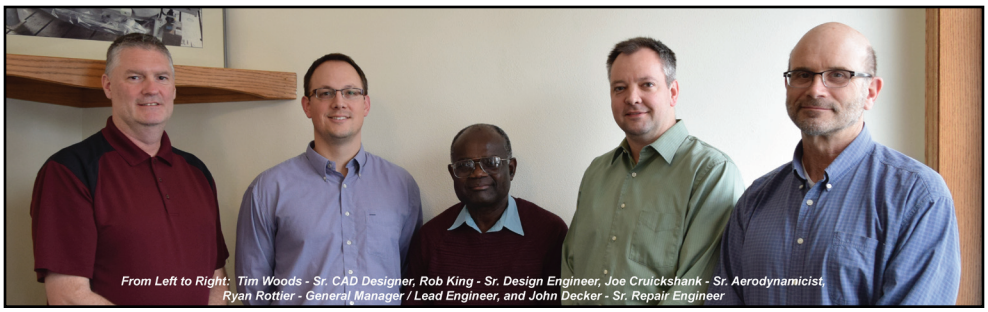
RMS
Rotating Machinery Services, Inc.

The Finish Line

VOLUME 12 ISSUE 1 JANUARY - APRIL, 2016

APPLETON, WI COMPRESSOR OFFICE OPENS



From Left to Right: Tim Woods - Sr. CAD Designer, Rob King - Sr. Design Engineer, Joe Cruickshank - Sr. Aerodynamicist, Ryan Rottier - General Manager / Lead Engineer, and John Decker - Sr. Repair Engineer

We are pleased to announce the opening of our Appleton, Wisconsin Office. The office opened its doors on February 15, 2016.

In addition to providing the full range of aftermarket turbomachinery services, the office specializes in aftermarket services for the ex-A-C Compressor line of centrifugal compressors.

This highly-experienced group of engineers and technicians has extensive experience with the former A-C Compressor product line; specifically, A-C Compressor mechanical design, performance, aerodynamic, and service experience. With their strong OEM background, the group provides a level of skill that is missing in the current marketplace.

Ryan Rottier, General Manager, said, "*We have put together a strong group that customers will immediately recognize as the go-to team for their aftermarket A-C Compressor needs.*"

Our team in the Appleton office has an average of 20+ years experience. You can reach our A-C Compressor experts at 484-821-0702.

RMS SHOP OPERATIONS

By Charles "Chot" Smith

RMS shop operations most recent addition to our "in house" capabilities is a large state of the art abrasive blast cleaning room. The addition of this equipment allows us to keep all abrasive cleaning of customer supplied equipment at our facility which will allow us to better control our schedule and eliminate the risk associated with shipping this work to an outside source.

Inside Report

Rotating Machinery Services, Inc. *2760 Baglyos Circle, Bethlehem, PA 18020*

Phone: 484-821-0702 Fax: 484-821-0710 www.RotatingMachinery.com

LETTER FROM GENERAL MANAGER

By Dirk Paraschos

Dear Friends,

We would like to express our sincere gratitude for your patronage and continued support. As we continue to grow we are determined and committed to providing you the best quality service for all of your rotating equipment needs. We are continuously evaluating better means in which to support you, our customer, and at the same time make RMS a better and safer place to work for our employees.

As part of our goal to better serve you we have opened a branch office in Appleton, Wisconsin. This office is staffed with accomplished centrifugal compressor engineers and draftsmen. This group specializes in AC Compressors which allows us to support a greater variety of rotating equipment and strengthens our core engineering group.

In our Bethlehem facility we have recently purchased and installed a 24 'x 14' blast booth. The blast booth will shorten cycle times during inspections, fabrication & machining processes. The blast booth will allow us to better service turnarounds and emergencies.

In our continued efforts to help keep our shop a safe place to work, we have contracted a third party to perform an Industrial Hygiene Report. We are now in the process of implementing recommendations noted in the Industrial Hygiene Report.

At RMS, we strive to create a positive working environment. The mutual development and progress of the company and individual employees are both important and we encourage everyone to display their talents to their fullest potential.

We firmly believe the company's development and progress is critical to our success in being able to offer a superior quality outcome of each and every project. RMS will continue to be unequalled in our level of customer support.

Again, we thank you for allowing us to be a part of your company's ongoing success.

CONGRATULATIONS - JOAN BERG, PMP

On March 26th Joan passed her PMP certification exam. Project Management Professional (PMP) is an industry certification for project managers. It is globally recognized and demonstrates that the project manager has the experience, education and competency to lead and direct projects.

In order to sit for the exam a project manager must have a four year degree with 4500 hours (7500 hours if no degree) leading and directing projects and 35 hours or project management education. Joan easily met the degree and experience requirements. Joan holds a Mechanical Engineering Degree and a Master's in Business Administration and has over 3 years of experience at RMS in addition to her many years of experience at 3 Fortune 500 companies.

In order to qualify for the project management education, Joan completed a Project Management Certificate program at Penn State University – Lehigh Valley Campus. The 6 month course ended this past February. Joan says she really enjoyed the experience at Penn State. She was able to interact with many Project Managers from businesses across the Lehigh Valley. Joan said she spent the month of March prepping for the exam and taking practice test after practice test to prepare. She is very happy that she accomplished her goal of becoming a PMP and looks forward to sharing the knowledge, skills, tools and techniques that she learned during the certification process.

TECH TALK

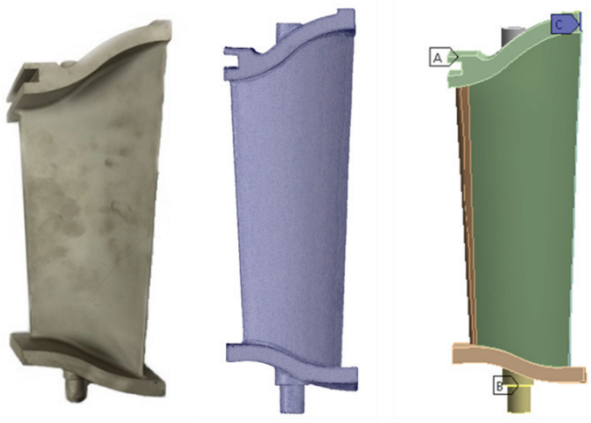
REMAINING LIFE ANALYSIS HIGHLIGHTS FROM 2015

By Christopher Sykora

One of the most in-depth projects for the analytical design team at RMS is the Remaining Life Assessment (RLA). When it was all said and done, we accomplished four such projects in 2015 and are already wrapping up another in early 2016. An RLA is used to find out if parts (rotor disk, blades, etc.) can be operated for an extended period of time beyond the originally estimated lifespan. It consists of visual inspections, non-destructive testing, metallurgical evaluations, and a thermal/stress analysis of the part in question. The RLA does not "extend" the life of the component, but rather calculates an updated life expectancy of the equipment given the actual operating conditions and utilizing the most modern analysis techniques. The new techniques are often more precise and thus can usually afford to be less conservative than the original analysis that may have been completed before the advent of finite elements. The intention of this article is to highlight the stress analyses from the RLA's performed at RMS in 2015.

The first RLA in 2015 was performed on a CrMoV alloy steel GT-51 power turbine disk. Although the end user of this disk was unable to provide much operating data on their rotor, RMS was able to perform this analysis based on typical GT-51 operating information from our archives. Although not usually the case for most legacy disks designed with the conservative techniques from several decades ago, the results for this particular disk showed a very low calculated number of cycles to crack initiation. In fact the calculation (including typical safety factors) was a few hundred stop-start cycles short of the estimate of cycles already run. The non-destructive testing did not find any detectable crack indications, so the extra step of a fracture mechanics analysis was taken for this disk. This provided an estimate of the minimum inspection intervals required to detect cracks using a red dye inspection in the field, before those cracks grow to a critical size where fracture would be imminent. This rotor has already been placed back into service is expected to operate for several more years.

The next RLA was performed on the first two of five stages from an E-526 nitric acid expander. Disks made of both A-286 and 422 stainless steel were analyzed. Results for this project were more typical in that the minimum cycles to crack initiation were estimated at several thousand, significantly longer than the operation anticipated in the future. Time to creep rupture was also calculated, but was not limiting either. This job demonstrated our ability to analyze multi-stage systems with multiple sources of cooling flow.



RT-65 Stator Vane
Laser Scan vs. Analysis Model

The third RLA of 2015 was performed on an RT-65 power turbine disk made of 422 stainless steel and the accompanying stator vane made of cast 310 stainless steel. The disk, rotor blade, and stator vane were all provided for reverse engineering since RMS did not have any geometry of this particular rotor. All three components were turned into 3-D solid models for analysis utilizing our in-house digital measurement systems (including laser scans) and 3-D solid modeling capabilities (see image). The analysis at existing operating conditions of these component also showed significant remaining life and opportunity for extended run time even though this rotor had already been in operation for ~180,000 hours. This particular user also requested additional analysis beyond the typical RLA, to explore the possibility of running at hotter operating conditions in order to increase horsepower output. This required multiple analyses at hotter conditions & techniques to calculate life expectancy including cyclic damage already incurred from past operations. RMS was up to the challenge!

The final RLA of 2015 was for an FCC hot gas expander Waspaloy disk and 347 stainless steel nosecone / inlet struts. RMS was able to very quickly turn around the analysis on this disk since we have established a

REMAINING LIFE ANALYSIS HIGHLIGHTS FROM 2015 *(Con't)*

significant database of prior FCC hot gas expander models that can be quickly leveraged for future RLA's. The analysis models were updated for the particular flowpath and operating conditions of this customer and life expectancies for the disk were rapidly estimated. This was another example of significant extended life calculated with LCF life exceeding 10,000 cycles. This job also provided an opportunity for RMS to leverage our new capabilities for in-house metallurgical replica creation, which is a key part of the metallurgical evaluation. This topic will be explored in a future article. This rotor is planned for re-installation and additional service in an upcoming operating campaign given the results of this RLA.

For further discussion on the mechanics of the stress analysis involved in an RLA, the prior two articles titled "Remaining Life Assessment" by William Sullivan, PE can be found using the newsletter index on the RMS website. RMS can provide an RLA on almost any rotor if the proper information can be provided or estimated. Typical operating speeds, pressures, and temperatures and cooling system information must be estimated (usually from instruction book data). It should be noted that even if an RLA is requested only for the rotor disk, that the rotor blades are also required for reverse engineering. This is because the blade geometry must be modeled as accurately as possible since the mass and CG of the blade is the highest contribution stress on the disk from centrifugal forces.

CONDENSER LOAD ON STEAM TURBINES

By Scott MacFarlane

For a turbine to be considered condensing, the exhaust pressure of the steam must be less than atmospheric. Condensing steam turbines operate with greater pressure drops throughout the turbine which results in larger power output. These operating conditions create additional loads on the steam turbine that vary based on the exhaust nozzle size. Figure 1 shows the relationship between the turbine exhaust nozzle size and the compression force between the turbine exhaust and condenser.

Due to these forces and the event of the turbine operating non-condensing, there are two typical configurations for mating the components. The first configuration has the condenser being rigidly fastened to the exhaust nozzle as shown in Figure 2. In this arrangement the "squeezing" load on the components is no longer the issue. The issues becomes supporting the condenser's over hung weight or the possibility of the turbine operating non-condensing if the condenser is rigidly fixed to the baseplate. If the turbine operates non-condensing and the condenser is rigidly fixed, the condenser would grow upwards from the hotter exhaust temperatures and would try to move the turbine upwards. This would ultimately lead to one of the components failing. A remedy to this issue is the implementation of calibrated springs under the condenser feet. The springs would be capable of handling the condenser weight during normal operation and would minimize the upward thrust of the condenser from the turbine operating non-condensing. The second configuration utilizes an expansion joint between the turbine and condenser. Figure 3 shows a typical expansion joint configuration. Here the forces trying to compress the components during normal operations or separate them during non-condensing operation become the issue. It is important that the expansion joint be flexible enough to withstand the constant changes in operating conditions. With this configuration

Turbine Exhaust Nozzle Size		Compression Force between Turbine & Condenser (Condensing Operation)			Tension Force between Turbine & Condenser (Non-Condensing Operation)
Diameter (Inches)	Area (Sq. Inches)	26" Hg Vacuum (lbs-f)	28" Hg Vacuum (lbs-f)	29" Hg Vacuum (lbs-f)	10 PSIG Back Pressure (lbs-f)
30	706.9	9,027	9,719	10,066	7,069
36	1,017.9	12,998	13,996	14,495	10,179
42	1,385.4	17,692	19,050	19,729	13,854
48	1,809.6	23,108	24,881	25,768	18,096
60	2,827.4	36,106	38,877	40,263	28,274
72	4,071.5	51,993	55,983	57,978	40,715
84	5,541.8	70,768	76,199	78,915	55,418
96	7,238.2	92,432	99,526	103,072	72,382

Figure 1

CONDENSER LOAD ON STEAM TURBINES *(Con't)*

The expansion joint configuration is the simpler option but both come with their own set of pros and cons. The expansion joint is more susceptible to fatigue cracking and erosion from the steam. The benefit of the direct bolted joint configuration is less possibility of air leaking in and deteriorating vacuum and performance. However, the springs in this configuration can cause immense twisting moments from the changing temperatures and pressures of the circulating condenser water. Both configurations should be considered when installing your condensing turbine.

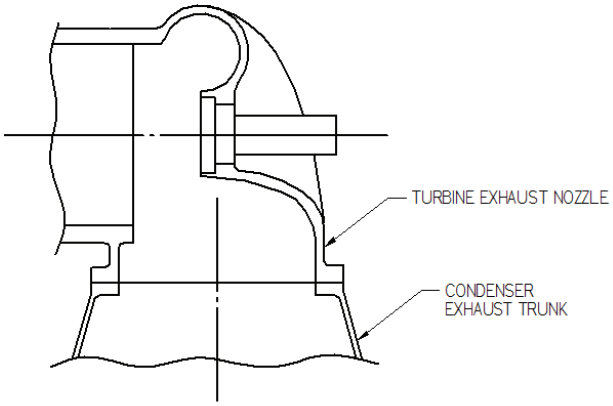


Figure 2

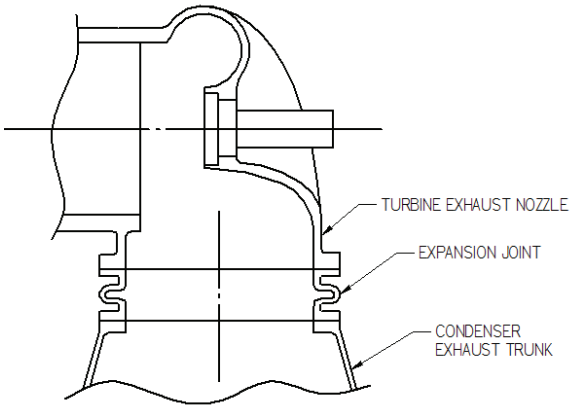
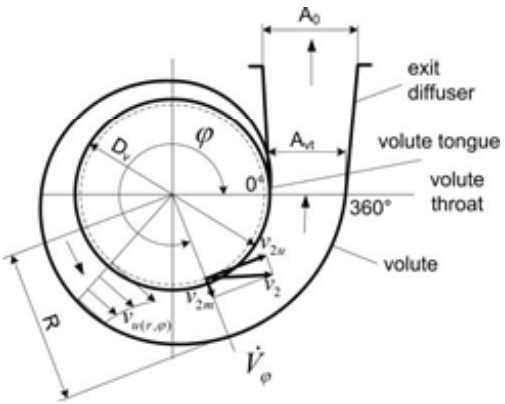


Figure 3

SCROLL MATCHING

By Joseph Cruickshank, PhD

"Scroll matching" is a term that is often encountered in the field of centrifugal compressor design and applications. There is very often a mystery surrounding it because unlike other centrifugal compressor terms such as "impeller tip Mach number", "impeller diameter" or "surge flow", the component terms of the word "scroll matching" do not provide any intuitive explanation as to what the term could possibly mean no matter how well-versed in the use of the English language one is or how broad a background in the general field of mechanical engineering one might have. An obvious and quite legitimate question I have encountered is: "The scroll is being matched to what?" to which there can be no simple answer for the non-aerodynamicist. This is due in part to the fact that scroll matching is a made-up term and is based on a calculation using parameters that are not physically observable or obvious to most people unless they happen to be deeply involved in the aerodynamic analysis of centrifugal compressors.

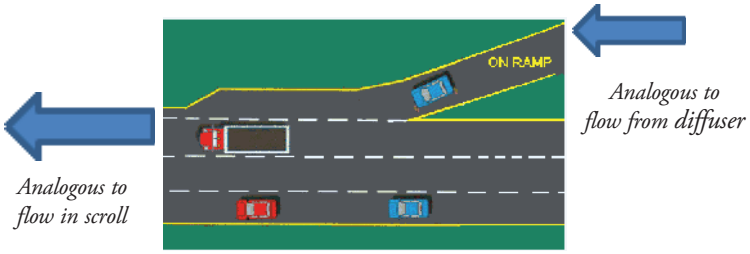


Typical cross section of a scroll or volute

Because of its relatively mysterious nature, I find that the concept of "scroll matching" is best explained using a concept with which we are all familiar: the flow of traffic from an on-ramp on to the freeway. Imagine a driver going on to the freeway. He has several choices as to how to merge with the traffic on the freeway. If he is a teenager driving a Mustang GT 5.0, chances are he will be merging at speeds far in excess of the average speed of the cars on the freeway. His entrance on to the freeway will be quite dramatic and highly disruptive as he hits his brakes to prevent crashing into the back of the "slow pokes" in the right lanes. This will have a ripple effect on all the traffic behind him as other drivers also hit their brakes to avoid crashing into him or the drivers behind him. Clearly this will result in inefficiencies in the flow of traffic on the freeway.
At the other extreme we have the nervous and inexperienced driver, also merging on to the freeway, but at speeds well below that of the freeway traffic. Here again, his entrance will also be disruptive of traffic and will result in similar inefficiencies in the overall traffic flow.

SCROLL MATCHING *(Con't)*

Clearly the most efficient means of merging traffic from the on-ramp with traffic on the freeway is if the two speeds are reasonably well-matched.



The analogy with scroll matching follows from how the gas coming off the tip of the diffuser wall gets into the scroll. The tangential component of the absolute gas velocity at the diffuser exit is what drives the gas into the scroll or volute. This velocity may be thought of as the on-ramp velocity. At the same time the gas already in the scroll is heading in the same direction as this tangential velocity and the two are forced to merge. The scroll (volute) will experience inefficiencies if these two velocities are not well-matched similar to the freeway traffic.

The scroll matching parameter is generally defined as (approximately) the ratio of the average velocity in the scroll (based on the volume flow rate and scroll area just before the gas is discharged into the exit nozzle) and the gas tangential velocity at diffuser exit, all at design conditions. This means that an oversized scroll will have relatively lower scroll velocities (called under-loading) compared to the diffuser tangential velocity and the scroll matching will be less than 1.0. The opposite (over-loading) will be true for an undersized scroll and the scroll matching (again at design point) will be greater than 1.0.

There are similar disruptive effects from this over-loading or under-loading of the scroll and just as with our freeway analogy they result in inefficiencies in the performance of the scroll. This is why the scroll matching parameter is key in the assessment of compressor overall performance.

The scroll matching parameter is also very important in assessing the rerate possibilities of existing compressors. Most of the time, it is assumed during rerates that the scroll is not to be changed or modified in any way, therefore asking for an increase or decrease in the flow in an existing compressor will affect the direction (negatively or positively) of the scroll matching parameter and hence the predicted efficiency of the compressor. An originally over-loaded scroll will result in increased losses if a flow increase is desired (all other things being equal) and vice-versa for an under-loaded scroll.

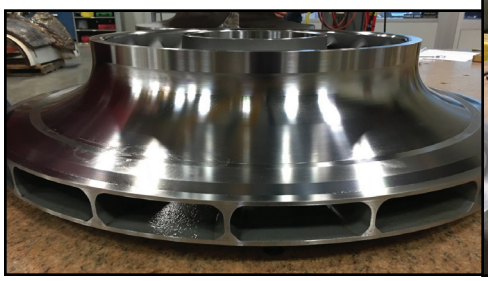
When purchasing a compressor from an OEM, it is advisable that future rerate considerations should be taken into account, if possible, in discussing the scroll or volute employed in the unit under consideration to ensure optimal performance in the future when the inevitable rerate is undertaken.

REVERSE ENGINEERING OF 5 DIFFERENT IMPELLERS

By Dean Curtis

RMS recently completed a project in which we reverse engineered 5 different impeller wheels for a wet gas compressor. The wheels were inspected using our Faro Arm and traditional metrology tools.

For each wheel, a solid model was made, then aerodynamically and structurally analyzed. A new model was then recreated in Solid Works, using data gathered from those analyses and inspections. After that each impeller was fabricated and machined.



The design team consisted of (left to right) Ryan Montero, Aerodynamicist, Dean Curtis, 3D CAD Designer, Chris Sykora, Structural Engineer, and Bob Dehart, Metrologist.

AN INTRODUCTION TO COMPRESSOR OIL SEALS: FACE CONTACT TYPE

By Tom Keating, PE

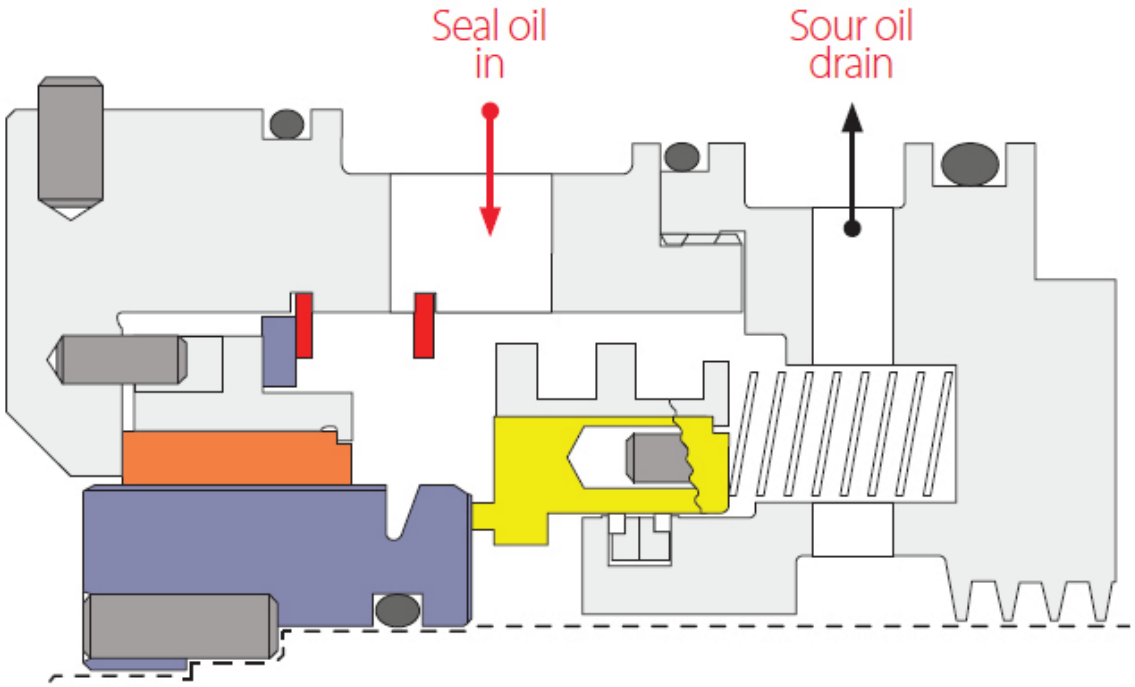
Although there have been advancements in the science of compressor sealing, oil seals and their associated support systems are still widely employed due to their simplicity and reliability.

Compressor oil seal assemblies are designed to have a high pressure primary seal at one end and a secondary seal at the other end. Oil is pumped into this annular area formed by the sealing elements .The oil is at a higher pressure than the process gas. This forms a high pressure barrier to prevent the gas from escaping the pressurized casing. The compressor oil seals are essentially liquid buffer seals that are designed to minimize the amount of seal oil that passes into the compressor.

Face contact seals have a stationary and a rotating face, which provide the seal between the process gas and seal oil. A small amount of seal oil is forced between the two sealing faces to provide lubrication and cooling due to the seal oil differential pressure (usually 40-80 psid). This contaminated or "sour" seal oil (mixed with the process gas) is drained to seal oil traps for reclamation or disposal. Sour oil leakage rates are typically five to ten gallons per day per seal. A process labyrinth seal prevents the oil from entering the compressor. The stationary face, otherwise known as the "seal", has a secondary seal consisting of a process compatible elastomer o-ring. The secondary seal must slide on the seal housing or sealing element face as the rotor moves axially. Springs are used to load the seal faces in operation in addition to the hydraulic load, as well as when the unit is not in operation. Face seals have typical maximum surface velocity and seating pressure limitations: 350 feet per second and 500-1500 psia, respectively.

A floating bushing seal is typically used on the atmospheric side of the seal to maintain the seal housing pressure. The oil that passes through the outer seal is drained directly back to the lube oil reservoir because it is not contaminated with process gas ("sweet"). The bushing seal clearance is designed to provide the correct differential pressure on the process seal while at the same time providing enough oil flow through the bearing area to cool the seal (normally around five to ten gpm).

Alternatively, some compressor seal designs use a complementary face contact seal ("double seal" configuration) on the atmospheric side. This is usually required for high surface velocities, when the oil flow cannot be sufficiently controlled with a bushing seal. Depending on the seal design and application, the outer seal oil flow may require a separate drain to the reservoir. This flow requires an orifice or a control valve to maintain the seal oil differential pressure.



SPOTLIGHT ON:

PROMOTIONS

Dirk Paraschos - General Manager

Dirk Paraschos joined RMS in December 2012 and quickly became an integral part of the RMS team. Prior to being promoted to General Manager he most recently held the position of Manager of Project Managers.
Dirk has thirty six years of experience in the International Onshore and Offshore Refining and Petro-Chemical Industry. A majority of his career has been working with Mexican Corporations that support Petroleos Mexicanos (Pemex).

Prior to RMS, Dirk held the position of V.P. of Business Development for Constructora Bay de Mexico S.A. de C.V. As part of CCC Fabricaciones Y Construcciones, S.A. DE C.V. he held the positions of Director of the Gas Compression Division, General Manager and Superintendent of Gas Compression Modules. Dirk started his turbo-machinery career at Ingersoll Rand as a Service Supervisor specializing in control systems and start-ups.

Gabrielle Koltisko -
Engineering - Administrative Assistant

Gabrielle has been a member of the Rotating Machinery Services team since her start as Receptionist/Administrative Assistant in 2014.

In this role, she was able to work closely with all RMS personnel, suppliers and visitors to achieve a better understanding of the industry. Her assistance throughout all departments in the company led to a smooth transition into her current promotion as Engineering-Administrative Assistant. In this role she will be able to focus her strengths to assisting the engineering department primarily, as well as supporting other areas as needed.

"We are what we repeatedly do. Excellence, therefore, is not an act but a habit." - Aristotle

MEET OUR NEW STAFF MEMBERS

Amanda Brunstetter - Receptionist

Amanda has 16 years in the Customer Service Industry and a Dental Receptionist for 13 years. She resides in Easton with her fiancé, his daughter and her 13 year old son. Amanda is very excited to learn new things and be a part of a successful company.

Ryan Rottier - General Manager /
Lead Engineer, Appleton Office

Ryan joins the RMS team as General Manager / Lead Engineer for the Appleton, WI office.

Ryan has worked for GE Oil & Gas / A-C Compressor for the past 17 years including roles of Application Engineer, Design Engineer, Team Leader and Engineering Manager. His focus has been with Custom Centrifugal compressors but also has experience with Oil Free Screw and Axial compressors and Turboexpanders.

Ryan has a MS in Organizational Leadership and Quality from Marian University and a BS in Mechanical Engineering from UW-Milwaukee. He and his girlfriend Robyn reside in Appleton with his two children, Cameron and Laurene

John Decker - Senior Repair Engineer
Appleton Office

John brings 34 years of compressor related experience to RMS, starting with Allis Chalmers as a field service rep, then A-C Compressor in roles from compressor test floor lead, repair shop coordinator, field service supervisor and project manager, and in the last years as a senior technical support engineer on the A-C Compressor centrifugal, axial and oil free screw compressor product line for GE Oil and Gas. His career has been primarily in the service /aftermarket sector which provided a broad exposure to equipment and field related opportunities to assist customers bring resolution and restore reliability.

(Continue next page)

SPOTLIGHT ON:

MEET OUR NEW STAFF MEMBERS

John graduated from the University of Wisconsin Platteville and Milwaukee School of Engineering. John and his wife Anne live near Appleton and enjoy time with their two daughters' families.

Joe Cruickshank, Ph.D - Senior Aerodynamicist, Appleton Office

Joe joins the RMS team as Senior Aerodynamicist for the Appleton, WI office. He has worked for Carrier Corporation in Syracuse, NY, GE in Fitchburg, MA and AVCO Research Labs(Textron) in Everett, MA. For the immediate past 22 years he has worked for GE Oil & Gas / A-C Compressor starting as Aerodynamics Engineer and retiring in 2012 as Consulting Engineer, Aerodynamics at GE Oil and Gas in Houston, TX. His focus has been aerodynamic design of Custom Centrifugal compressors but he also has extensive experience with software development using Fortran and Visual Basic. Joe has B.Sc and M.Sc degrees from the University of California (Berkeley), a Ph.D in Engineering Mechanics from Iowa State University in Ames, IA and a B.Sc in Computer Science from Lakeland College in Sheboygan, WI. Joe is married and lives with his wife Catherine in Menasha, WI. He has three daughters and a son with the two older daughters living in Los Angeles, California and Philadelphia, PA. The last two children live in Madison, WI.

Robert King - Senior Design Engineer Appleton Office

Rob joins the RMS team as Senior Design Engineer for the Appleton, WI office. He has worked for GE Oil & Gas / A-C Compressor for the past 10 years starting out as Test Engineer and transitioning to Design Engineer with most of his experience focused on centrifugal compressors. Rob holds a BS in Mechanical Engineering from University of Wisconsin Madison. He is originally from the Appleton area and lives there with his wife Amanda, and two children Layla and Syler.

Tim Woods - Senior CAD Designer Appleton Office

Tim joins the RMS team as Sr. Cad Designer in the Appleton WI office. Tim worked at A-C Compressor/GE for 18 years. Over the years Tim was a designer with new units for Sliding Vane, Oil Free Screw, Single Stage, DH, Barrel and Horizontal Split compressors. For the last 4 years Tim was designer for the service side of the business and really enjoys the challenges that brings. He and his wife Debbie have been married for 20 years and have two boys, James 19 and Andrew 17.

Andy Jansen - Regional Sales Manager Appleton Office

Andy joins the RMS team as Regional Sales Manager. He brings with him 20+ years experienced with AC Compressor. Over the years, Andy has had experience in the drafting/design department, expediter/project manager role for overhaul and repair of the A-C fleet, continuing his advancement into Commercial Operations specifically geared towards overhaul & repair and field service.

He then moved on to Technical Sales which focused on A-C Compressor, Rotoflow cryogenic expanders, Thermodyn steam turbines. In his most recent role he was an Account Manager covering the Midwest, Rocky Mountains and West Coast until joining RMS. Andy lives in Kaukauna, WI with his wife Kim and his 2 sons, Sam 18 and Drew 15.

Highly skilled A-C Compressor experience right at your fingertips!

SAFETY TIPS

By Tom Edwards

Spring Safety Tips & Seasonal Reminders for the Home

The change of season is a good time to preventive maintenance / checkups on your home. Like getting a physical at the doctor, it's important to periodically and fix any wear and tear damage on your home that may have occurred over the past few months.

- Replace the old batteries in your smoke detectors with fresh batteries.
- Make sure all your door locks are operating properly and install deadbolts on all doors with outside access.
- Install motion sensitive outdoor lights for safety and to deter criminals from breaking in.
- Trim your shrubs around the home where intruders can hide when they are preparing to break into your home.
- Go through old files and shred and discard unnecessary paperwork.
- Store important documents in a fireproof safe or in a safety deposit box at your bank.
- Consider renting a P.O. Box and send important mail there to prevent identity theft.
- If you don't have a security system, have one installed. This is the single most important action you can take to secure your home.

Spring Break Travel

While you are packing up your bags and preparing for a week off, don't forget the home is an easy target for criminals while you are away. In addition to the usual making sure the neighbors check your mail for you, and locking the doors before you go, here are some extra tips to send you on your way to your stress-free vacation!

- Notify your post master to stop your mail delivery while you away.
- Be cautious of what you post on social media. Resist the urge to broadcast your whereabouts to the world and letting intruders know that you are out-of-town.
- Going abroad? Have your mobile phone set up for international calls, if needed.
- Set the thermostat down to around 55 degrees – it will help save on energy and utilities.
- Don't leave any items of value out in plain sight, especially near windows.
- Give a spare key to a reliable and nearby friend, neighbor or family member (or all three). They can periodically go by your house to check on things, if need be while you are away.
- Check travel advisories before you leave for vacation and become familiar with the customs and requirements.

The best possible way to have a stress-free vacation is to have a home security system. The system will alert you if an intruder should enter your home. It will also notify the authorities if there is a break-in or fire. The last thing you want is to come home and find your valuables gone, or worse, your home destroyed. Many home security monitoring companies offer systems with cameras that you can easily access from your smart phone.

"We must respect the past, and mistrust the present, if we wish to provide for the safety of the future"

Joseph Joubert

RMS NEWS

By Kathy Ehasz

45th TURBOMACHINERY SYMPOSIUM #BOOTH 2039

Rotating Machinery Services, Inc. will be exhibiting at the Turbomachinery Symposium again this year. The symposium will be held on September 13 - 15, 2016 at the George R. Brown Convention Center in Houston, Texas. Please stop by our booth #2039. We are excited to share some exciting news and updates with you all!

We will kick off the week by hosting a Customer Appreciation Event at the The Grove (located directly across the street from Hilton Americas) on Monday evening, September 12th. Invitations will be sent out in June. It is going to be special event, so please plan on attending! We look forward to seeing all of you there!

GMRC GAS MACHINERY CONFERENCE 2016

We are also exhibiting at the GMRC Gas Machinery Conference this year. This year's conference will be held in Denver Colorado at the Colorado Convention Center October 2 - 5, 2016. So if you miss us at the Turbomachinery Symposium, catch up with us here. We enjoy seeing you!

POWER RECOVERY TRAIN ROUND TABLE 2016 - 5th YEAR!

We do not stop there! Rotating Machinery Services has hosted a Power Recovery Train Roundtable for the past 4 years. Each year, we hear positive feedback from our customers and the value it brings them. This year we celebrate our 5th annual Power Recovery Train Roundtable on October 25 - 26, 2016. On Monday evening, we will hold a Welcome Reception to welcome all our attendees.

Registration will open up on May 18th. Packets will be sent out via US Mail, email or you can also elect to register on our website under Conferences at www.RotatingMachinery.com. Spaces are limited and attendance has been climbing each year, so please reserve your spot early. If you would like additional information, you can contact Don Shafer at dshafer@rotatingmachinery.com or Kathy Ehasz at kehasz@rotatingmachinery.com or the Corporate office at 484-821-0702.

EMPLOYMENT OPPORTUNITIES AT RMS

Rotating Machinery Services has proven experience in the Turbomachinery industry both in technical expertise and providing our customers with undeniable excellent customer service. We are growing rapidly and have the following positions available. Turbomachinery experienced preferred.

Please check out our web site under Career Opportunities for further details. *www.RotatingMachinery.com*

- Shop Supervisor
- Project Manager
- Quality Inspector
- Applications Engineer
- Mid-Senior Buyer

We are looking for exceptional people to be part of our growing team! RMS believes that our employees drive the success of the company and we strive to provide challenging and stimulating opportunities.

Please email resumes to HR@rotatingmachinery.com or mail to:
Attn HR Department
Rotating Machinery Services, Inc.
2760 Baglyos Circle, Bethlehem, PA 18020

RMS
Rotating Machinery Services, Inc.

Rotating Machinery Services, Inc range of products and services include:

**Axial Compressors,
Centrifugal Compressors,
Gas Turbines, Power Turbines,
Steam Turbines, FCC Expanders,
Nitric Acid Expanders**

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

WE CAN PROVIDE THE TURBOMACHINERY SUPPORT & EXPERTISE YOU ARE LOOKING FOR!

Contact Us Today

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