

Compressor Works

Issue XIV
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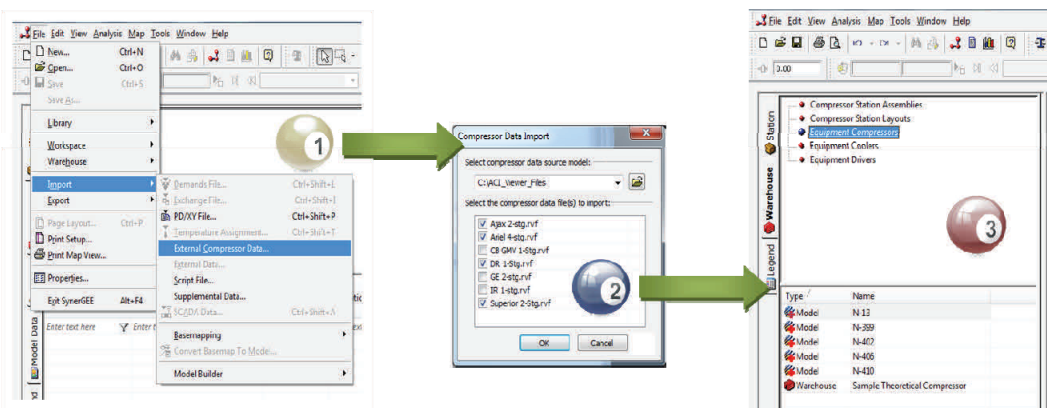
SynerGEE® Gas - eRCM Viewer™ Integration

ACI's eRCM Viewer has been integrated into GL Noble-Denton's 4.6.0 version of SynerGEE Gas. This integration allows users to import their eRCM compressor data directly into SynerGEE Gas via a simple, automated process that eliminates data duplication and time overhead.



Inside this issue:

<i>Compressor Optimization</i>	2
<i>Interference Fit Liner Installation</i>	2
<i>A Myriad of Distance Pieces Available</i>	2
<i>Staying Connected</i>	3
<i>ACI Team Profile—Brett Kyle</i>	3
<i>Norm's Notes</i>	4



Look for ACI at these events:

Global Petroleum Show
June 12th-14th

WY Gas Fair
Sept. 12th-14th

GMC 2012
Sept. 30th-Oct. 3rd

Thereafter, completion of robust hydraulic analyses in SynerGEE Gas provides users with additional compressor performance feedback about SynerGEE Gas determined compressor operating points via the eRCM calculation engine. All limit violations or operating errors raised by the eRCM calculation engine will be subsequently logged in the SynerGEE Gas analysis message logs. Since the eRCM engine models OEM units based on OEM-provided guidelines (rod loads, pin non-reversals, crankpin forces, volumetric efficiencies, temperature preheats, etc.), these additional performance insights provide SynerGEE users with even more understanding, critical information, and control over their compression assets. Moreover,

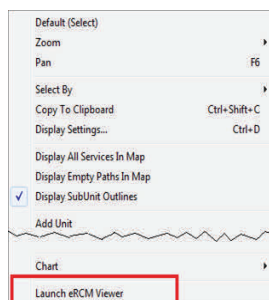
users can access these features straight from the Station Analysis Tool.

For user convenience, ACI's eRCM Viewer can be launched directly from the SynerGEE Gas station view: just right-click compressor object for a popup menu and select the *Launch eRCM Viewer* item. Users can then review individual point performance, full performance curves, tables, 3D Plots, or charts combining results from *millions* of performance points.

A consistent modeling approach for reciprocating compressors benefits all company sectors: Operators, Gas Control, Engineers, Pipeline Simulation, PLC Controls, and Unit Monitoring.

End-users that can create and model their reciprocating com-

pressors according to OEM guidelines, tune them to field-data from analyzers, and then easily incorporate those models into pipeline modeling software are efficiency masters. Only licensees of eRCM and SynerGEE Gas have these integrated tools available to them, and licensees can expect even more features in future version releases.



Compression Problem Solvers



**We Optimize it
We Design It
We Build It**

Compressor Optimization

ACI was asked to provide a solution for a customer with six Cooper Bessemer GMV-8TF units that were experiencing high suction temperatures for the 2nd stage cylinders due to cooler limitations. In addition, the customer's operating map had fluctuated and it reached a point where the engines and compressors were no longer lined up with current or projected operation conditions.

ACI suggested changes to the compressors, along with engine automation. The automation system allowed the engines to be run consistently at 100% torque. Prior to the automation, the engines operated around 80%

torque. The compressor changes, coupled with the automation, greatly increased the throughput, efficiency and flexibility of the existing units.

The final solution was to decrease the bore on the 2nd stage cylinder from 8.0-in. to 7.5-in. along with adding a 175 cubic in. valve cap fixed volume clearance pocket (FVCP) on the head end of each 1st stage cylinder and then automation of all existing pockets. The bore size on units 5 & 6 1st stage cylinders were enlarged to 13-in., making all six engines identical and easier for the mechanics, operators and control system. Like engines also created

the benefit of a cost reduction for spare parts.

The number and arrangement of the pocket unloaders was designed to maximize throughput and flexibility of the engines based on the current and forecasted operating map. The intention was to create a loading matrix that had incremental torque steps of 3-5%. The engine control panel can now safely and efficiently step through the loading matrix for a wide range of operating conditions.

Interference Fit Liner Installation



These photos show one of ACI's many interference fit liner installations being completed with the use of liquid nitrogen to thermally shrink the liner diameter so it can be inserted in the cylinder bore. Once the liner temperature returns to normal, the liner is permanently installed with an interference (shrink) fit.



Engineered Solutions — OEM Replacement Distance Pieces

ACI continues to solve design-related and availability problems on older reciprocating compressor components. A recent example is the design and production of new distance piece assembly to replace the Cooper Bessemer JM-32-2 and JM-32-2A distance piece assembly used on the JM and other "M" line compressor frames, Figure 1.



Figure 1

The JM-32-2(A) distance piece is prone to developing cracks in the cylinder mounting holes as shown in Figure 2. Additionally, due to the vintage of the JM-32-2(A) assembly, the OEM is no longer readily producing new components, leaving the end-user to scour the used market inventory. Often, no assemblies are available, or only ones with defects



Figure 2

are available. ACI solves this problem by developing new designs to be functional equivalents, assembly #A02002 as shown in Figure 3. The new distance piece has been fully stress-analyzed, solving the cracking problem and is now a current production item available from ACI.



Figure 3

Staying Connected

You can now find ACI on social media sites such as: Facebook, Twitter, YouTube and LinkedIn. ACI wants to help you stay connected with the latest news, products and upcoming shows ACI will be attending.

We also encourage you to, "LIKE" ACI on Facebook, "follow" our Tweets on Twitter as well as posting your "tweets" on Twitter, view our "Inside Business" video posted on YouTube and connect with us on LinkedIn. Social media is a great way to learn more about ACI Services, Inc. and the natural gas industry.

Please post your questions, comments and feedback on any of these social media sites and we will be happy to answer your questions.

You can find the links to these social networking sites on our website:

www.ACIServicesInc.com

Search Keyword:

ACIServicesInc



In addition to social media, we have a very informative website in which we take great pride. It provides a plethora of useful information and many **FREE** downloads. It provides information about products and services which ACI offers and can link you to Compressor Connection — your source for finding new and used compressors and parts.

Wanting to know what industry conference ACI will be at next? Just visit the ACI website and click News & Events and then click on ACI Conference Schedule which is located in the bottom right hand side of the webpage.

Did you know that you can download not only the current issue of Compressor Works newsletter, but you can also download previous issues? In addition, you can download for **FREE** additional ACI publications and papers. Again, simply click on News & Events and you can start downloading any and all of the publications which we have to offer.

If you are still having trouble locating what you are seeking on the website, please call: 740-435-0240 ext. 509 and speak with Kerri McMullen. She will be more than happy to assist you.

ACI Team Profile — Brett Kyle

Brett Kyle is one of the great people who came to us through the acquisition of GAS Products™ in December of 2008. Brett worked for Lauren Sperry and Wayne Thielson at GAS Products for six years where he served as Manufacturing Manager. Upon the purchase of GAS Products, Brett was named Operations Manager, a position that oversees the day-to-day operations of ACI's growing valve center of excellence. 2012 marks the 10th year for Brett in the natural gas industry, where he has been involved in numerous valve and unloader projects.

Brett graduated from Flint Hills College with a degree in Manufacturing Technology. He gained valuable experience while working for two job shops serving the medical and aircraft industries. For Honeywell where he manufactured aircraft avionics for Boeing, Cessna and Air Bus. Brett also worked for Maruka which is a distributor for Mori Seiki and Fadal CNC machines. There he served

as a Field Service Engineer repairing the full line of Mori Seiki Machining centers as well as training and set up on these machines. Along the way he was certified in Six Sigma and Lean Manufacturing techniques. Combining Brett's manufacturing and industry knowledge helps ACI bring quality and competitive products to the industry. Add this to the patented designs and increased technology of ACI you can quickly see why ACI's Gas Products valve division is growing to serve more and more customers each year.

When he is not working, Brett enjoys spending time with his wife and son as well as anything outdoors or sports-related. He enjoys hunting, fishing, working on his land, helping his brother with his late-model race car, riding his dirt bike and watching sports.



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- No Need to Remove or Replace Cylinders
- No Need to Reconfigure Piping
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- Simply Change FlexBore internals

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Norm's Notes

Thanks to the confidence of our loyal customers and the dedication and hard work of our team, ACI is enjoying a phenomenal year! In addition to a record sales year, ACI is very active in providing research and training for the advancement of the gas compression industry.

We are in the 2nd year of a 2-year project to develop a new *GMRC Specification and Guideline for Large, High-Speed Reciprocating Compressor Packages for Gas Transmission and Storage Applications*. During the summer, we expect to resume work on the development and commercialization of a Tunable Side Branch Absorber, using technology licensed from the GMRC. And our Performance Augmentation Network (PAN) project with El Paso is approved by the GMRC pending final co-funding from member companies.

ACI developed and presented a compressor tutorial and led the new technology sessions at the Gas Electric Partnership Workshop in February. We teamed up with several other companies to provide a workshop on compressor analysis for the GMRC, and we have the lead role in three short courses for this year's GMC in October.

With our Cambridge office expansion completed, this year we will focus on additional paving, more parking lot space, an additional horizontal boring mill and a number of other improvements to our Cambridge facility, investing for further growth and efficiency.

Welcome to George Elefteriou of Noblestone, as ACI's newest sales representative, covering customers in Ohio and the western parts of NY, PA and WV. I'd also like to welcome several new people who have joined the ACI team: Bill Rose (Application Engineer based in Texas), Gary Statler (Metallurgist), Kerri McMullen (Marketing Assistant), Jessica Gilcher (CAD Drafter), and Joe Wilson (Applications Programmer). Finally, Tyler Clark (MSME candidate) and Joe Mosley, Jr. are working at ACI as mechanical engineering interns during their summer break from The Ohio State University.

With sadness, we inform that Dick Doup passed away recently after several years of failing health. Dick was a very creative compressor designer and an important contributor to ACI's success for many years prior to retiring in 2008. Our prayers and encouragement go out to Glenn Shafer who was seriously injured in a recent car wreck. We also remember Lauren Sperry, who continues in the long recovery process from a stroke and other health problems.



W. Norm Shade, PE, President

"Life is 10% what happens to you and 90% how you respond to it."

-unattributed

Brain Teaser

Be the first to submit the correct answers to both Brain Teasers and win.

Send your answers to:

kmcmullen@ACIServicesInc.com

1. Bet you get this one; On a roulette wheel with numbers 0-36, Bob has made a bet. The number he picked is an odd number, divisible by 3, when its 2 digits are multiplied the answer is between 4 and 8. If the two digits are added, the answer still falls between 4 and 8. What number did Bob pick?
2. Word wobbles; The following are palindromes (spelled the same backward and forward, like "Madam" and "Otto"):
 1. Not slopping (5 letters)
 2. A mechanical part that moves something in a circle (7 letters)
 3. Males and females (5 letters)