinery.com

Florida Sales Office

Jonathan Calhoun 404-372-6936 jcalhoun@rotatingmachinery.com

International Sales Will Febres 713-471-7539 wfebres@rotatingmachinery.com

Houston Sales Office David Stewart 346-274-8590 dstewart@rotatingmachinery.com

Kurt Diekroeger 713-898-1015 kdiekroeger@rotatingmachinery.com

James Lucas 346-237-1850 jlucas@rotatingmachinery.com

Nick Schneider 713-380-9605 nschneider@rotatingmachinery.com