

THANK YOU TO EVERYONE WHO MADE THIS EVENT POSSIBLE

Dr. Petersen genuinely thanks every one of the advisory committee members, technical session leaders, exhibitors, staff, and attendees for their efforts toward a successful TPS. We present this year another unparalleled exhibit hall and cutting-edge technical program while fostering an environment of networking and promoting continuous education in turbomachinery and pumps.

ORGANIZED BY





TURBOMACHINERY LABORATORY TEXAS AAM ENGINEERING EXPERIMENT STATION

HOUSTON, TEXAS

GEORGE R. BROWN Convention Center (GRBCC)

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INTRODUCTION

TURBOMACHINERY INTERNATIONAL

YOUR RESOURCE FOR THE LATEST INDUSTRY NEWS IN THE ENERGY AND INDUSTRIAL MARKETS.



COMPRESSORS The Next Generation of Compressor Lube OU Systems

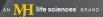
Maximizing Hole Measuring with Bore Gages SNOW REPORT WTUI 2023 Show Rep Innovations & Technole How Settle-Out Pressure Impacts Compressors

CO₂ CAPTURE & STORAGE ACCELERATE NET-ZERO GOALS



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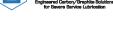
Delegate Bags



Escalator Runners



Floor Aisle Indicators



Highlighters



Koozies

PRECIS

Pocket Maps



Lanyards



Social Media



Pens



Women of TPS Event Prize



Women of TPS Event Prize

Get exposure next year by securing your sponsorship today. Contact mbarton@tamu.edu.

Notepads | Coffee Breaks | Post-It Notes | Wi-Fi Spouse Event | Women of TPS Event

8



WIFI CONNECTION



With a WiFi-enabled device, find the wireless network named **TurboPump**.

Connect to the wireless network named **TurboPump**.

Once connected to the network, open up an internet browser.

You should automatically be directed to the splash page, regardless of what your home page is set to.

There is no password required. Press Connect.

































THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA







GAS PROCESSING & LNG





HYDROCARBON PROCESSING











11



































Vibration

ADDITIONAL EVENTS

WELCOME ADDRESS

FOR WHOM?

All TPS attendees, including Free Pass.

TUESDAY:

8:00 A.M. - 8:35 A.M.

ROOM:

Level 3, Grand Ballroom C

More information will be provided regarding the speakers for the Welcome Address the week before the conference.

WOMEN OF TPS LUNCHEON

FOR WHOM?

All TPS attendees. Registration is required. Add-on to any registration option.

WEDNESDAY:

12:00 P.M. - 1:30 P.M.

ROOM:

Level 3, 350E

Women of TPS was organized to recognize the women making a difference in the historically male-dominated STEM industries, working with and around the turbomachinery, pump, oil and gas, water, power, and chemical/petrochemical companies. It is also an event centered around networking with other successful women and men in these

sectors, inviting everyone to relax and enjoy a plated meal, game, and presentation. Both women and men are encouraged to attend. Space is limited and seats are \$75.00 per person.

MOBILE APP

FOR WHOM?

All TPS attendees, including Free Pass.

EVERY DAY:

8:00 A.M. - 5:00 P.M.

Search for and download our **Turbomachinery & Pump Symposia** mobile app from your preferred app store the week before the event.

SOCIAL MEDIA SCAVENGER HUNT

FOR WHOM?

All TPS attendees, including Free Pass.

TUESDAY & WEDNESDAY:

8:00 A.M. - 5:00 P.M.

ROOM:

Level 1, Exhibit Hall Registration Counter

Scattered throughout the Exhibit Floor are items on the **Get Social TPS Social Media Scavenger Hunt** list. Visit participating exhibitors, take pictures, share it to social media and post our hashtag to play. When you're finished, drop your list in the Raffle Box located at TPS Booth 2022. Two winners drawn each day will receive a \$100 Amazon gift card.

Winners will be announced on Facebook Live at 5:30 P.M. on Tuesday and Wednesday.

SPOUSE PROGRAM

FOR WHOM?

Spouses of Symposia delegates.

TUESDAY:

11:15 A.M. - 12:45 P.M.

ROOM:

Meet a Turbo Lab Staff Member at Level 1, Information Booth Concourse Exhibit Hall D and you will be led to the activity of the day.

Spouses accompanying registered delegates can register for TPS free of charge and are invited to participate in spouse events.

INNOVATION PRESENTS STAGE

FOR WHOM?

TPS Symposia and Free Pass Delegates.

TUESDAY AND WEDNESDAY

3:30 P.M. - 5:20 P.M.

ROOM:

Level 1, Exhibit Hall D, left side near refreshment area.

The Innovation Presents Stage is a platform for exhibiting companies to provide 20-minute commercial presentations to the attendees of the Symposia. All TPS Exhibit Hall visitors are welcome to attend the presentations. A schedule can be found in this Show Guide and near the stage.

DINNERS

FOR WHOM?

TPS Symposia and meal tickets purchased separately.

TUESDAY:

Tex Mex Buffet | 7:30 P.M. - 9:00 P.M. | Level 2, Hilton Ballroom of the Americas A

WEDNESDAY:

Banquet Dinner | 7:30 P.M. - 9:00 P.M. | Level 2, Hilton Ballroom of the Americas A

The Turbomachinery Laboratory, organizer of TPS, hosts two dinners during the Symposia. Badges required - not available to Free Pass.

LAB TOUR

FOR WHOM?

All TPS attendees. Registration is required. Add-on to any registration option.

THURSDAY:

12:15 P.M. - 6:00 P.M.

MEET:

In front of the gift shop at the Hilton where transportation will be provided.

Where is the Turbomachinery Lab at Texas A&M? How is it equipped? What research projects are in progress? Take a tour of the lab with us to Texas A&M University in College Station, on Thursday afternoon following TPS. Add the tour to any registration option. Please note that space is limited. Lunch and transportation are provided.

HOSPITALITY SUITES

FOR WHOM?

TPS Symposia and Free Pass Delegates.

MONDAY, TUESDAY, AND WEDNESDAY:

6:00 P.M. - 10:00 P.M.

ROOM:

Companies can choose to host a hospitality suite for their guests. All hospitality suites are located at Hilton Americas - Houston. Please see the schedule at a glance for more information.

DR. CHILDS, RETIRED EMERITUS BOOK SIGNING

FOR WHOM?

TPS Symposia, Exhibition, and Free Pass Delegates.

TUESDAY:

2:30 P.M. - 5:00 P.M.

LOCATION:

Turbomachinery Booth 2022.

SHORT COURSES

The Turbomachinery Laboratory offers extended stand-alone short courses throughout the year led by industry experts and academics. Courses range from two to five days and offer working professionals valuable education opportunities in an interactive environment.

FALL & SPRING COURSES

BASIC PUMP FUNDAMENTALS: PUMP 101 | DECEMEBER 5 - 6, 2023

Pump 101 is a basic overview of pumps and pumping theory. The course is designed to review the basic pump designs or classifications and many of their applications on where they are used. We also cover the properties of fluids and the influence of pump choice and performance. This class is designed as an introductory for many topics such as the concepts of flow and pressure, viscosity, pump construction, cavitation, NPSH and an introduction to pump performance curves. If you need a refresher or are new to the industry this is a good one to consider. This course does quality for CEU's credit for individuals who have a registered professional license in the state of Texas.

CENTRIFUGAL COMPRESSOR OPERATIONS | MARCH 18 - 21, 2024

Centrifugal Compressor Operations for 21st Century Users (CCOPS) is intended for beginning-and intermediate-level professionals to accelerate their understanding of centrifugal compressors and how they are used in oil & gas applications. The course covers design aspects, aerodynamics, rotordynamics, the practical applications of installation, testing, commissioning and procurement.

ROTORDYNAMICS | MARCH 18 - 21, 2024

The Rotordynamics short course is for beginning- and intermediate-level engineers in the petroleum, chemical, power and gas industries. It provides a basis for understanding the rotordynamics—the behavior and diagnosis—of turbines, compressors, expanders, motors, pumps and generators and their subcomponents to help select, analyze, troubleshoot and repair them for maximum reliability. The course is packed with case studies and workshops for hands-on evaluation of actual machines.

RECIPROCATING MACHINERY DYNAMICS | MARCH 18 - 21, 2024

The course is intended for engineers/analysts who work with plant machinery and piping and must make decisions about the reliability and safety of systems experiencing high vibration.

REGISTER AND EARN CEU'S

Dates, pricing, credit information, and registration can be found on the Turbo Lab website at turbolab.tamu.edu.



PROGRAM DIRECTOR

Debbie Maggs Debbie@turbo-lab.tamu.edu 979-862-7114



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Advantages for End Users

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- Improved reliability and longer service intervals



Compression technology is in our DNA Scan to learn more

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VISIT THE PUBLICATION BINS

Peruse some of your favorite trade magazines and pick up some new ones! Publications of our TPS 2023 media partners are located at the front of the exhibit hall.

LEARNING FOR TODAY'S PUMP INDUSTRY, AT YOUR FINGERTIPS

WEBINAR.

Whether your work focuses on water and wastewater, chemical processing, or original equipment manufacturing, you need to stay up to date with the latest training. MPT's hosted webinars bring industry experts from leading companies to your computer and offer professional certificates for completion.

ados

Predictive Maintenance and Pump Efficiency

gdos

ITORING



Contact Russell via email: russell@mptmag.com

our visit: mptmag.com

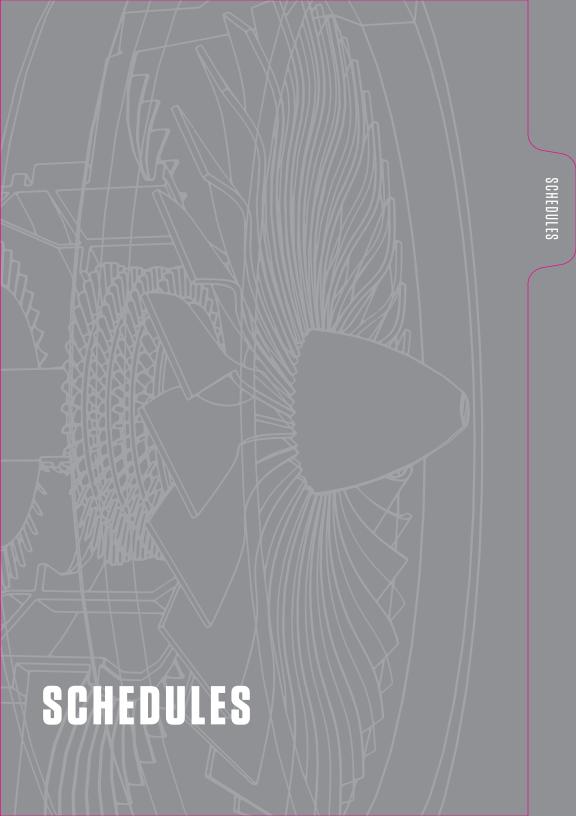
VISIT THE TURBOMACHINERY LAB



RESEARCH AND EDUCATION

A variety of fundamental and applied research is performed by faculty, postdocs and students. This research is sponsored by a combination of government and industry sources through traditional grants and contracts and covers the entire range of specialties of the Turbomachinery Lab research groups. Research areas encompass rotordynamics and mechanical systems, thermal fluids and combustion, and computational modeling and design. Unique test rigs and extreme environments are among the many reasons why the Turbomachinery Lab continues to be a leader in turbomachinery, propulsion- and energy-related research.

Meet the Turbo Lab-hosted transportation in front of the Hilton at 12:15 pm Thursday after the conference closes. The Turbo Lab is located in College Station, Texas and you will return at 6:15 pm. You are welcome to drive yourself but you must be registered to attend. Visit the Info Booth for more information.





| SUNDAY, SEPTEMBER 24, 2023 | | |
|----------------------------|-------------------------------------|--------------------------------------|
| 4:30 P.M 6:00 P.M. | Exhibitor Registration | Level 1, Exhibit Hall D |
| 4:30 P.M 6:00 P.M. | Delegate Registration | Level 3, Prefunction Area 340/350 |
| 4:30 P.M 6:00 P.M. | Leader Registration | Level 3, Room 340A |
| MONDAY, SEPTEMBER 25, 20 | 23 | |
| 7:00 A.M 12:00 P.M. | Delegate Registration | Level 3, Prefunction Area 340/350 |
| 7:00 A.M 12:00 P.M. | Exhibitor Registration | Level 1, Exhibit Hall D |
| 7:00 A.M 12:00 P.M. | Leader Registration | Level 3, Room 340A |
| 8:30 A.M 5:00 P.M. | Short Courses | Level 3 |
| 10:00 A.M 10:30 A.M. | Break | Level 3, Lounge Area |
| 12:00 P.M 1:15 P.M. | Short Course Luncheon | Level 3, Grand Ballroom C |
| 1:30 P.M 5:00 P.M. | Delegate Registration | Level 3, Prefunction Area 340/350 |
| 1:30 P.M 5:00 P.M. | Exhibitor Registration | Level 1, Exhibit Hall D |
| 1:30 P.M 5:00 P.M. | Leader Registration | Level 3, Room 340A |
| 3:00 P.M 3:30 P.M. | Break | Level 3, Lounge Area |
| 5:30 P.M 6:00 P.M. | Turbo Advisory Committee Meeting | Level 3, Room 350E |
| 6:00 P.M 6:30 P.M. | Pump Advisory Committee Meeting | Level 3, Room 350E |
| | | |

TUESDAY, SEPTEMBER 26, 2023

| 7:00 A.M 7:45 A.M. | Leader Breakfast | Level 3, Room 350E |
|-------------------------|---|--------------------------------------|
| 7:30 A.M 5:00 P.M. | Delegate Registration | Level 3, Prefunction Area 340/350 |
| 7:30 A.M. – 7:00 P.M. | Exhibitor Registration | Level 1, Exhibit Hall D |
| 7:30 A.M. – 5:00 P.M. | Leader Registration | Level 3, Room 340A |
| 8:00 A.M 8:30 A.M. | Welcome Address | Level 3, Grand Ballroom C |
| 8:45 A.M 10:15 A.M. | Symposia Technical Sessions | Level 3 |
| 10:15 A.M 10:30 A.M. | Break | Level 3, Lounge Area |
| 10:30 A.M 12:00 P.M. | Symposia Techncial Sessions | Level 3 |
| 11:00 A.M 12:00 P.M. | Lunch for Exhibitors | Level 1, Exhibit Halls C, D, E |
| 12:00 P.M 2:00 P.M. | Lunch and Exhibits Open to Paid Delegates | Level 1, Exhibit Halls C, D, E |
| 1:30 P.M 7:00 P.M. | Free Pass Registration | Concourse Exhibit Hall D |
| 2:00 P.M 3:30 P.M. | Symposia Technical Sessions | Level 3 |
| 2:30 P.M 7:00 P.M. | Exhibits Open Free to Public | Level 1, Exhibit Hall |
| 7:30 P.M 9:00 P.M. | Tex-Mex Buffet (Badges required, not open to Free Pass) | Hilton Ballroom of the Americas A |

| WEDNESDAY, SEPTEMBER 27, 2023 | | |
|-------------------------------|--|---|
| 7:30 A.M 8:15 A.M. | Leader Breakfast | Level 3, Room 350E |
| 8:00 A.M 5:00 P.M. | Delegate Registration | Level 3, Prefunction Area 340/350 |
| 8:00 A.M 6:30 P.M. | Exhibitor Registration | Level 1, Exhibit Hall D |
| 8:00 A.M 5:00 P.M. | Leader Registration | Level 3, Room 340A |
| 8:00 A.M 5:00 P.M. | Booth Selections for 2024 | Level 1, Exhibit Hall D, Exhibitor Registration Counter |
| 8:30 A.M 12:00 P.M. | Symposia Techinical Sessions | Level 3 |
| 10:00 A.M 10:30 A.M. | Break | Level 3, Lounge Area |
| 11:00 A.M 12:00 P.M. | Lunch for Exhibitors | Level 1, Exhibit Halls C, D, E |
| 12:00 P.M 2:00 P.M. | Lunch & Exhibits open to Paid Attendees | Level 1, Exhibit Halls C, D, E |
| 12:00 P.M 1:30 P.M. | Women of TPS Luncheon | Level 3, Room 350E |
| 1:30 P.M 6:30 P.M. | Free Pass Registration | Concourse Exhibit Hall D |
| 2:00 P.M 3:30 P.M. | Symposia Technical Sessions | Level 3 |
| 2:30 P.M 6:30 P.M. | Exhibit Open Free to Public | Level 1, Exhibit Hall |
| 7:30 P.M 9:00 P.M. | Banquet (Badges required, not open to Free Pass) | Level 2, Hilton Ballroom of the Americas D |



| THURSDAY, SEPTEMBER 28, 2023 | | |
|------------------------------|---------------------------------|---|
| 7:30 A.M. – 8:15 AM | Leader Breakfast | Level 3, Room 350E |
| 8:00 A.M 11:00 A.M. | Delegate Registration | Level 3, Prefunction Area 340/350 |
| 8:00 A.M 11:00 A.M | Exhibitor Registration | Level 1, Exhibit Hall D |
| 8:00 A.M 11:00 A.M | Leader Registration | Level 3, Room 340A |
| 8:00 A.M 11:00 A.M | Booth Selections for 2024 | Level 1, Exhibit Hall D, Exhibitor Registration Counter |
| 8:30 A.M 12:00 P.M. | Free Pass Registration | Concourse Exhibit Hall D |
| 8:30 A.M 12:00 P.M. | Symposia Technical Sessions | Level 3 |
| 10:00 A.M 10:30 A.M. | Break | Level 3, Lounge Area |
| 9:30 A.M 12:00 P.M. | Exhibits Open Free to Public | Level 1, Exhibit Halls C, D, E |

HAVE YOU RESERVED YOUR BOOTH For TPS 2024?

Visit the Exhibitor Registration Counter in Hall D to book before you leave TPS 2024.

WEDNESDAY, 8:00 A.M. – 5:00 P.M. THURSDAY, 8:00 A.M. – 11:00 A.M.

TPS 2024: AUGUST 19 - 22, 2024





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| MONDAY, SEPTEMBER 25, 2023 | | |
|----------------------------|----------------|---------|
| 6:00 P.M 9:00 P.M. | Ingersoll Rand | 335 A-C |
| | | |

| TUESDAY, SEPTEMBER 26, 2023 | | |
|----------------------------------|--------------------------------|-------------------|
| 7:00 P.M 10:00 P.M. Reception | Rotating Machinery Services | 335 A-C Reception |

HALE PAGE AD



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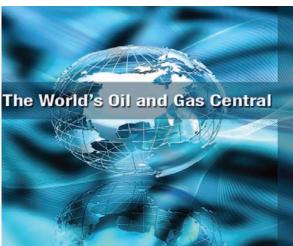
TODAY!





LOCATED IN THE FRONT OF EXHIBIT HALL C - OPEN TO EXHIBITOR PRESENTATIONS

| TUESDAY, SEPTEMBER 26, 2023 | | |
|-----------------------------|--|--|
| 3:00 P.M 3:50 P.M. | Applied Flow Technology – Nick Vastine | |
| 5.00 F.IVI 5.50 F.IVI. | "Can You Trust the Joukowsky Equation for Water Hammer?" | |
| 4:00 P.M 4:20 P.M | Burckhardt Compression (US) Inc Greg Griggs | |
| | "Industrial Metaverse" | |
| | L.A. Turbine – Troy O'Steen | |
| 4:30 P.M 4:50 P.M. | "Retrofitting AMB Turboexpanders for any OEM" | |
| 5:00 P.M 5:20 P.M. | Velo3D - Sid Raje | |
| | "Functional Benefits of Additively Manufactured Turbomachinery Impellers" | |



Worldoils is a company that combines the power of marketing as well as the in-house expertise for the Oil, Gas, Offshore and the Maritime industries. Worldoils' web portal www.worldoils. com has become a truly central platform for visitors who need information regarding oil and gas products and services, research, training, conferences, news and events as well as a popular advertising base for providers of Oil, Gas, Marine and Offshore services. Worldoils has also launched the jobs system and a marketplace. In the recent months, Worldoils has strengthened its position as a fast developing central place for buying and selling of land rigs, offshore rigs, barge rigs and other oilfield and subsea equipment.



WEDNESDAY, SEPTEMBER 27TH 12:00 PM - 1:30 PM

Must register to attend

WHAT'S INCLUDED?

- A forum for women of TPS to share experiences and challenges in the industry and celebrate women in STEM fields
- Plated Lunch
- Game and Prizes
- Photobooth and fun
- Both women and men are encouraged to attend.





TPS WELCOMES

- NATALIE SMITH, PH.D, SOUTHWEST RESEARCH INSTITUTE
- DR. MARCIA COOPER, TEXAS A&M TURBOMACHINERY LABORATORY





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Learn How EASA Can Help You

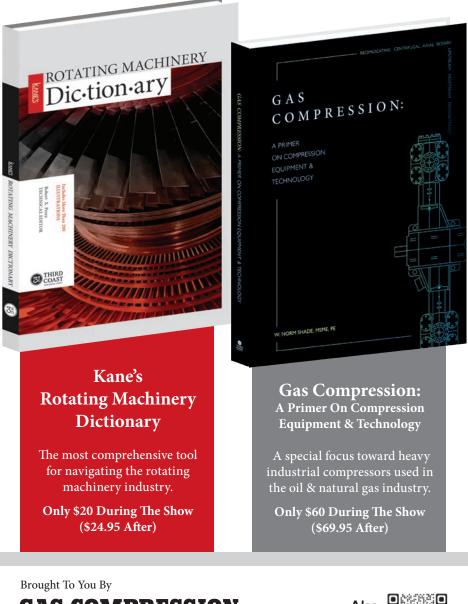
- ANSI/EASA AR100: The standard for repair of rotating electrical apparatus
- Technical Resources
- Training for Your Employees
- Electromechanical Repair Technician Certificate Program (Coming in January 2024)
- Electric Motor Repair Tips Video Series

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Also Available Online







Business Networking Future Technologies

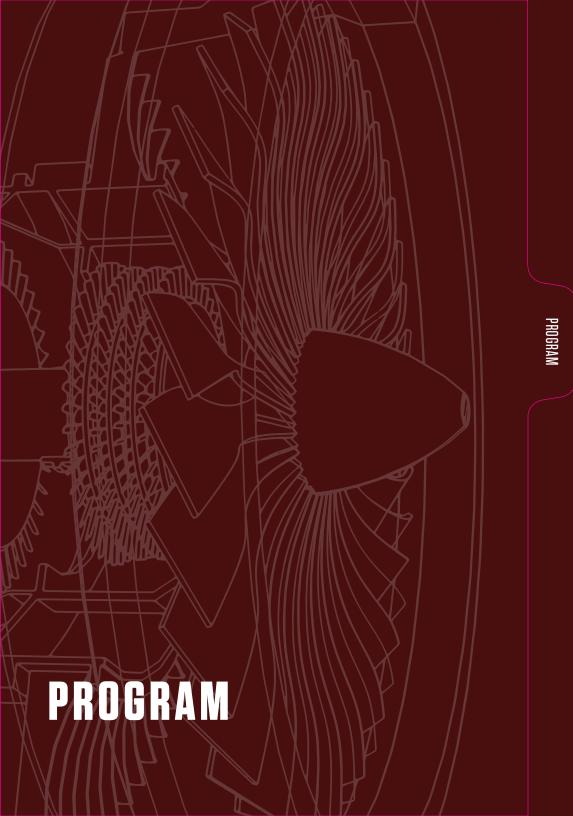
Global Reach

www.gpps.global Dissemination of Research

GPPS International **Technical Conference**

Hong Kong October 17th - 19th, 2023

+ CFD Workshop October 16th



DOWNLOAD THE TPS MOBILE APP

Search for and download the **Turbomachinery and Pump Symposia** mobile app from your favorite app store.

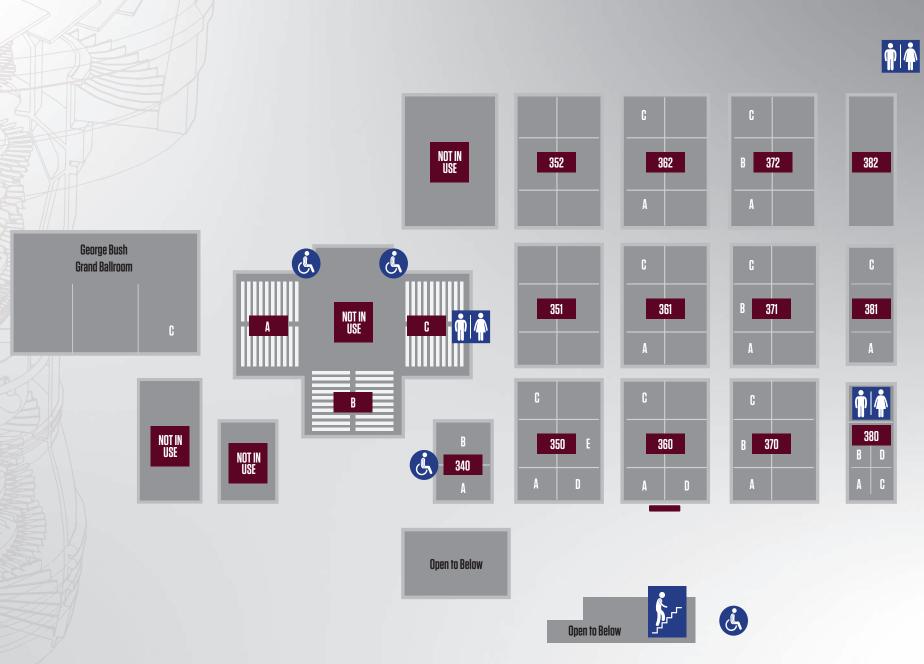
- Search "Turbomachinery and Pump" and select the TPS 2023 app from the results.
- 2. Download the app.
- Your username is your registered email, and the password is TURBOPUMP.

Find exhibiting company listings, a map of the exhibit floor, and the full program, plus create your own schedule for TPS 2023.









ADVISORY COMMITTEE MEMBERS

Our Advisory Committee is composed of industry experts who volunteer their time to oversee the success of the Turbomachinery and Pump Symposia. We extend our gratitude to the members of our Turbo and Pump Advisory Committees, whose dedication, time, and expertise have been instrumental in maintaining the high standards of our continuing education program. Thank you all for your invaluable contributions, support, and commitment to excellence.

WHO MAKES UP OUR COMMITTEE

Every individual is a member of the industrial world that either uses, manufactures, or supports the use of turbomachinery and pump systems. Members are typically consultants, contractors, manufacturers, or end users.

MATERIALS REVIEWED

LECTURES

A lecture is a presentation of a technical paper detailing innovative turbomachinery or reciprocating compressor technology or methodology.

TUTORIALS

A tutorial is a mini short course/workshop presenting a specific technical topic. It is a teaching process directed at the practicing engineer.

CASE STUDY

A case study is a short informational presentation describing the successful implementation of established technology or methodology to solve a real-world problem.

SHORT COURSE

A short course is a full-day training session presented concurrently with other short courses on the first day of the Symposia.

A MORE DETAILED SCHEDULE

SEARCH for and **DOWNLOAD** our TURBOMACHINERY & PUMP SYMPOSIA **MOBILE APP** from your preferred app store

YOUR **REGISTERED EMAIL** IS YOUR **Username**, and the **Password** is the **ID Number** in your confirmation email



ASIA TURBOMACHINERY & PUMP SYMPOSIUM 2024

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Kuala Lumpur Convention Centre | Kuala Lumpur, Malaysia

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TURBO ADVISORY COMMITTEE

The 52nd Turbomachinery and 39th Pump Symposia is hosted by the Turbomachinery Laboratory of the Texas A&M Engineering Experiment Station, The Texas A&M University System. The Advisory Committee for the symposia are composed of engineers from various user and manufacturing corporations throughout the U.S. and abroad. The presenters of Lectures, Tutorials, and Case Studies as well as the Discussion Group Leaders are leaders from the fluidhandling-equipment community. The Advisory Committee is greatly indebted to these individuals for their participation and outstanding contributions.

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MONDAY, SEPTEMBER 25 SHORT COURSE DESCRIPTIONS

8:30 A.M.

PT 1 - VIBRATION PROBLEMS AND SOLUTIONS IN PUMPS AND TURBOMACHINERY

Instructors: William Marscher, Eric Olson, Maki Onari, Paul Boyadjis (Mechanical Solutions, Inc.)

This course presents analysis and testing methods for pumps and turbomachinery. Focus is on centrifugal pumps of all types, centrifugal compressors, axial compressors, fans, steam turbines and gas turbines. Rotordynamics and bladed disk vibration are included as modules as well as discussion of fluid-induced vibration (e.g. rotating stall and blade pass frequencies), acoustics, and mechanically induced vibration (imbalance misalignment, rubs, looseness). Troubleshooting methods and fixes are discussed with many detailed case histories.

P2 - MECHANICAL SEAL FUNDAMENTALS

Instructors: Mike Huebner (Consultant), Steven Bullen (A. W. Chesterton Co.) Brian Kalfrin (John Crane), Christopher Ropp (Flowserve)

This short course is designed for all personnel that interacts with mechanical seals such as engineers, users, installers, purchasers, reliability engineers, and other industrial plant functions. It starts with basic operating and then goes into greater details of all aspects relating to the use and obtaining maximum operating life for dynamic shaft sealing.

P3 - PUMPS 101

Instructors: Dan Wood (Chemours), July Hodgson

This course is aimed at technical professionals who need a broad-based introduction to basic pump selection, application and operation. This course starts with the basics and builds to provide a full understanding of centrifugal, rotary and reciprocating pumps. The course will include the following topics: centrifugal, rotary and reciprocating pump similarities/differences; centrifugal, rotary and reciprocating pump configurations; nine fundamental principles for reliable pump operation; understanding pump curves; developing system curves; choosing a type of pump for a specific application. The course will answer the question ?What are the things I need to worry about when selecting, specifying and operating pumps?? At the completion of the course, the attendees will hold a strong understanding of basic concepts. This knowledge will act as a springboard to further growth understanding of more complex pump concepts. An emphasis is placed on providing useful information with minimal theory and thus, comprehension of the information presented requires little to no mathematical skills in hydraulic or mechanical design.

P4 - MOTOR AND VFD PRINCIPLES

Instructors: Jeff Bergman (ABB), Robert Sterling (WEG)

Electric motors are a key driver within a plants rotating machinery applications. Safe and reliable operation, of the electric motor and the components that control them, are key to plant success. With the industrys push for more efficient systems with higher automation, the requirement to use electric motors with VFDs is becoming more popular. This course will educate the participant on the general function, application, installation, maintenance and troubleshooting of the electric motor and VFD as a system. It will also cover the interaction the motor and the VFD have with key turbo machinery applications.

P5 - PUMP CAVITATION - PHYSICS, PREDICTION, CONTROL, TROUBLESHOOTING

Instructors: Frank Visser (Consultant, Pump Fluid Dynamics), Bruno Schiavello (Flowserve)

This short course gives insight into roto-dynamic pump cavitation and provides deeper understanding of particulars like cavitation inception, three-percent head drop, 40,000 hours life criterion, cavitation damage potential, NPSHR scaling laws, the effect of dissolved gas, and thermodynamic effect for hot water and hydrocarbons. Empirical correlations for predicting various types of NPSHR and the use of CFD will be discussed, and suction specific speed will be critically reviewed, along with criteria for NPSHA margin. Furthermore, the effect of fluid transients and viscosity will be addressed. Cavitation damage potential will be fully explained by the "Cavitation Modes Map", which reflects fundamental insight gained since the 1940's; here in particular the striking departure in shape from the NPSH3 curve for part flows is highlighted, being a key reason of many cavitation pump problems. Attention is further devoted to Impeller Life Expectancy and Cavitation Control with modern designs tools. In conclusion, four field case studies will demonstrate the use of cavitation failure analysis and solution strategy.

P6 - API 610 12TH EDITION

Instructors: Frank Korkowski (Applied Knowledge Consulting), Roger Jones (Shell (previously)), Jeremy Cooper (Bechtel)

The course provides an in-depth review of the latest edition of the API 610 standard published as the 12th Edition in January 2021 and is recommended for technical decision makers who deal with pump selection and reliability daily. It is intended for those individuals predominantly in the oil & gas sector

in the following fields: Project engineering, Reliability Engineering, Rotating Equipment Engineering and Procurement. Other business sectors and personnel requiring knowledge or a refresher on fundamentals of centrifugal pumps design and operation (as required by API 610) will also find this course helpful. Using API 610 data sheets as a guide is how this course is constructed and demonstrates how specific specification requirements tie-into the data sheets. TPS will provide a hard copy of the standard as part of the class materials.

P7 - KNOW YOUR SYSTEM CURVES!

Instructors: Scott Shults (ITT)

Pumps operate at the intersection of the pump and system curves, but system curves are often poorly understood. This course focuses on hydraulics and troubleshooting – reading pump curves, developing system curves, and grasping the effect of system curves on pump reliability and flow. It is intended for those who select, use, and/or perform root cause analysis of centrifugal pumps. It is an ideal course for reliability/rotating equipment engineers and applications engineers, from entry level through late career. Part 1: Pump Hydraulics – mastering pump curves, the significance of the best efficiency point, the link between flow and reliability. Part 2: System Hydraulics – building a system curve, flat vs steep system curves. Part 3: Pump/System Interaction – parallel/series pump operation, undersized and oversized pumps, cavitation, matching a pump and system. Part 4: Special Topics – specific speed, calculating NPSHA, affinity laws. This course draws heavily on field experience and includes numerous examples of how to solve real-life end user reliability problems.

P8 - PUMP PIPING SYSTEM DESIGN TO AVOID VIBRATION AND FATIGUE FAILURE

The goal of this short course is to provide participants with design approaches and industry best practices to avoid vibration and fatigue failures of piping systems for reciprocating and centrifugal pump installations. Participants will gain an understanding of:

- Centrifugal and reciprocating working principles
- Fundamentals of vibration and pressure pulsations as related to pump systems
- Review of existing standards and industry design practices to avoid fatigue and vibration problems
- Centrifugal and reciprocating pump piping system design practices for vibration control
- Pipe support designs that are suitable for vibration service
- Project management techniques to reduce vibration risks

This short course is intended for designers, engineers, managers and technical staff involved in the design, commissioning and installation of industrial centrifugal and positive displacement pump and piping systems.

T2 - TORSIONAL ROTORDYNAMICS OF MACHINERY EQUIPMENT STRINGS

Instructors: Mark Corbo, Malcolm Leader, Chris Kulhanek, Brian Pettinato

One of the foremost concerns facing rotating equipment users today is that of torsional vibration. In contrast to lateral vibration, torsional vibration is rarely monitored. As a result, torsional failures can be especially heinous since the first symptom of a problem is often a broken shaft, gear tooth, or coupling. In the past, torsional vibration problems were considered to be rare; however the number of torsional field problems has markedly increased recently with the advent of higher power, higher complexity variable frequency drives (VFDs). The increased risk plus the difficulty of detecting incipient failures in the field makes the performance of a thorough torsional vibration analysis an essential component of the turbomachinery design process.

There are three primary objectives to this Short Course. First, it will provide users with a basic understanding of steadystate torsional vibrations, their potential for generating problems, and methodologies that are commonly used to analyze and avoid these problems. This portion of the course is aimed at younger, less experienced users, although veteran users will probably also benefit from the review. Second, it will provide users with some understanding of the more complex issues related to transient torsional vibration and acceptance based on stress analysis. Third, it will educate users on how VFDs work, and why they are a concern from a torsional standpoint. This portion will be beneficial to all users since modern VFDs are not well understood, especially by mechanical engineers.

T3 - CENTRIFUGAL COMPRESSORS 101

Instructors: Mark J. Kuzdzal (Retired) and Jay M. Koch (Siemens)

This course is aimed at engineers and technical professionals who need a broad-based introduction to centrifugal compressor design and analysis. This course starts with the basics and builds to provide a full understanding of a centrifugal compressor. The course will include the following topics: reciprocating, axial and centrifugal compressor similarities/differences; centrifugal compressor configurations; design consideration; and balancing aerodynamic, rotordynamic, and mechanical consideration. The course will answer the question "How do they work? factory testing, and future challenges. At the completion of the course, the attendees will hold a strong understanding of basic concepts. This knowledge will act as a springboard to further growth understanding of more complex centrifugal compressor concepts. An emphasis is placed on providing practical information with minimal theory. This is NOT a centrifugal compressor operations and maintenance class.

T4 - CENTRIFUGAL COMPRESSORS 201

Instructors: Jeffrey Moore (Southwest Research Institute), James Sorokes, Jay M. Koch (Retired), James Hardin (Elliott Group), Rainer Kurz (Solar Turbines)

This course supplements the Centrifugal Compressor 101 course by covering in greater detail four key areas related to compressors: aerodynamics, rotordynamics, performance and mechanical testing, and surge control. It is intended for those who attended the 101 course and wish to learn more about these topics. The course is also structured for those practicing rotating machinery engineers who have a basic understanding of the topics covered in CC101 but wish to further their understanding in these key areas.

T5 - BABBITTED BEARING OPERATION & DIAGNOSIS

Instructors: John Whalen (Consultant), Joy Brinkerhoff Patten (Solar Turbines), Elona Rista (Solar Turbines)

This course is intended for engineers and technicians working with critical rotating equipment. The course will also benefit managers and supervisors that have some rotating equipment responsibility. While most of the material is introductory, it will provide a refresher and perhaps some new information for the more experienced engineers. Those attending will learn about the fundamentals of hydrodynamic lubrication and how that is utilized with journal and thrust bearings in industrial and power generation turbomachinery. An introduction to oil analysis and API 670 instrumentation will be followed by rudimentary evaluation of data from these systems to understand the condition of bearings in operation.

T6 - OVERVIEW OF API STANDARD 614 6TH ED. - LUBRICATION, SHAFT-SEALING, AND OIL-Control systems and auxiliaries

Instructors: Kevin Kisor (MAN), Chuck Parker (G.J Oliver, Inc), Neetin Ghaisas (Fluor) and Travis Griffith (Worley Inc.)

This Short Course will cover API Standard 614, 6th Ed. (Feb. 2022) with an emphasis on changes from the 5th Ed. (April 2008).

The 6th Ed. has quite a few changes including:

- Elimination of separate chapters for general- and special-purpose lube oil systems.
- More elaborate "Configuration Codes" describing basic oil systems for different equipment types.
- Default oil system configurations referenced by other API standards such as API 610 for pumps, API 619 for screw compressors, etc.
- New topics including oil mist eliminators.

T7 - ROOT CAUSE FAILURE ANALYSIS FOR INDUSTRIAL TURBOMACHINERY

Instructors: Justin Hollingsworth, John Macha (SWRI), David Ransom (Siemens-Energy)

This class covers the formal RCFA process and provides guidance on the various steps needed to investigate failures. A first responder's job includes: observing and recording what is seen, securing all data sources, backing up all data recordings, identifying all personnel on duty, notifying all parties involved, overseeing teardown, and collecting all available evidence. Forming an RCFA team is an important part of the overall process. The team should have ownership of the problem. Defining the problem may require brainstorming and has a strong influence on the quality of an investigation.

T8 - STEAM TURBINE 101 - BASIC KNOWLEDGE OF STEAM TURBINE

Instructors: Kenichi Nishiyama and Piotr Smietana (MHI)

The class will provide the attendee with an overview of advanced steam turbine design, applications, operation, and maintenance topics. The topics will also cover advanced turbine design practices to optimize steam supply efficiency and how to maintain equipment reliability. The class will cover areas related to the interactions between the multiple critical components of a steam turbine and how to ensure long term operability. The course is intended and structured for those who already have a basic understanding of rotating machinery and wish to further their understanding in key steam turbine technology areas with a primary focus on oil & gas applications.

T9 - TURBOMACHINERY DESIGN AND ANALYSIS

Instructors: Jason Wilkes, Jeff Moore, Tommy Kerr, Aaron Rimpel, Natalie Smith (SwRI) and Adolfo Delgado (TAMU)

EXHIBITORS



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WHO: All attendees.

WHAT: Use the Checklist and tag us on Social WHEN: Tuesday and Wednesday - 2:00 P.M. - 5:00 P.M. WHERE: Exhibition Floor and Turbo Lab Booth 2022

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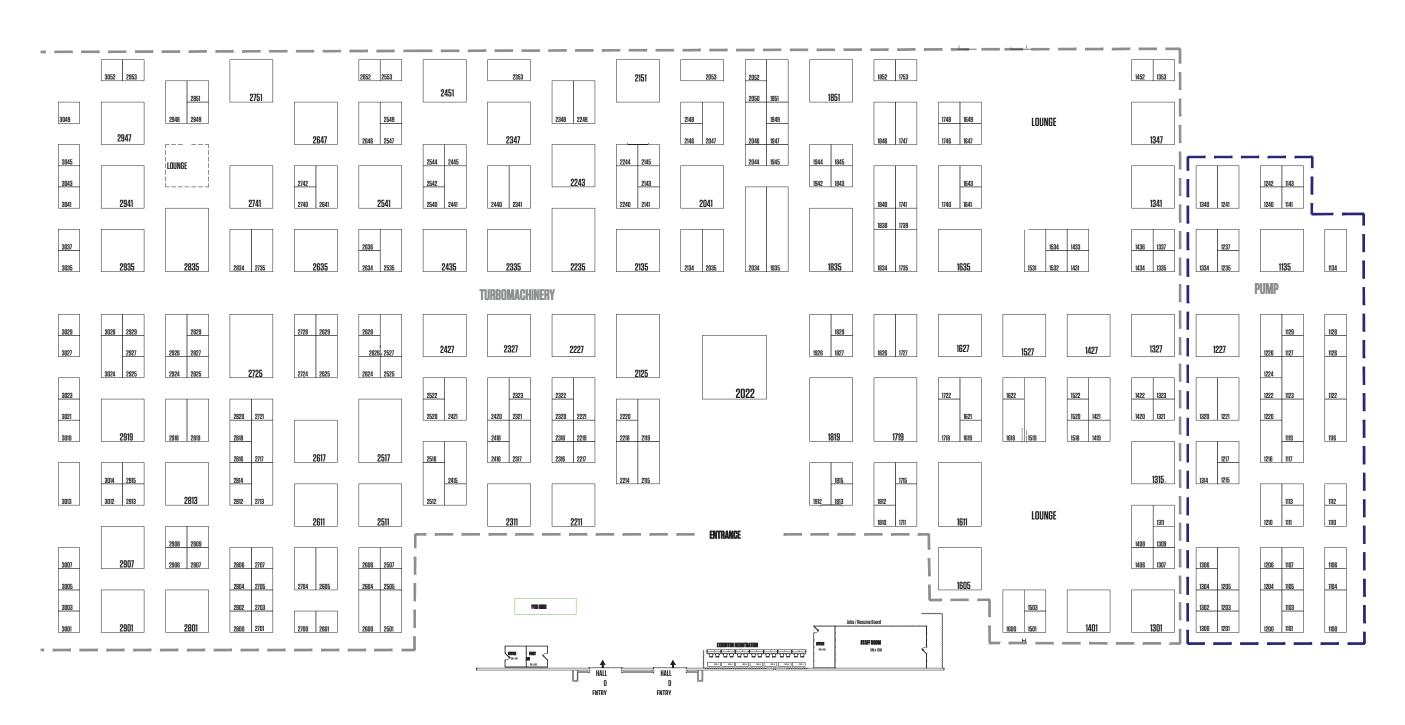
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EXHIBITOR DESCRIPTIONS

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All Cert Training, Inc. offers a variety of diverse training and assessment programs to prepare and certify employees for their respective careers. Customized training programs allow students to create a personalized education tailormade to their needs. With NCCER affiliation, ACT provides nationally acclaimed safety training services. Specialized certification programs for crane, rigging, and signal persons provides multi-level knowledge-based and hands-on learning opportunities. All Cert Training is a resource for students and employers seeking to assure safety in the workplace and create a well-trained workforce.

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Axis Mechanical Group is a millwright company providing turnkey solutions for installation, maintenance, repair, overhaul, or upgrade of industrial rotating and reciprocating equipment for the petrochemical industry.

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5565 Maudlin Street Houston, TX 77087 USA PH: 713-644-2181 | FX: 713-644-1257 www.chmpgrp.com

Champion Hi-Tech Mfg. Co., Inc. manufactures a complete line of mechanical seals, auxiliary equipment, and gaskets. Champion's strength is their mechanical seals designed for high pressure and temperature applications. These specialty seals are complemented by a full line of mechanical seals used to meet standard applications in operations worldwide. Champion is the champion of innovation and reliability.

CINCINNATI GEARING SYSTEMS

5757 Mariemont Ave. Cincinnati, OH 45227 USA PH: 513-527-8600 www.cincinnatigearingsystems.com

CINCINNATI GEARING SYSTEMS Inc. is a recognized leader in precision power transmission design. More than just a gear manufacturer, CGS offers customers over 100 years of experience in producing high quality, reliable and cost effective gear units for a wide range of power transmission applications. Configurations: Epicyclic Gear Units, Multiple Pinion Gear Units, Parallel Shaft Designs, Vertical and Horizontal Offsets, Dual and Single Input, Hybrid Designs, Single & Double Helical, Spur Gears. API 613, API 617.

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

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COBEY

1 Ship Canal Parkway Buffalo, NY 14218 USA PH: 716-362-9550 www.cobey.com

Cobey designs and manufactures modular piping packages and auxiliary equipment for the petrochemical, energy, oil & gas, and air separation industries. Engineered products such as lube oil consoles, dry gas seal panels, rundown tanks and rotating equipment packages are custom designed in accordance with customer specifications and applicable ISO/API standards.

COMPRESSOR & TURBINE SERVICES, LLC

901 Old Genoa Red Bluff Road Houston, TX 77034 USA PH: 281-598-1873 www.compressorandturbineservices.com

Compressor and Turbine Services, LLC is a service and repair company in the Houston area that specializes in providing quality rotating equipment repair, engineering services, and customer service to the world's largest corporations. It is our goal to operate with honesty and integrity, and to provide our customers with the best balance of experience, innovation, quality and value.

CONCEPTS NREC

217 Billings Farm Road White River Junction, VT 05001 USA PH: 603-866-9594 www.conceptsnrec.com

For over 65 years, Concepts NREC has been a strategic partner to many of the world's leading manufacturers seeking to improve the performance and manufacturability of their turbomachinery components. We help our clients push past the boundaries of what has been done to explore the possibilities of what can be done. Solutions include: Design audits and scoping studies, Complete original engineering designs, In-house laboratory testing and R&D, Engineering optimization, Computer Aided Engineering (CAE) software, Computer Aided Manufacturing (CAM) software, Prototype and production manufacturing, Proprietary products manufacturing, Reverse engineering, Professional development courses.

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CONHAGEN

203 Texas Ave La Marque, TX 77568 USA PH: 409-938-4226 www.conhagen.com

Conhagen Inc specializes in Repairs, Re-Rates, and Redesign of Rotating Equipment. We offer turnkey services utilizing our Field Service crews. We have engineers on staff in all locations. With facilities in Texas, Louisiana, and California. Please stop and visit us at our booth.

CONTINENTAL CONTROLS CORPORATION

7710 Kenamar Ct San Diego, CA 92121 USA PH: 858-453-9880 www.continentalcontrols.com

Leading supplier of complete fuel train and fuel control valves for Gas Turbines. Fuel Controls for 1 MW to 60 MW gas turbines. Liquid, Gas, and Blended gas fuel valves and mixers. CCC also offers a pilot valve configured specifically for DLE configurations. Stop by to see the latest in CCC's fuel train/shut-off valve manifolds.

COOLING TECHNOLOGY INSTITUTE

3845 Cypress Creek Parkway #420 Houston, TX 77268 USA PH: 281-583-4087 www.cti.org

As a broad based industry association, our mission is to advocate and promote, for the benefit of the public, the use of all environmentally responsible, cooling technologies, such as wet cooling towers, air-cooled condensers, dry coolers, indirect cooling, and hybrid systems, by encouraging: Education on these technologies. Development of codes, standards, and guidelines. Development, use, and oversight of independent performance verification and certification programs. Research to improve these technologies. Advocacy and dialog on the benefits of cooling technologies with Government Agencies and other organizations with shared interests. Technical information exchange.

3001

COUPLING CORPORATION OF AMERICA

250 N Main Street Jacobus, PA 17407 USA PH: 717-428-0570 | FX: 717-428-2865 www.couplingcorp.com

Since 1968, CouplingCorp has provided high-performance flexible couplings for refineries, process plants, and power plants. CouplingCorp also designs and manufactures the unique Anderson Clamp Hub, which is a keyless interference hub. It can be easily removed and installed without heat or hydraulics. Also, look for the new Vertical Clamp Coupling which can help reduce seal wear on vertical pumps.

CRYOSTAR USA LLC

5897 Colony Drive Bethlehem, PA 18017 USA PH: 610-470-6800 FX: 484-281-3402 www.cryostar.com

Cryostar supplies Turbo-Expanders for natural gas processing, PDH plants, ethylene and fertilizer plants. Particularly robust, reliable and highly efficient, they are built to the latest standards such as API 617. Cryostar provides also Process Pumps and Turbo-Expanders for industrial gas applications, offering increased reliability and product life, operational safety, ease of installation and reduced maintenance costs. Cryostar's wide range of Turbo-Expanders is used for all types of gases, with a choice of brakes adapted to every process (ASU, NLU, and N2 generators). Four Cryostar USA locations : Houston (TX), Whittier (CA), Bethlehem (PA) and Aurora (IL) for sales, after sales, maintenance and production capabilities.

CUSTOM ENGINEERING COMPANY

2800 McClelland Ave Erie, PA 16514 USA PH: 814-898-2800 www.customeng.com

Custom Engineering is a fully integrated, ISO certified contract manufacturing and machining company. We specialize in large scale contract fabrication and manufacturing components up to 160,000 lbs. Our facility located in Erie, PA, has over 200,000 square feet of manufacturing space and is ideally suited to produce both short and long run components. Custom is a leading supplier of heavy fabrication, machining, and assembly of large weldments to a wide variety of world-class companies across various industries. Custom specializes in build large baseplates/soleplates.

CUTSFORTH INC

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5160 Industrial Pl Ferndale, WA 98248 USA PH: 360-810-3155

D&S ENGINEERED PRODUCTS

1231 County St Attleboro, MA 2703 USA PH: 508-431-1228 | FX: 508-222-6555 www.d-sep.com

D&S Engineered Products designs and manufactures engineered products such as fluid film (hydrodynamic) journal and thrust bearings, and squeeze film dampers for the industrial, oil and gas, and energy sectors worldwide. We also provide vacuum brazing and hard facing service. All of the products are designed and built to suit a particular application. Our engineering staff evaluates each application and offers the best product using our more than 30 years of industry experience. Product is fabricated with quality in our US based, ISO 9001 certified manufacturing facility in a timely and cost-effective manner.

DELTA FLUID SYSTEMS INC.

358 Dewitt Rd. L8E 2T2 ON, Canada PH: 905-664-4333 www.deltafluidsystems.com

Designers and manufacturers of API 682 Mechanical Seal Support Systems (Seal Flush Plans 21/23, 32, 52, 53A, 53B, 54, 55, 65A, 65B, 72, 74, 75, 76) and custom pressure vessels, and API 614 Lube Oil Systems. ASME SECTION VIII DIV 1 / ASME U STAMP certified, ISO 9001:2015 registered.

DEWESOFT

10730 Logan Street Whitehouse, OH 43571 USA PH: 855-339-3669 www.dewesoft.com

DEWESoft, offers a full suite of hardware for in-vehicle & lab applications. Scalable from 1-1000's of channels our instruments are small USB & EtherCat devices, stand-alone battery-powered systems, rack-mounted configurations, & ruggedized field-ready solutions. Powered by DEWESoft X software, we acquire & control many multi-domain test sets that include analog in/out, digital in/out, video, CAN, FlexRay, XCP, GPS, & more.

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DICKOW PUMP COMPANY, INC.

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1738 Sands Place #200 Marietta, GA 30067 USA PH: 770-952-7903 www.dickow.com

Dickow Pump Company has manufactured centrifugal pumps for more than 115 years, always with an emphasis on precision, longevity in service and hydraulic efficiency. Today we offer the broadest and most technologically advanced range of magnetic drive seal-less pumps. Dickow Pump Company is a major supplier of pumps for the process industries including the following engineered products. NMB: Close coupled seal-less process pumps. NCR: API 610 PRM: API 685 NMX: Seal-less high temperature pumps especially designed for handling heat transfer fluids with no cooling water required. SCM: Seal-less side channel pumps for low capacities and high differential heads. HZM: Seal-less.

DIESEL & GAS TURBINE WORLDWIDE/COMPRESSORTECH2

20855 Watertown Road, Suite 220 Waukesha, WI 53150 USA PH: 262-754-4131 | FX: 262-754-4175 www.dieselgasturbine.com

Diesel & Gas Turbine Worldwide (www.dieselgasturbine.com) is a global website and weekly e-newsletter covering large reciprocating and rotating engine products and technologies used in land-based and offshore power generation and oil & gas, as well as marine propulsion. COMPRESSORTECH2 magazine is published 10 times a year and covers natural gas and process gas machinery and the compressors, drivers and controls used in offshore and land-based gas compression applications. Since 1935, Diesel Progress has been providing the news for the construction and agriculture, power generation and commercial vehicle equipment sectors in North America. The magazine is published 10 times a year.

DONGYING HIGHYOND INVESTMENT CASTING CO., LTD.

17 Chuanghui Road, Niuzhuang Indurstrial Park Dongying 257000 Shandong, China PH: 86-546-7770906 www.highyondcasting.com

Highyond integrates mold making, casting, processing and surface treatment, providing customers with one-stop service. Products from casting, heat treatment, machining, surface treatment and testing, are all quality assurance by domestic and foreign first-line brand equipment; product unit weight can be produced from 0.002kg-200kg, with a strong comprehensive production advantage of pump and valve parts.

DOUGLAS ELECTRICAL COMPONENTS

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Douglas Electrical Components manufactures electrical feedthroughs, seals, and wire bushings for hazardous locations in custom and standard packages. Our products include fully packaged and cured epoxy designed for both hermetic vacuum and positive pressure environments. Customers can improve legacy designs using cement-based seals, prone to cracking and failure over time. Our design capabilities allow us to offer both the mechanical hermetic seal against the explosive atmosphere and reliable process sealing in applications that experience pressurized environments such as compressors, cryogenics, hydraulics, pumps, fuel controls, turbines, and instrumentation.

DRAKE CONTROLS

8731 Fallbrook Drive Houston, TX 77064 USA PH: 713-996-0190 FX: 713-996-0190 www.drakecontrols.com

Drake Controls is one of Woodward's largest channel partners globally. Our company is a Woodward Recognized Turbine Retrofitter as well as the Authorized Woodward Sales & Service Center for Texas, California, Oklahoma, Kansas, New Mexico & Nevada. In addition to our U.S. operations Drake Controls is also responsible for Woodward products and services within the country of Mexico as well as Brazil with our JV affiliate DrakePM. Drake Controls also represents Dynalco Controls throughout our territories. Our goal at Drake Controls is to provide quality products, solutions and technical services to the Turbomachinery industry and our customers.

DYNAFLOW RESEARCH GROUP

Laan van Oversteen 20 Rijswijk 2289 CX Zuid-Holland, Netherlands PH: 713-412-9733 www.dynaflow.com

BOSpulse (www.bospulse.com) is a comprehensive software solution for performing pulsation analyses of piping systems involving reciprocating equipment such as reciprocating compressors (API 618) and reciprocating pumps (API 674). It enables engineers to model both common and custom reciprocating equipment and the attached piping, to perform pulsation analyses, to check the results against the allowable pressure and shaking force amplitudes prescribed by the API standards, and to assess the impact of the shaking forces on the structural response of the piping system

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E+A

Bachstrasse 10 Möhlin 4313 Aargau, Switzerland PH: 925-685-0227 www.eandausa.com

e+a makes rotors and stators that OEMs use to build motors and generators for embedded high-speed, high-power turbo-machinery applications including: machine tool spindles, micro-turbine generators, waste-water & fuel cell blowers, direct drive gearbox replacements, compressors & turbochargers, chillers, energy storage systems, HVAC compressors, LNG & LH2 pumps, automotive traction motors and range extenders, concrete cutting, aircraft generators & APU's, flywheel energy storage, etc. e+a rotor/stator sets are Induction and Permanent Magnet motors and generators ranging from a few KW at 500K+ RPM through 1.6MW at 25K RPM. e+a offers both Low Voltage (<1000V) and Medium Voltage devices (3.3kV, 6.6kV..).

1110 Ulrich Road Tomball, TX 77375 USA PH: 713-290-8811 www.eaglegasket.com



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EagleBurgmann is a leading international specialist in industrial sealing technology. We combine innovative technologies, digital solutions and our passion to create sophisticated and reliable sealing systems. Our products help make entire industries safer and more sustainable. 5,600 employees create added value for our customers around the world with their enthusiasm and competence. EagleBurgmann is a joint venture between the German Freudenberg Group and the Japanese Eagle Industry Group.

EASA

1331 Baur Blvd Saint Louis, MO 63132 USA PH: 314-993-2220 | FX: 314-993-1269

The Electrical Apparatus Service Association, Inc. (EASA) is an international trade organization of more than 1,700 electromechanical sales and service firms in nearly 70 countries.

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EAGLE GASKET



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Eastern Alloy Inc. custom designs and manufactures nitrogen filled shipping and long term storage containers. The protective containers are designed to be stored horizontal and vertical. Equipment shipped and stored include; Rotors, Bundles, Expanders, Gear Sets, Armatures, Couplings, Gear Boxes, Seals, Bearings, Pumps and many other components.

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EcoTech is your single source for industrial solutions, specializing in pumps, valves, mechanical seals, automatic lubrication, and more. We are exclusive partners for CP magnetic driven pumps in the US market (TX, LA, MS, AL, GA, FL). CP Pumpen AG is a highly innovative Swiss manufacturer of high-safety, hermetically sealed and efficient centrifugal pumps/magnetic driven pumps made of stainless steel, special alloys, PFA-lined, solid PTFE or ceramic-lined. CP pumps are designed for aggressive, hazardous liquids in chemical, pharmaceutical, petrochemical, biotechnological processes, or for sterile processes in the food and beverage industry.

ELLIOTT GROUP

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Elliott Group designs, manufactures, and services compressors, steam turbines, lubrication and seal systems, and cryogenic pumps and expanders for oil & gas, LNG, refining, petrochemicals, and power applications. Elliott's global service network provides installation, maintenance, repair, overhauls, and rerate services for Elliott and non-Elliott equipment. Elliott employs 2500 people in 32 global locations. Elliott Group is a subsidiary of Ebara Corporation, Tokyo, Japan.

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Emerson's comprehensive line of condition monitoring technologies help improve reliability in your facility and can contribute to your plant's digital transformation. Technologies include protection plus prediction online system, wireless transmitters, and route-based vibration data collectors/analyzers. Data is integrated to AMS Machine Works and connects to enterprise platforms for expanded visibility, collaboration, and closed loop reliability for critical assets.

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Empowering Pumps & Equipment is the information and connection hub for the pump and related equipment industries. The mission is to Connect, Inform, and Educate the industry through publishing The Right Content, To the Right Audience, At the Right Time! As an Empowering Brands property, we aim to be strategic business partners to our clients, creating tailored programs to support our clients' marketing campaigns and providing flexible and responsive service. With broad industry knowledge and a respected brand, Empowering Pumps & Equipment provides publishing opportunities, content development, social media marketing, strategy, and execution options to empower our clients to costeffectively reach and engage with a diverse audience.

ENERGY CONTROL TECHNOLOGIES, INC.

P.O. Box 681032 Houston, TX 77268 USA PH: 281-309-8164 | FX: 515-223-1638 www.ectpac.com

Energy Control Technologies (ECT) delivers control solutions for turbocompressors, steam turbines, gas turbines, turboexpanders, screw compressors, and reciprocating compressors. Our technology uses Rockwell Automation Allen-Bradley ControlLogix and CompactLogix, Siemens or Honeywell hardware platforms in the Oil & Gas, Industrial/Manufacturing, and Biofuels markets including full duplex and SIL 2 systems. ECT solutions increase energy efficiency and production while improving machine protection. Solutions include: surge control, performance control, quench, loadsharing, steam turbine speed and extraction control, overspeed trip systems, gas turbine fuel control and sequencing, turboexpander control, logic, vibration protection, plant air network control, and simulation services.

ENERGY TECH REVIEW

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Engineering Dynamics Inc. is an independent engineering firm serving industry with the expert technical support to solve and prevent dynamics problems. Founded in 1982, EDI has become a recognized leader in providing engineering expertise in the petrochemical, refinery, power generating & gas processing industries. Wide variety of capabilities & advanced instrumentation.

EQUITY ENGINEERING GROUP, THE

20600 Chagrin Blvd, Suite 1200 Shaker Hts, OH 44122 USA PH: 216-283-9519 www.e2g.com

The Equity Engineering Group, Inc. leverages technology and industry experience to extend the safe operating life of rotating machinery, piping, and structures by helping to prevent future failures, increase efficiencies, maximize reliability, and minimize damage. The structural vibration and rotating equipment team combines field testing, data analysis, and advanced computational analysis to provide practical and actionable recommendations to solve complex problems. E2G helps its clients improve rotating equipment reliability and mechanical integrity with predictive and preventive maintenance programs.

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An innovative company that develops vibration and condition monitoring technology to maximize your production with products that allow you to reduce unplanned downtime. Erbessd Instruments offers a full suite of dynamic balancing machines, wireless vibration analysis equipment, laser alignment technology and condition monitoring tools that are both affordable and user-friendly.

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We deliver a fully comprehensive, solution-oriented support service that aims to maximize the life cycle value of your assets. Our unique depth, resources and manpower allow us to provide safe, reliable and cost-effective solutions that reduce your cost of ownership. Our field services, combined with in-house shop repair and manufacturing capabilities, allow us to be a single-source provider for your rotating equipment needs.

F

F.W. GARTNER THERMAL SPRAYING & CURTISS-WRIGHT

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FW Gartner (a business unit of Curtiss Wright Surface Technologies) is an ISO 9001 (2015) qualified provider of a broad range of surface technologies utilized for the protection and reclamation of critical components, and a fixture in the Houston area since 1923. By combining FW Gartner's Thermal Spray, Laser/PTA cladding, comprehensive machining and grinding shop, full metallographic lab, staff metallurgist and on-site third party QC inspection, FW Gartner is ready to partner with you in delivering the innovative solutions you need and the company's many customers, across a broad range of industries, have come to expect.

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FasTrac Construction Products is a renowned leader in the construction industry, specializing in innovative and high-quality construction materials and solutions. With an unwavering commitment to excellence, FasTrac offers an extensive range of cutting-edge products including epoxy grout, cement grout and structural repair products designed to streamline construction processes and enhance project efficiency. FasTrac's products deliver exceptional strength, durability, and rapid set times, enabling contractors to complete projects faster while upholding the highest quality standards. With a strong emphasis on customer satisfaction and industry expertise, FasTrac Construction Products is the trusted choice for construction professionals seeking superior construction materials and effective solutions.

FIMA MASCHINENBAU GMBH

Oberfischacher Str. 58 Obersontheim, DE 74523 Baden-Württemberg, Germany PH: (+1) 639-994-3536 www.fima.de/en/

The FIMA product range includes custom-engineered rotating equipment for application specific compressors and blowers for the process gas and related industries. As the leading international specialist for gas flow technologies, FIMA is committed to the highest level of quality and technical competency for engineering, project planning, manufacturing and customer service.

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A worldwide provider of high performance, versatile, specified non-shrink cement and epoxy based construction solutions for use in the industrial, infrastructure and marine markets. Five Star's products include versatile precision, non-shrink grouts and structural repair products; highly chemical resistant coatings, patches and grouts; pile and column repair systems; concrete restoration and advanced vibration dampening products, waterproof coatings, adhesives and machinery foundation systems for rapid turnaround.

3043

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115 Technology Drive A201 Trumbull, CT 06611 USA PH: 203-268-5961 | FX: 203-459-0301 www.flender-graff.com

Flender-Graffenstaden has acquired the know-how and the experience to be a leader in the field of high speed gears. FG Gears are used in all processes in power plants, refineries, offshore and onshore oil and gas installations, petrochemical and industrial process plants. FG provides turbo parallel shafts and integral gear units with centerline distances ranging from 150 to 1500 mm. Designed to meet specific customer needs, our products can reach powers up to 110 MW. With local support for Application Engineering and Field service support for startup and commissioning through FGGS Corp.

FLEXASEAL ENGINEERED SEALS AND SYSTEMS, LLC

2611

291 Hurricane Lane Williston, VT 05495 USA PH: 802-857-4500 www.flexaseal.com

Flex-A-Seal, Inc. started in December 1983. In 2020, Flex-A-Seal and Momentum Engineered Systems merged creating Flexaseal Engineered Seals and Systems, LLC. Flexaseal has a worldwide presence with sales agents and distributors in over 50 countries. Flexaseal core commitment is to be at the forefront of the industry's technical advances. Our facilities contain state of the art bellows welding capabilities, CNC machining centers, quality control standards, and extensive inventory systems. We also offer seal repair capabilities to refurbish not only our seals, but our competitors' as well. Our mission is to supply our customers with products of the highest quality.

FLEXELEMENT

8889 West Monroe Road Houston, TX 77061 USA PH: 713-910-3839 | FX: 713-910-0223 www.flexelement.com

Since its beginning in 1991, FlexElement has built a reputation for outstanding quality and customer service as experts in the technical design, manufacturing, and repair of power transmission couplings for critical turbomachinery. We are an engineering, manufacturing and service company that provides API 671-compliant high performance power transmission couplings and related services for critical turbomachinery worldwide. FlexElement offers industry-proven flexible disc, dry coupling designs that maximize machine uptime, providing years of maintenance-free service and reliability. Our coupling re-certification program offers timely and cost-effective refurbishment to our couplings as well as other makes of coupling. The refurbishment includes cleaning, visual and dimensional inspection, non-destructive examination, repairs and dynamic balancing in accordance with API 671. At FlexElement, rapid response and superior service are the standard.

FLOWDY

5-2, 11, Changwon-daero 363beon-gil Uichang-gu, Changwon-Si 51392 South Korea PH: +82-70-4178-3377 | FX: +82-55-251-3378 www.flowdy.co.kr

Our FLOWDY company produces components that are made up of the core of steam turbines and gas turbines in Nuclear, Hydro Energy, Thermal Energy and Combined-Cycle Power Plant.

FLOWSERVE CORPORATION

5215 N OConnor Blvd, Suite 700 Irving, TX 75039 USA PH: 713-374-7109 www.flowserve.com

Flowserve Corporation is one of the world's leading providers of fluid motion and control products and services. Operating in more than 55 countries, the company produces a wide variety of engineered and industrial pumps, seals, valves, and specialty equipment. Flowserve also provides a broad range of consultative, engineering and technical support services. Primary markets served include: oil and gas; power generation; chemical; water resources; mining and ore processing; and general industries. More information about Flowserve can be obtained by visiting the company's website at www.flowserve.com.

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Testing and measurement tools for manufacturing companies as well as CMMS software.

FOX ROTATING EQUIPMENT SOLUTIONS

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FoxRES Engineering Services is staffed by highly experienced rotating equipment engineers and technical specialists, which allows us to offer comprehensive technical advisory services across the full product life cycle, from pre-FEED to equipment decommissioning. The FoxRES team has hundreds of years of combined experience with centrifugal and reciprocating compressors, steam turbines, and related auxiliary systems. FoxRES has the necessary expertise to satisfy all of your rotating equipment advisory requirements.

FS-ELLIOTT

5710 Mellon Road Export, PA 15632 USA PH: 724-387-3253 www.fs-elliott.com

FS-Elliott is a global leader in the engineering and manufacturing of oil-free, centrifugal compressors with operations in over 90 countries. Building on a 50-year tradition of excellence, FS-Elliott combines an unwavering commitment to quality with the desire for advancing technology to bring value to our customers, allowing them to increase their productivity and lower system operating costs. For more information, please visit www.fs-elliott.com.

FUSION INC.

6911 Fulton Houston, TX 77022 USA PH: 713-691-6547 | FX: 713-699-1003 www.FusionHouston.com

Fusion, Inc. is a coating & grinding facility offering HVOF, plasma and electric twin arc wire coating capabilities and is known for quick-turn repairs on rotating and reciprocating components such as turbine rotors, shafts, piston rods, impellers and crankshafts to name a few. Fusion has also become recognized for the application and finish polishing of carbide on downhole mud motor rotors and drill cones.

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GAS & AIR SYSTEMS, INC.

G

1304 Whitaker Street Hellertown, PA 18055 USA PH: 610-838-9625 | FX: 610-838-9650 www.gasair.net

Gas & Air Systems, Inc. (GAS) is the factory authorized compressor packager and distributor of Howden BC (formerly Burton Corblin) Process Gas Compressors in North America. GAS provides application and package engineering, design and fabrication. Packages incorporate Howden BC Process Piston Compressors, Metal Diaphragm Compressors, and Periflow Centrifugal Compressors. In addition, GAS maintains a large inventory of genuine, factory approved spare parts for immediate delivery, and provides qualified Field Service, troubleshooting assistance, reapplication and overhaul service.

GAS COMPRESSION MAGAZINE

15814 Champion Forest Drive, Ste 409 Houston, TX 77379 USA PH: 832-271-7300 www.gascompressionmagazine.com

Gas Compression Magazine provides in-depth coverage of the products, systems, technologies, and news that affect the global gas compression industry. Upstream, midstream, and downstream, Gas Compression Magazine is your source for gas compression news and information. Published monthly, Gas Compression Magazine is delivered to the people who manufacture, maintain, purchase, package, and teach gas compression products and systems. Offered in print and digital formats, readers can choose their preferred delivery method (or both!).

GEA NORTH AMERICA

3475 Board Road York, PA 17406 USA PH: 717-767-6411 www.gea.com

GEA's proven, world-class process refrigeration and gas compression solutions include screw compressor packages, chiller systems, condensing expertise also extends to disk-stack and decanter centrifuges, as well as gas jet compressor systems. GEA prioritizes value and functionality throughout the lifecycle of its products and service support includes parts as well as predictive & preventive maintenance. Talk with us to learn why industry-leading companies worldwide choose GEA, and how we can meet your process-critical requirements. Booth #1747, GEA - engineering for a better world.

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GOODRICH INDUSTRIAL COUPLINGS

104 Otis St. Rome, NY 13441 USA PH: 315-838-1334 | FX: 315-838-1476 www.goodrichcouplings.com

Goodrich Industrial Couplings meet the most demanding industrial gas turbine coupling requirements. Located in Upstate New York, we design, manufacture, and repair diaphragm couplings and components necessary to ensure the highest levels of operation and ensure reduced downtime. Goodrich's power transmission diaphragm couplings have set the standard for quality, reliability and performance in numerous OEM and retrofit applications meeting API-671 requirements.

GRAHAM CORPORATION

20 Florence Avenue Batavia, NY 14020 USA PH: 585-343-2216 | FX: 585-343-1097 www.graham-mfg.com

With world-renowned engineering expertise in vacuum and heat transfer technology, Graham Corporation is a designer, manufacturer, and global supplier of vacuum pumps, ejectors, vacuum systems, condensers and heat exchangers. Graham has built a reputation (over 80 years) of top-quality, reliable products, and high standards of customer service. Sold either as components or complete systems, the principal markets served are petrochemical, oil refining, & electric power generation industries, including cogeneration and geothermal plants. Graham equipment can be found in diverse applications including metal refining, pulp & paper processing, shipbuilding, desalination, food processing, pharmaceutical, refrigeration, and in HVAC service.

GRAPHALLOY

1050 Nepperhan Ave. Yonkers, NY 10703 USA PH: 914-968-8400 www.graphalloy.com





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GRAPHALLOY, a graphite/metal alloy from Graphite Metallizing Corporation, is a uniform, solid, self-lubricating bushing and bearing material for pumps that permits dry starts, survives frequent loss of suction, reduces vibration and extends pump life for continuous service. GRAPHALLOY's unique non-galling and self-lubricating properties enable a pump to handle fluids and survive upsets that would seize a metal fitted pump. Graphalloy is normally supplied in finished form and can be installed without additional machining. Graphite Metallizing has over 100 years of experience solving the toughest bearing problems. Most of our products are custom designed to unique requirements of the specific application.

GREENE TWEED

1684 South Broad Street Lansdale PA 19443 USA PH: 215-256-9521 | FX: 215-256-0189 www.gtweed.com

Greene Tweed, a leading global manufacturer of high-performance materials and products, leverages extensive engineering, design, and manufacturing expertise to provide solutions that provide exceptional performance in the challenging environments of the energy market. Combining more than 150 years of technical capabilities and commercial knowledge in a variety of markets, Greene Tweed has been at the forefront of innovation, and is proud to deliver leading products, including Chemraz®, Fusion®, Arlon®, WR®, AR®, and Xycomp®, which are sold worldwide.

GULF COAST CALIBRATION

9431 Winkler Drive Houston, TX 77017 USA PH: 979-709-0973

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H & M PLATING COMPANY, INC.

6804 La Paseo Street Houston, TX 77087 USA PH: 713-643-6516 www.hmplating.com

Reconditioning and protective coating processes utilizing electroplated hard chrome, sulfamate nickel, thermal spray, cylindrical (OD & ID) grinding and honing, phosphate coating, welding overlay and media blasting.

HAHN & CLAY, LTD.

5100 Clinton Dr. Houston, TX 77020 USA PH: 713-672-1671 | FX: 713-672-9420 www.hahnclay.com

Hahn & Clay, established in 1908, is the most versatile fabrication and machining facility in the United States. Hahn & Clay has been an industry leader in shop and field manufacturing, and repair and maintenance of industrial equipment. Hahn & Clay's Gluf Coast facility has over 250,000 square feet under roof.

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HAMMELMANN CORPORATION

436 Southpointe Drive Miamisburg, OH 45342 USA PH: 937-859-8777 | FX: 937-859-9188 www.hammelmann.com

Hammelmann manufactures extremely compact 3, 5 and 7 cylinder pumps for injection service with input capabilities up to 1500HP. The latest variation of this pump series is the "Zero Emission Pump" where the pumped fluid is hermetically sealed within the pump, preventing leakage to atmosphere during operation. Hammelmann pumps produce maximum performance from a minimal footprint which is the result of combining a compact integral speed reduction gear end with the concept of a vertical configuration. The vertical configuration channels oscillating forces directly downwards into the base structure. Unwanted lateral oscillations as produced by horizontal pumps do not occur.

HANSFORD SENSORS INC

2240 Hwy 292 Inman, SC 29349 USA PH: 281-324-0045

www.hansfordsensors.com/us

Hansford Sensors is a leading global manufacturer of industrial vibration monitoring sensors and accessories. We design, develop and manufacture a wide range of high-performance industrial accelerometers, vibration sensors, 4-20mA loop powered transmitters, vibration modules and switches, cable assemblies, industrial enclosures and ancillary equipment. These products can be used in a wide range of industries (from petrochemical, marine and cement to paper, wind and mining). Tough and built to last, our vibration sensors and systems deliver precision measurements time after time, under the most demanding conditions, helping customers improve the reliability, performance and profitability of their manufacturing and process systems.

HANWHA POWER SYSTEMS AMERICAS, INC

11700 Katyfreeway Houston, TX 77079 USA PH: (+1) 281-599-3377 www.hanwhapowersystems.com

Hanwha Power Systems (HPS) is expanding the business globally, pursuing worldleading technology and commitment to quality and envisioning a top-tier power & energy solution provider. Over the past 25 years, HPS has delivered more than 6,000 units of turbo compressors worldwide. Based in South Korea, we have overseas offices in China, Italy, Russia, UAE, Vietnam and USA. Our product offerings are mainly turbo compressors and power generation solution, including the supercritical CO2 power system.

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HASTIK-BAYMONT, INC.

220 Deerwood Glen Ct Deer Park TX 77536 USA PH: 713-661-1177 | FX: 713-661-3681 www.hastikbaymont.com

Manufacturer's Representative, distributor with full service repair center. Products sold include Lightnin & Philadelphia mixers (top & side entering), Pulsafeeder metering pumps, Dickow mag drive pumps and Marley (SPX Cooling Technologies) cooling towers.

HAYWARD TYLER

480 Roosevelt Highway Colchester, VT 05446 USA PH: 802-655-4444 www.haywardtyler.com

Hayward Tyler is a small business established in 1976 and located in Colchester, VT. We are a full service manufacturing company specializing in engineered pump and motor solutions for ASME and other specialist code applications worldwide. We offer a wide range of engineering and manufacturing capabilities to provide OEM and reverse engineered products.

HD HYUNDAI ELECTRIC

477, Bundang Suseo-ro Seongnam, AL 13591 South Korea PH: +823180066722 www.hd-hyundaielectric.com

HD Hyundai Electric manufactures a wide range of electrical equipment including induction and synchronous motors and generators up to 40,000 HP. Our stateof-the-art wide range of custom machines are provided, including those for the most severe applications. Whether your project requires motors for designed and built to North American standards, or IEC standard with ATEX/IECEx certification, HD Hyundai Electric has the experience and design team to fulfill your needs and has served as a committed partner to customers since 1977.

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HERMETIC PUMPS INC.

18847 Intercontinental Crossing Drive Houston, TX 77033 USA PH: 281-443-0905 | FX: 281-443-0960 www.hermetic-pumpen.com/en

Manufacturer of sealless pumps including canned motor, magnetic drive, and liquid ring vacuum. All canned motor pumps (CMP's) are designed with zero axial and radial thrust (ZART®) and meet or exceed API685 requirements. CMPs are available up to 1,000 HP, operating pressures up to 18,000 psig and temperatures from -200 to 850 degrees F. Available are single and multi-stage pumps in vertical, horizontal, and submersible arrangement. Our superior bearing technology makes our pumps the most reliable and cost effective pump in the market. Lowest cost of ownership.

HFW INDUSTRIES

196 Philadelphia Street Buffalo, NY 14207 USA PH: 716-875-3380 www.hfwindustries.com

HFW Industries manufactures and repairs turbomachinery and related equipment. Services include precision machining and grinding, thermal spray coatings, and hard face weld overlays.

HILCO

100 W. Fourth Street Elmira, NY 14901 USA PH: 607-733-7121 www.hilliardcorp.com

HILCO, a division of The Hilliard Corporation, has been engineering and manufacturing filtration systems for Turbo-Machinery Equipment since 1925. HILCO filtration cartridges have superior dirt holding capacity and have continually out performed its competitor's cartridges. Some of the company's systems include Oil Mist Eliminators with an efficiency rating of 99.97% at .03 micron, Lube Oil Conditioners, Duplex/Simplex Filters, Transfer Valves with zero leak pads, Process Equipment, Patented Dry Resin Ion Exchange, Varnish Prevention/Removal equipment as well as Engine Starting systems. HILCO welcomes your most challenging filtration needs.

HILLTOP TECHNOLOGY LABORATORY, INC.

6600 Chase Oaks Blvd., Suite 150 Plano, TX 75023 USA PH: 972-632-0551 www.hilltop21.com 2906

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We specializes in prototypes, custom CNC machining, short-run productions, and quick-turnaround.

HITACHI GLOBAL AIR POWER

1 Sullair Way Michigan City, IN 46360 USA PH: 800-785-5247 www.sullair.com

Sullair centrifugal compressors cover a broad range with options in both packaged and custom configurations. The Sullair centrifugal lineup features products delivering up to 118,000 cfm with discharge pressures up to 725 psi. Sullair is a Hitachi Global Air Power brand. Hitachi Global Air Power represents the combined strength of more than 150 years of Hitachi compressor experience around the world.

HOERBIGER COMPRESSION TECHNOLOGY

3350 Gateway Drive Pompano Beach, FL 33069 USA PH: 954-974-5700 | FX: 954-974-0964 www.hoerbiger.com

With more than 125 years of experience, HOERBIGER Compression Technology offers a comprehensive line of industry-leading, reciprocating compressor components, and a wide range of maintenance and repair services to help maximize compressor reliability and performance. HOERBIGER is also driving the green energy transition through innovation, know-how and our broad range of innovative products and services. In the U.S., HOERBIGER's headquarters are in Pompano Beach, Florida and La Porte, Texas, with additional locations in Texas, Louisiana, California, Wyoming, Illinois, and Kansas; ready to help with all your short and longer-term service needs.

HONEYWELL

2101 City West Blvd Houston, TX 77042 USA PH: 961-121-8325

Pioneering automation systems and measurement devices that improve operations. Honeywell Process Solutions is a pioneer in automation control, instrumentation and services for the oil and gas; refining; energy; pulp and paper; industrial power generation; chemicals and petrochemicals; biofuels; life sciences; and metals, minerals, and mining industries.

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HOOSIER PATTERN

906 N 10th St Decatur, IN 46733 USA PH: 260-724-9430 www.hoosierpattern.com

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HOUSTON DYNAMIC SERVICE, INC.

8150 Lawndale Houston, TX 77012 USA PH: 713-928-6200 | FX: 713-928-2903 www.houstondynamic.com

Houston Dynamic Service, Inc. is a privately held corporation and one of the largest independent facilities in the region. HDS has been providing service for over 47 years of the repair of rotating equipment. This includes all types and manufacturers of pumps, compressors, blowers, gearboxes, centrifuges and turbines. HDS can also assist with field service. In addition, HDS is the largest independent provider of seal strip for all types of applications. The HDS complex is located in the Houston Ship Channel area and provides services to petrochemical, refining, power generation, mining and offshore industries.

HOWDEN (A CHART INDUSTRIES COMPANY)

900 W Mount St Connersville, IN 47331 USA PH: (+1) 765-827-9200 www.howden.com/en-gb

Howden provides the mission critical solutions that our customers' vital processes depend on. We help our customers to increase their environmental and operational efficiencies and to decarbonize their operations. We have unrivalled experience in the provision of innovative rotating equipment for processes and applications in industries all around the world. Our specialists will consider your requirements including volume, pressure, gas type, size constraints, and many other variables to guide you to the right solution for your application. We are advancing a more sustainable future.



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HSI

6136 Frisco Sq Blvd Frisco, TX 75034 USA PH: 561-289-3758 www.hsi.com

HSI offers workforce training and development programs for industrial organizations. With an in-house development team, extensive media library, and state-of-the art technology including 3D animation, we provide a full menu of services: cutting edge eLearning, instructor-led training, training aids, workshops, job task analysis, employee progression, and train-the-trainer programs. HSI focuses on technical training for the equipment you use, including centrifugal pumps, positive displacement pumps, reciprocating positive displacement pumps and more. HSI also provides safety training, including qualified electric worker training to help you meet OSHA requirements.

HUNAN SUND TECHNOLOGICAL CORPORATION

No.9 Chayuan Road XiangTan 411101 Yuetang District, China PH: (+) 008673158550222 | FX: (+) 008673158550222 www.hnsund.com

Hunan SUND Industrial and Technological Co., Ltd. (also known as Hunan SUND Industrial Science & Technology Co., Ltd., and SUND) is an integrated solution supplier for rotating machinery bearings and transmission systems. SUND has been focusing on hydrodynamic fluid film sliding bearing design and manufacture since 1996. With decades of endeavor, SUND can provide highly reliable rotating machinery supporting systems and professional services for global market.

HYDRAULIC INSTITUTE

300 Interpace Parkway Parsipany, NJ 07054 USA PH: 973-267-9700 | FX: 973-267-9055 www.pumps.org

The Hydraulic Institute serves pump manufacturers, engineering consulting firms, and pump users worldwide by developing and delivering comprehensive industry standards; expanding knowledge by providing education and tools for the effective application, testing, installation, operation, maintenance, and performance optimization of pumps and pumping systems; and by serving as a forum for the exchange of industry information. HI established Pump Systems Matter as its educational annex in providing webinars and courses on the benefits to pump systems optimization and energy efficiency to improve bottom-line savings of end-user companies.

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HYDRO INC.

834 W Madison Street Chicago, IL 60607 USA PH: 312-738-3000 www.hydroinc.com

Founded in 1969, Hydro Inc. operates a global network of service centers that provide engineered repairs and upgrades focused on improving pump reliability and reducing overall life cycle costs. We pride ourselves in our unbiased viewpoint, comprehensive documentation, adherence to high quality standards, and commitment to customer service. Hydro's core business of refurbishment and field service is bolstered by a wide range of services designed to reduce the total cost of equipment ownership by addressing factors that impact availability and performance. Some examples include field testing and troubleshooting, on-demand and in-person skill development, condition monitoring, system optimization, and expedited parts supply.

HY-LOK USA

14211 Westfair West Dr. Houston, TX 77041 USA PH: 832-634-2000 | FX: 832-634-2099 www.hylokusa.com

HY-LOK USA, INC. IS THE AMERICAN MASTER DISTRIBUTOR OF HY-LOK CORPORATION, A GLOBAL INDUSTRY-LEADING PROVIDER OF VALVE AND FITTING SOLUTIONS. Hy-Lok supports a broad inventory of standard and nonstandard valves, fittings, semiconductor components and hydraulic presetting tools. Hy-Lok continues to push the envelope with new product development, carefully considering customer specifications like pressure, temperature, fluids, flow rate, environment and budget. We are always happy to answer inquiries for the availability or development of any specific valve or fitting.

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11200 Westheimer Dr Suite 625 Houston, TX 77042 USA PH: 281-940-5383 www.icareweb.com

I-care is a global leader in machine health. Our AI and data-driven solutions predict industrial failures months or even years before they occur. Thanks to I-care, machines around the world are safer, more productive, and more sustainable. Founded in 2004 in Belgium (HQ1), the company employs over 700 people and has offices in 12 countries (Asia-Pacific, EMEA, and Americas).

IDEAL ELECTRIC COMPANY

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Since 1903, IDEAL ELECTRIC COMPANY has become a globally recognized, leading supplier of high-power, specialty induction, synchronous, wound rotor and permanent magnet electric motors, generators, condensers, switchgear, power systems and controls up to 50 MVA. IDEAL machines are found in every application, are built to the highest specifications and to all standards and environments. Our Genuine IDEAL Re-manufacturing, Parts & Service, along with our heavy manufacturing and large testing capabilities, support our unyielding commitment to quality reflected in every component we supply and proven by thousands of machines operating globally. Protect your investment; always insist on GENUINE IDEAL.

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THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

Ingersoll Rand is a global leader in compressed air and gas systems specializing in design, manufacture, optimization and asset management. With a specialty in supplying complete system solutions, Ingersoll Rand offers a broad technology portfolio that includes centrifugal, screw and reciprocating compressors. Knowledgeable company experts conduct full site assessments to understand the customer's operating processes and design the most reliable and efficient solution for each application. Drawing on more than a century of industry experience, Ingersoll Rand has a legacy of helping customers be more competitive within their industries – including those in the petrochemical, air separation, LNG, power generation and general manufacturing sectors.

INNOMOTICS

100 Technology Drive Alpharetta, GA 30005 USA PH: 281-236-2333 www.siemens.com/us

Siemens Large Drives are one of the world's leading manufacturers of medium and high voltage motors and drives. These products form the basis for drive systems optimized to meet the demands for nearly any industry and application. Our portfolio is expanded to include complete solutions including electrification and automation. Digitalization solutions and our extensive global services complete the range.

INPRO/SEAL

4221 81st Avenue West Rock Island, IL 61201 USA PH: 309-756-5392 www.inpro-seal.com

Inpro/Seal®, the inventor of the Bearing Isolator, is an industry leader in bearing protection and process seals. Inpro/Seal products include the Bearing Isolator, providing permanent bearing protection on pumps, motors and other industrial applications, and the Sentinel® Floating Brush Seal, a drop-in replacement for carbon rings on process steam turbines that significantly extends maintenance intervals. Inpro/Seal technologies increase the reliability of rotating equipment and provide real cost savings by improving the mean time between repair. Inpro/Seal is part of Dover Precision Components, an integrated provider of performance-critical solutions for rotating and reciprocating machinery.

ISOMAG CORPORATION

11871 Dunlay Avenue Baton Rouge, LA 70809 USA PH: 225-752-0926 www.isomag.com 2046

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Isomag is the technological leader in industrial bearing seal protection. All Isomag bearing seals utilize precision lapped flat face sealing technology to provide a liquid tight seal. By preventing oil contamination, Isomag seals maximize bearing life and improve MTBF. Isomag seals are compact one-piece cartridge designs that are easy to install and will replace most lip seals and labyrinth seals. Seals are available for pump power frames, steam turbines, electric motors, gearboxes, and many other applications. Available in sizes to fit all shaft diameters from 3/4 inch to 13 inch.

ISTEC

Meer en Duin 8 Lisse 2163 HA Zuid-Holland, Netherlands PH: +31(0)252433400 www.istec.com

Istec is expert in the field of measuring, monitoring and protecting speed and vibration on industrial rotating equipment. We support customers with machine protection and monitoring solutions that suit an increasingly demanding environment; to maximize machine availability and safety while unlocking new machine insights and maintenance opportunities.Our dedicated team of consultants and engineers have deep industry expertise and a proven track record to deliver in the most challenging projects. By leveraging our in-house developed hardware solutions and partnering with reputable suppliers, we uphold an unwavering commitment to delivering the highest quality in our work.

ITT INDUSTRIAL PROCESS

240 Fall Street Seneca Falls, NY 13148 USA PH: 315-568-2811 www.gouldspumps.com

ITT Industrial Process (IP) is a dynamic business expanding on a global scale. Headquartered in Seneca Falls, New York, IP offers a portfolio of world-leading brands in industrial pumps, valves and monitoring and control equipment, offshore water treatment systems, and plant optimization and efficiency systems, as well as aftermarket services and parts.

ITW

30 Endicott Street Danvers, MA 01923 USA PH: 978-777-1100 www.itwperformancepolymers.com

ITW Performance Polymers offers the renowned Chockfast grouting and chocking compounds. The pumpable Chockfast epoxy grout foundation systems and chocking compounds enhance rotating equipment reliability and improve mean time before failure. Chockfast solutions ensure precise and permanent alignment

of all machinery and have an unmatched reputation for reliability with major gas pipelines, chemical, petrochemical and refining complexes, mining operations, and industrial construction operations worldwide.

JOHN CRANE

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31 Nash Road Manchester M17 1SS Greater Manchester, United Kingdom PH: +44-161-872-2484 www.johncrane.com

John Crane is a global leader in rotating equipment solutions, supplying engineered technologies and services to process industries. The company designs and manufactures a variety of products, including mechanical seals and systems, couplings, filtration systems and digital diagnostics technologies. John Crane customer service is accessed through a global network of more than 200 sales and service facilities in over 50 countries. Global reported revenue for fiscal year 2022 was \$1.2 billion USD. John Crane is part of Smiths Group, a global leader in applying advanced technologies for markets in threat and contraband detection, energy, communications and engineered components.

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KAYDON RING & SEAL, INC.

20 Industrial Dr. Hanover, PA 17331 USA PH: 717-633-7300 www.kaydonringandseal.com

Kaydon Ring & Seal manufactures main shaft seals for centrifugal and oil free screw compressors in hydrocarbon gas applications. The product line includes low leakage Mechanical Oil Seals, dry running Multi-Ring Circumferential seals, Dry Gas Seals, and Circumferential Barrier Seals. We are your lifecycle partner - optimizing initial seal selections and configurations, improving reliability of existing installations, and supporting service and repair needs over the life of your machinery installation.

KELM ENGINEERING, LLC

13711 Banks View Ct Houston, TX 77059 USA PH: 281-993-3717 www.kelmengineering.com

Kelm Engineering was formed in 1999. Its approach to solving equipment problems is to use a mixture of analytical modeling and field and/or shop testing

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500 Park Blvd Itasca, IL 60143 USA PH: 888-539-3623 www.keyence.com

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Kennametal® is a global supplier of solutions for wear, heat, and corrosion problems, a world-class manufacturer of components, and a service provider to a wide range of industries. Count on us for innovations that deliver productivity, reliability, and extended life in the harshest environments. We have a long history of helping our customers achieve success and a tradition of exceeding their expectations. By matching our advanced material solutions and technologies to your applications, we can help you solve your biggest wear problems, avoid costly downtime and catastrophic failures, and achieve significant savings.

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KENNAMETAL

to validate computer simulations and verify the effectiveness of solutions. Although the company is based in the Greater Houston area, Kelm's projects continue to be located around the nation and the globe.

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Kingsbury, in business since 1912, is the first and leading manufacturer of fluidfilm thrust and journal bearings. Our products are used in a wide variety of turbo machinery, including steam and gas turbines, compressors, gearboxes and pumps, with shaft sizes ranging from 25 to 1400 mm, and sliding velocities up to 130 m/sec. Please visit www.kingsbury.com for more details.

KISSLING AG

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Turbogears, whether for generators, fans, turbines or pumps, Kissling AG has been developing, designing and producing speed reducers and increasers for this range of applications since 1970. The gearbox is one of the core components of all these applications, which makes Kissling the heart of your system. With years of experience offering high quality, efficiency, flexibility and dependability, Kissling can meet and often exceed your gearing requirements. All products are characterized by the high-quality of materials and manufacturing.

KISTLER INSTRUMENT CORP

30280 Hudson Dr Novi, MI 48377 USA PH: 171-621-3571 www.kistler.com

Kistler is the global market leader for dynamic pressure, force, torque and acceleration measurement technology. Cutting-edge technologies provide the basis for Kistler's modular solutions. Customers in industry and scientific research benefit from Kistler's experience as a development partner, enabling them to optimize their products and processes so as to secure sustainable competitive edge. Unique sensor technology from this owner-managed Swiss corporation helps to shape future innovations in energy and infrastructure sector.

KNIGHTHAWK ENGINEERING, INC.

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17625 El Camino Real Suite 412 Houston, TX 77058 USA PH: 281-282-9200 | FX: 281-282-9333 www.knighthawk.com

KnightHawk Engineering is a technology-based specialty engineering company that performs consulting, field services, metallurgical and materials analyses, customized testing and product design and implementation worldwide. For over 30 years now, KnightHawk has been providing Engineering Solutions to solve some of the most challenging and difficult problems in industry. Our success lies in our multi-discipline integrated systems approach to problem solving. At KnightHawk, we start by defining the fundamental physics of the problem, then

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look at the Process, Mechanical, Controls Systems, Field Services and Material Interaction. KHE is available 24/7 to respond to your critical equipment failures, plant emergencies and testing needs.

KOBELCO COMPRESSORS AMERICA, INC.

1415 Louisiana St. Suite 4111 Houston, TX 77002 USA PH: 713-655-0015 | FX: 713-982-8450 www.kobelcocompressors.com

Kobelco Compressors America, Inc. began manufacturing compressors in 1915 and today is a global leader in compressor technology, engineering, and innovation. Kobelco designs, manufactures, and packages Screw (API619), Reciprocating (API618), and Centrifugal (API617) compressors for virtually any process gas application. Each system is custom engineered for optimum performance and outstanding return on investment. Through innovative technology and quality manufacturing, Kobelco offers solutions to boost productivity, reduce operating costs, and safeguard the environment. Visit us to speak with our compressor experts and learn more about our customengineered compression solutions.

KONGSBERG MARITIME INC.

145 James Drive East St Rose, LA 70087 USA PH: 504-712-2799 www.kongsberg.com/maritime/products/engines-engine-room-andautomation-systems/Machinery-Instrumentation/

KONGSBERG Engine Monitoring Systems consist of bearing monitoring components covering Bearing Wear, Water in Oil, Temperature of all bearings and additional measuring points such as Cylinder liner and exhaust gas temperature.

KRAFT WERKS ENGINEERING

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Kraft Werks Group, based in Medina, OH, is a manufacturer of equipment serving a broad range of markets including Oil & Gas, Petrochemical, and Power industries. Our various products include Gyrol brand fluid drives, TLT Ash Handling Systems, and Kraft Werks brand machinery. Kraft Werks is the North American representative for SETCON brand of electromechanical variable speed gearbox. The combination of Gyrol with SETCON offer a broad range of variable speed solutions for electric motor driven rotating equipment. Kraft Werks has over 100,000 sqft of manufacturing space that performs heavy fabrication, vertical &

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THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

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KRAL-USA, INC.

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KRAL is a leading manufacturer of screw pumps and flowmeters with innovative solutions to meet industry demands. A wide portfolio including API pumps and custom-engineered solutions help to assure a competitive edge for our customers within their area of business. We look far beyond our own product offerings to gain full understanding of the customer's requirements, applications and strategic plans. Professional customer service is affirmed with a certified QM system in compliance with EN ISO 9001:2015. After the purchase, a reliable and fast service team is there for you with product support.

KRISHNAVENI CARBON PRODUCTS PVT LTD

63/3 Athipalayam Road, Chinnavedampatti Post Coimbatore 641049 India PH: (+) 914227109966 www.krishcarbon.com

Our products cater to various sectors from Pump to Valves, Aeronautical to Railways, Industrial boilers to Steam turbines, white goods industry to printing solutions with a variable carbon grade to suit industry specific requirements. Our infrastructure boasts of fully automated PTS carbon plant installed with latest of CNC machineries and multiple impregnation plant (Resin/Metal). We are fully equipped with an in-house designed test rig for our design validation.

KRMEA

1st floor, Bethel Bldg, Yangjae-dong Seocho-ku, Seoul 06779 Seoul, South Korea PH: (+) 8225796271 | FX: (+) 8225796273 www.krmea.or.kr

KRMS is an international symposium for the sharing of relevant information of field experience skills, exchanges of developing technologies, development of skills to produce opportunities to cooperate with attending 'Rotating Machinery' field experts. Over 300 experts of the industry from all corners of the world are expected to converge for the Korea Rotating Machinery Symposium on the third Thursday and Friday of November every year. The event is renowned for boosting engineering abilities and skills in the field of the rotating machinery industry, making contributions to improve the equipment, operation and maintenance of rotating machinery.

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KSB SUPREMESERV

P.O. Box 969 Port Arthur, TX 77641 USA PH: 409-983-3201 | FX: 409-983-7837 www.standardalloys.com

Standard Alloys Inc., a KSB Company, is a full service solution provider offering replacement parts, repair and complete pump assemblies. Our factory and three repair centers are certified ISO-9001:2015 by DNV. Our services include custom-engineered solutions designed by our engineering staff. These designs are supported with our in-house pattern shop, foundry and machine shop. We have the ability to pour over 300 alloys as well as develop custom alloys to fit your application. Parts manufactured at our Port Arthur, Texas foundry are supported by our extensive machine shop, which allows us to offer quick deliveries.

KTS TURBOBILLET X

11, Persiaran KIP 1 Kepong, AK 52200 Kuala Lumpur, Malaysia PH: +601111393929 www.ktsturbobilletx.com

KTS Turbobillet X (KTS) is a specialty manufacturer of high-performance Machined-From-Solid (MFS) Compressor wheel, also known as Billet Impeller. KTS billets are distinguished by what is inside - technology, performance, selection, delivery and lowest risk. They are proven around the world and trusted by a discerning customer base consisting of over 600 turbo specialists, turbo manufacturers, tuners and race teams. What they, and we, have in common is a dedication to building a high-performance turbo knowing that our final user will be delighted. KTS offers the most compelling cost-benefit arguments for your success. For us, and for you, only the very best is good enough.

KULITE SEMICONDUCTOR PRODUCTS, INC.

One Willow Tree Road Leonia, NJ 7605 USA PH: 201-461-0900 www.kulite.com

Kulite is the World's recognized Leader in the science and engineering of piezo resistive sensors and holds more than 340 patents in this area. ISO 9001 Certified, Kulite manufactures all welded, high pressure, intrinsically safe, current output, voltage out, pressure transducers for resource exploration including submersible, downhole and towed array.

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L.A. TURBINE

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L.A. Turbine (LAT), a Chart Industries company, provides custom turboexpander design, manufacturing and testing of application-specific, highly engineered turboexpanders used in hydrocarbon processing, geothermal power generation, industrial power recovery and cryogenic applications. LAT's ARES AMB remains the industry's first turboexpander-compressor with a skid-mounted AMB controller and PLC, certified for hazardous area installation. LAT also provides aftermarket field service, equipment repair, redesign and spare parts for LAT and non-OEM turboexpander brands. LAT's FX-TURBO team provides diagnostic, maintenance and consultative support 24/7/365 onsite and remotely via +1-855-398-8726. LAT is headquartered in Valencia, CA.

LANCER SYSTEMS

2800 Milford Square Pike Quakertown, PA 18951 USA PH: 610-973-2600 | FX: 610-973-2601 www.lancer-systems.com

Lancer is an engineering and manufacturing firm trusted by customers in the defense, aerospace, natural gas and oil industries. Lancer deploys cutting edge plastic, fiber optic and CeraComp®, a patented ceramic matrix composite technology. When used in bad-actor-pump applications, our CeraComp® bearings, wear rings, and other petrochemical pump components provide significantly increase pump reliability/MTBF as compared to the same components produced from conventional metal, monolithic ceramic/SiC or polymer materials.

LEISTRITZ ADVANCED TECHNOLOGIES CORP.

165 Chestnut Street Allendale, NJ 7401 USA PH: 201-934-8262 | FX: 201-934-8266 www.leistritzcorp.com

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Leistritz manufactures Screw Pumps for the process, oil and gas, power generation and transportation industries. A complete line of two, three, five and multiphase screw pumps handle flow rates to 15,000 gpm and differential pressures to 2,100 psi. Leistritz has the expertise to deliver packages requiring

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LEO PUMP US

731 Bradfield Road Houston, TX 77060 USA PH: 703-949-0359 www.leopumpsus.com

LEO PUMP US, aka Acquaer Pompa Inc, located in Louisville, Kentucky, USA, is a wholly owned subsidiary set up by LEO PUMP. In 2016, we began operations in Minnesota. Our products cover transfer pump, utility pump, sump pump, sewage pump, deep well pump, and other series, specializing in domestic & commercial water supply, garden irrigation, and other areas. We are committed to developing safe, efficient, and environmentally friendly water pumps with tireless efforts to fulfill the mission to contribute to the water supply for North America.

LEWA AMERICA, INC.

132 Hopping Brook Rd Holliston, MA 01746 USA PH: 508-893-3218 www.lewa-inc.com

For six decades, we have set the technical standards for metering and process pumps, metering devices and complete systems for fluid metering. This is guaranteed by a solid technique, profound process and industry knowledge and the hermetically tight and absolute safe diaphragm technology. We design and manufacture efficient and customized solutions for virtually all metering, conveying, mixing, or odorizing tasks. With proximity to our customers – from engineering to technical advice or to commissioning on site – some 1,000 experts around the world enable a successful implementation of projects. High quality standards and a professional management ensure the best result.

LINCOLN ELECTRIC ADDITIVE SOLUTIONS

26250 Bluestone Blvd Euclid, OH 44132 USA PH: 216-383-4414 www.additive.lincolnelectric.com

3D metal printing factory for large turbomachinery and pump parts. Lincoln Electric Additive Solutions is a 24 hours-a-day/7 days-a-week manufacturing services provider of large 3D printed metal parts. It is vertically integrated, manufacturing its own power sources, wire feedstock, automation equipment and even the slicing and path planning software, SculptPrint[™] OS, ensuring delivery of high-quality parts. Additive Solutions delivers as-printed and finished parts from a variety of industrial metals, including steels, stainless steels, and nickel alloys. For more information about Lincoln Electric and its products and services, visit the Company's website at https://www.lincolnelectric.com

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LOCTITE

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Lone Star Blower & Compressor is a manufacturer, packager, & service company of centrifugal, geared, gearless, & multistage blowers & compressors, along with complete control systems. Our representatives are located throughout North/ South America & beyond. Industries served include Water/Wastewater, Power, Petro-Chemical, Oil/Gas, Food/Beverage, Mining, & other industries using low pressure compressed air or gas in pressure or vacuum applications. Products offered include gear driven single-stage blowers with variable inlet & discharge guide vanes, gearless (high-speed) blowers, & vertically split multistage blower technologies. Our Aftermarket Services takes care of the blowers & compressors you already have by offering complete support & services.

LUBE-POWER, INC

50146 Utica Drive Shelby Township, MI 48315 USA PH: 586-247-6500 | FX: 586-247-6510 www.lubepower.com

Established in 1979, Lube-Power is a world-class supplier of engineer-to-order lube, seal and control oil consoles for rotating equipment manufacturers. Lube-Power also provides exceptional aftermarket service and support for our equipment, or manufacturer's equipment.

LUDECA, INC.

1425 NW 88th Avenue Doral, FL 33172 USA 2741

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PH: 305-591-8935 | FX: 305-591-1537 www.ludeca.com

Predictive and Proactive Maintenance Solutions including laser shaft and pulley alignment, bore alignment, straightness and flatness measurement, monitoring of thermal growth, online condition monitoring, vibration analysis, balancing, induction heaters and ultrasound testing equipment as well as related software, rentals, services and training.

MACHINE SAVER INC.

9788 Clarewood Dr Suite 302 Houston, TX 77036 USA PH: 832-581-9908 www.Machinesaver.com

MACHINE SAVER'S IoT wireless and wired machine protection and condition monitoring solutions. We supply automated machine conditioning monitoring software. Our 3 axis and proximity probe sensors are intelligent wireless triaxle vibration and temperature sensors (VTBNet). Our low cost solution moves data and not people. Our unique products, software and service reduce total cost of ownership thru simplified installation, lowered cost of maintenance, carefree data maintenance and auto analysis. Our goal is to provide our customers a low cost total machine advanced warning and protection solution for pumps, motors, fans, blowers, gearboxes and compressors by providing unique products, software and exceptional services. www.machinesaver.com

MACHVIB SERVICES CORPORATION

8866 Gulf Fwy Ste 520 Houston, TX 77017 USA PH: 832-569-4426





MachVib Services Corporation is a vibration service company created to fill the needs for quality vibration monitoring services at a reasonable rate. Need an OEM replacement part but can't get it due to long lead times? Our partnership with various vendors allows us to provide access to replacement parts on demand. We are an independent vibration service company, therefore we can recommend the best possible solution for your vibration monitoring needs. At Machvib customer services is not a department, IT'S THE ENTIRE COMPANY!

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MAN ENERGY SOLUTIONS SE

1758 Twinwood Pkwy Brookshire, TX 77423 USA PH: 713-268-8032 | FX: 004533851030 www.man-es.com

MAN Energy Solutions enables its customers to achieve sustainable value creation in the transition towards a carbon neutral future. Leading the way in advanced engineering for more than 250 years, we provide a unique portfolio of technologies. In Houston, our Brookshire, Texas workshop includes a 100,000sqft service center with laser welding bay and in-house engineering support. Headquartered in Germany, MAN Energy Solutions employs some 14,000 people at over 120 sites globally. Our Omnicare capabilities offer repair solutions for third party rotating equipment including centrifugal and axial compressors, screw compressors, expanders, steam turbines, and more.

MASTER BUILDERS SOLUTIONS

889 Valley Park Drive Shakopee, MN 55379 USA PH: 1-800-243-6739 www.master-builders-solutions.com

Master Builders Solutions is a leading supplier of innovative chemistry systems and formulations for the construction industry. We offer products and solutions for industrial construction in the way of concrete repair, grouts, sealants and containment coatings. Our unique solutions provide structural integrity, safety, and environmental protection allowing for uninterrupted production. Whether the need is support and alignment of critical rotating equipment, concrete deterioration prevention, or containment assurance, Master Builders Solutions' industry respected people and products provide unique solutions.

MAUDLIN PRODUCTS

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Maudlin & Son Mfg offers full custom job shop capabilities including 5-axis water jet, metal stamping, wire EDM, laser cutting, and custom shims made to your specifications. Maudlin & Son is now manufacturing aftermarket Gas Turbine Repair components. These components consist of picture frame Wear Strips and Impingement Sleeve Zippers used for repairs on transition pieces. Maudlin Products offers a full product line of slotted shims, coil shim stock, stainless steel Tool Wrap, feeler gage, key stock, drill rod, and threaded rod. Mauldin's Cantilevered Spring line includes the most standards in the industry, as well as the largest inventory of on-hand material.

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10810 Train Ct Houston, TX 77041 USA PH: 832-547-2320 www.mayekawa.com/americas/mna

With over 120,000 compressors delivered, Mayekawa has paved its way into various industries from Chemical, Oil & Gas, Petrochemical, and Turbomachinery. For almost a century, Mayekawa has been dedicated to improving its delivery of solutions by building a worldwide network. Through this dedication and contribution to the customer and the market, Mayekawa's own "MYCOM" brand compressor has grown to become one of the most renowned brand of compressors in the world. MYCOM compressors have been serving Oil & Gas and Chemical markets for various applications, from standard packages to custom design-build packages that must meet rigorous quality and performance requirements.

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McNally-LLC is a small consulting company that provides mechanical and reliability engineering services specializing in turbo-machinery and ancillary equipment. We use the latest engineering software, instrumentation, data analyzers, and extensive know-how to help end-users select and purchase the most reliable turbo-machinery with the lowest life-cycle cost. We thrive in identifying the root causes that are creating problems and have a proven track record of providing value-added, cost-effective, and sustainable solutions developing short- and long-term strategies.

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Metrix Vibration, a leader in the condition monitoring & asset protection industry is the preferred supplier of vibration monitoring systems to many of the world's leading manufacturers and users of cooling towers, gas turbines, generators, pumps, motors, fans, reciprocating compressors, and other rotating machinery.

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With headquarters in Houston, Texas, Metrix operates in more than 40 countries via factory direct sales and with a strategic network of instrumentation partners. Metrix invented the technology of simple, affordable machinery protection with our vibration switch offerings, revolutionary 4-20mA vibration transmitters, robust high-temperature velocity sensors, and innovation impact transmitter technology. We look forward to working with our customers to provide the best solution to meet their requirements.

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Miba Industrial Bearings produce hydrodynamic bearings and labyrinth seals for use in the Petrochemical, Refining and Power Generation markets. Our products are used in a wide range of high-performance applications (centrifugal turbines, compressors, motors and industrial pumps). Our technology enables those applications to run more efficient, powerful and environmentally friendly. Regardless of where our customers are located, they can rely on the performance of Miba Bearings. We accompany our customers around the world, supporting them with our products and services. Our network spanning four continents allows us to respond quickly and flexibly to the various needs of our customers.

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for our technology, quality, efficiency, and reliability. Mitsubishi Heavy Industries Compressor Corporation is a leading manufacturer of API compressors and mechanical drive steam turbines. Our products are widely used in the oil & gas and petrochemical markets and range in size from 300mm – 2000mm in impeller diameter. Our US based 180,000 ft² state-of-the-art packing and service center, Pearland Works, is conveniently located in the Gulf Coast, just outside of Houston, TX. Backed by local sales, engineering, and operations experts, to support Mitsubishi and other OEM turbomachinery.

MOBIUS INSTITUTE NORTH AMERICA

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Mobius Institute provides internationally recognized Vibration Analysis, Ultrasound Analysis, Infrared Thermography, and Asset Reliability training and accredited certification to condition monitoring, maintenance, asset reliability practitioners, and business leaders with 56,000+ students from 160+ countries being trained to date. Each training includes animations and interactive simulations to ensure you enjoy the learning process. Mobius Institute Board of Certification is independently audited and accredited to ISO/IEC 17024.

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Nikkiso Clean Energy & Industrial Gases Group is a leading provider of cryogenic pumps, heat exchangers, process systems, turboexpanders, ORC energy recovery system, services, and solutions for the LNG, Hydrogen, Natural gas, waste heat and industrial gases industry. Nikkiso Expander Application Technology (NEAT) offers turboexpander-compressor, Turboexpander-generator for hydrocarbon gas processing, petrochemical and hydrogen industries and specializes in aftermarket and service for Turboexpander products. Through 20 global service facilities, we service industrial gas and air separation industries, clean energy, alternative fuels and the marine industry. We are proud to be a participant in the Turbo Symposium Houston 2023.

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OTC Industrial Technologies focuses on critical products ensuring customers' peak performance. Our Rental Solutions offers North America's largest fleet of Rental Centrifugal Oil-Free air compressors and provides Oil-Free Rental Rotaries, Boosters, and Blowers. If you have an emergency or long-term rental requirement, we have the equipment. OTC also offers DIRECTAIR®, the industry-leading compressed air solution. DIRECTAIR® provides a guaranteed compressed air system around the clock, allowing you to focus on production needs. DIRECTAIR® designs, builds, and operates all necessary equipment for the system, resulting in zero capital outlay to you. DIRECTAIR® truly is the 4th utility for your manufacturing facility.

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PetroPages Industrial Marketing is a full service marketing company specialized in the process and power industries. Our services include: Automated marketing, 3D animation, web design, search engine optimization, interactive presentations,

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POWERGEN International® is the largest networking and business hub for electricity generators and solution providers engaged in power generation. Power producers, utilities, EPCs, consultants, OEMs, and large-scale energy users gather at POWERGEN International® to discover new solutions as large centralized power generation business models evolve into cleaner and more sustainable energy sources. POWERGEN creates a progressive environment for our core audience looking to evolve while attracting new energy professionals embracing the clean movement towards Destination 2050.

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The mission of Precision Machinery Contractors (Precision) is to provide best in class service for the life cycle of our client's rotating equipment with excellence in safety, quality, and efficiency. This is achieved by employing an elite team and providing them with premiere tooling, clear, practical, and up to date safety and guality systems, standard operating procedures, and continuous training." Our core team has over 150 years combined experience in the rotating equipment sector with key knowledge of: Pumps, Centrifuges, Blowers, Fans, Turbines, Gearboxes, Extruders, and Compressors (reciprocating and centrifugal). Our offices are located at 4680 S Sam Houston Pkwy E, Houston, TX 77048.

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PRLC

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Internationally, PROGNOST Systems is the No.1 partner for companies who strive to ensure safe, reliable, and economic operation of their rotating equipment. PROGNOST Systems offers machinery protection and condition monitoring systems as well as diagnostic services based on over 25 years of experience in recording, analyzing and interpreting continuous high-resolution data for rotating equipment.

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Pump Products and Services is a leading authorized distributor and authorized service provider of Peerless Pump Company in the Gulf area of Texas. We specialize in providing our customers with new pumps, spare parts, and a wide range of rotating equipment services including field services. Our team of highly skilled technicians and engineers are committed to delivering top-quality products and services to meet our clients' unique needs. At Pump Products and Services, we pride ourselves on providing exceptional customer service and support.

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Celebrating its 25th anniversary in 2018, Pumps & Systems continues to provide the most comprehensive coverage of the pump industry worldwide. Our monthly magazine and digital edition connect 46,000 qualified, BPA-audited subscribers with technical solutions and informative case studies. The total monthly P&S audience has grown to more than 180,000, thanks to our active website and popular enewsletters. Readers—regardless of the platform they choose—return

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Headquartered in Houston, Texas USA and owned by DXP Enterprises, PumpWorks manufacturer's current edition API 610/ISO 13709 centrifugal as well as a full line of ANSI pumps tailored specifically to the pumping needs of petroleum refinery, gas processing, petrochemical, offshore platform, hydrocarbon/crude oil pipeline, chemical, power and industrial markets. PumpWorks 610 offers a full range of API 610 configurations including OH2, OH3, OH4, VS1, VS6, BB1, BB2, BB3 & BB5 pumps and Upgrade Kits. Our ANSI line includes the heavy-duty ANSI line, Low Flow, High Temp, Recessed Impeller, In-line & Self-Priming & Sump Pump models.

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PumpWorks Industrial, also located in Houston, Texas USA, manufacturers a wide variety of centrifugal process pumps exceeding ANSI B73.1 and other standards for the Chemical and Petrochemical, Pulp and Paper, Food and Beverage, Oil and Gas, Mining, Power Generation, Waste Treatment and General Industrial industries. PumpWorks Industrial provides a full range of ANSI Standard, Low-Flow, Self-Priming and Vertical Inline pumps with superior design features compared to traditional ANSI manufacturers. All components are sourced, manufactured, and tested in the USA with strategic inventories located throughout the Northern Hemisphere, providing the very best quality, price and delivery.

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PVTVM Inc. was founded in 1996 in Houston Texas USA. PVTVM is a leading manufacturer of rotating and reciprocating machine condition monitoring and machine protection hardware, software and field services. Products manufactured include machine protection monitors, vibration switches, vibration transmitters (4-20mA or MODBUS). PVTVM also manufactures a complete

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line of proximity probes, accelerometers and piezo-velocity sensors. Software includes real time vibration and process information, trending, machine condition diagnostics, dynamic data, transient data capture. Services include vibration training, installation, start-up and commissioning assistance. PVTVM has complete machine monitoring solutions for critical steam/gas turbines, compressors as well as small pumps, motors and fans.

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We are located in Coimbatore, India and we are also an ISO 9001:2008 certified manufacturing company. We export ferrous and non-ferrous machined units. They play a vital role in making various applications in automobiles, textiles, pumps, valves, agricultural equipment, aerospace machineries, food processing equipment and general engineering parts.

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Qiubao Valve Co.,Ltd.is located in Wenzhou, one of China's most economically dynamic cities. Qiubao valve boasts more than 30 years of continuous innovation and development. It is a leading supplier of valve forging manufactures in the world. Adhering to the concept of innovation, technology, and practicality, three main bases (Qingtian plant, Tangtou plant and headquarters) have been built with a complete production chain, covering forging, heat treatment, machining, surface treatment and other production processes. The main products include forged balls, bodies, covers and other components, and gradually extend to other forging industries with the annual output value of 80 million dollar in 2018.

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RAM ALLOYS LLC

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12233 FM 529 Houston, TX 77041 USA PH: 713-466-1890 www.ramalloys.com

Ram Alloys is an ISO 9001:2015 certified stocking metals service center focusing on the rotating equipment and flow control markets (OEM and repair and maintenance). 100+ years of industry experience allows Ram Alloys to tactically build its stainless and nickel alloy round bar and PSQ inventory to effectively serve its target markets. Ram Alloys further leverages its expertise to offer customers several value-added services: (1) Centerless Grinding; (2) Boring, Honing, Trepanning; (3) Heat Treating – long lengths both horizontally and vertically; (4) Saw Cutting – custom lengths, production cuts, or blocks; (5) Inventory Management – JIT and Kanban; and (6) 24/7 Emergency Service.

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SEPCO is a global sealing solutions provider headquartered in Alabama, USA. With a proud history of providing quality sealing components, SEPCO manufactures pump and valve packing, mechanical seals, gasket materials, highperformance plastics, air seals, and bearing isolators.

SEALMATIC INDIA LTD.

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Sealmatic designs and manufactures mechanical seals and associated products mainly for the oil & gas, refinery, petrochemical, chemical, pharmaceutical, fertilizer, power, mining, pulp & paper, aerospace, marine and many more industrial applications. It provides the most complete selection of engineered mechanical seals and sealing support systems. Sealmatic products are globally recognized as a trusted brand in the process industry.

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2 rue des Champs Saint Marcel 27950 Eure, France PH: (+33) 232643323 www.skf.com/group/products/magnetic-bearings-systems

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SLM SOLUTIONS

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20 Burlington Mall Rd, Ste 450 Burlington, MA 01803 USA PH: 781-328-4310 www.softinway.com

SoftInWay, Inc. is a global R&D engineering company specializing in the development of efficient turbomachinery components and systems. Its integrated and automated software platform AxSTREAM® covers all steps of turbomachinery design, redesign, analysis, and optimization (including complete 3D design, thermodynamic cycles, rotor dynamics, and secondary flow and cooling system simulation). SoftInWay also offers several engineering services and educational courses, available both online and in a classroom-style setting. SoftInWay supports more than 500 companies worldwide and works closely with OEMs, service providers, utility companies, universities, research laboratories, and government organizations.

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34 N Maple St., Ste 7 Florence, MA 01062 USA PH: 413-267-0590 | FX: 413-567-0592 www.sohreturbo.com

Sohre makes shaft grounding brushes to control stray electrical currents in electrical and nonelectrical turbomachinery (compressors, Sohre brushes are useful for electrostatic, electromagnetic, or other electrically induced stray currents. The current rating of Sohre brushes ranges from 1 to 100 DC amperes per year of bristle life. Brushes utilize special alloy bristles and are run directly on shaft, either dry or in oil. Cleaning or maintenance generally is not necessary.

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turbines and compressors, with approximately 16,000 units with more than 3 billion operating hours in more than 100 countries. Products from Solar play an important role in the development of oil, natural gas and power generation projects around the world. Solar's products include gas turbine engines, gas compressors, and gas turbine-powered compressor sets, mechanical-drive packages and generator sets.

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SOUTHERN STATES MILLWRIGHTS

18525 W Lake Houston Pkwy Suite 103 Humble, TX 77346 USA PH: 281-460-1886 www.southernstatesmillwrights.org

The Southern States Millwrights Regional Council was established over a decade ago to address the growing need for a safe, skilled, productive rotating equipment workforce in the Southern United States. The SSMRC is nearly 6000 members strong and we are constantly training tomorrow's workforce to keep up with demand and recruiting the best in the industry to service our partners.

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15014 Lee Rd. Humble, TX 77396 USA PH: 281-441-2000

Southwest Impregion is a top applicator in specialized coating technologies. We provide high-performance coatings to a range of industries including Power Generation and Oil & Gas. From high-temperature oxidation to mechanical wear and corrosion, gas and steam turbine equipment is susceptible to damage that can have severe consequences for the power grid. Our aluminide coatings are formulated to protect turbine blades and other rotating and stationary components from corrosion and pitting. Our HVOF and plasma sprayed coatings offer superior wear, corrosion, and thermal barrier protection. We're committed to finding the best solutions for your applications with our in-house Metallurgical Laboratory and on-staff Chemist.

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Southwest Research Institute® (SwRI®) is an independent, nonprofit, applied research and development organization, founded in 1947 and headquartered in San Antonio, Texas, with nearly 3,000 employees and an annual research volume of \$798 million. SwRI provides quick-response field consultation and design services to solve vibration, pulsation, and performance problems associated with plant machinery and piping systems. SwRI is also recognized for its turbomachinery development services from concept design and rig testing to full-scale prototype fabrication and evaluation.

SPARKCOGNITION

12708 Riata Vista Cir Austin, TX 78727 USA PH: 936-707-2114

SparkCognition delivers enterprise scale AI solutions that enable organizations to optimize processes, predict future outcomes, and prevent cyberattacks. We augment human intelligence, driving digital transformation and bottom-line results. With deep expertise across critical industries, we're working together with our clients to help solve problems, big and small, that matter most to them.

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Design and supply of Air Cooled Heat Exchangers (ACHE). Lube oil cooling, Watercooling, Seal Air cooling, Purge Air cooling. For use in Gas Turbines, Compressors and Pumps. Exported globally from the UK and manufactured to the highest international standards.

SPECTRA QUEST, INC

8227 Hermitage Road Richmond, VA 23228 USA PH: 804-261-3300 | FX: 804-261-3303 www.spectraquest.com

Spectra Quest is the leading developer and manufacturer of turnkey systems

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for research, education, and training in machine condition monitoring and fault diagnosis, and engineering educational laboratory devices. A turnkey system includes a machinery fault simulator, instrumentation, software, curriculum, and laboratory exercise books. Our products are sold in over fifty countries and our customer base spans Fortune 500 companies, R&D establishments, and top-rated academic institutions.

SPICO CORPORATION

909-43, Seobu-ro, Jillye-Myeon Gimhae-Si 50876 Gyeongnam, South Korea PH: +82-55-342-9222 | FX: +82-55-342-9228 www.spico.co.kr

SPICO Corporation manufactures heat exchanger, pressure vessel, lube oil system used in turbines, compressors and pump etc.

SSS CLUTCH COMPANY, INC.

610 West Basin Road New Castle, DE 19720 USA PH: 302-322-8080 www.sssclutch.com

SSS Clutches- Propulsion systems for 50+ navies; 650+ peak-load generators for synchronous condensing, single-shaft combined-cycle plants, steam turbines to 400 MW in CHP/Cogen, (CAES) plants, 500+ diesel engine driven rotating UPS generators, dual driven pumps, dual driven compressors, including gas pipeline, dual driven process and boiler fans, energy recovery applications, thousands of turning gear and gas turbine starter drives.

STEIN SEAL INDUSTRIAL DIVISION

375 East Church Road Telford, PA 18969 USA PH: 215-256-0201 | FX: 215-703-9864 www.steinsealind.com

Stein Seal Industrial Division is a world-class manufacturer of mechanical sealing systems. With over sixty years of mechanical seal Development, Engineering, Manufacturing, and repair service history. With strategic repair and development centers, Stein is uniquely positioned to service the needs of the turbine, compressor, petrochemical and heavy industries market segments.

STORK H&E TURBO BLADING

334 Comfort Rd Ithaca, NY 14850 USA PH: 607-277-4968 | FX: 607-277-1193 www.he-machinery.com

Stork is the leading manufacturer of steam turbine blades, buckets, nozzles;

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gas turbine compressor or axial compressor blades, stator vanes, inlet guide vanes; generator fan blades; FD & ID blower blades; Fan blades and vanes for multiple applications & industries. Stork is the largest and oldest independent manufacturer of these spares in the world. All OEM model turbines are supported, including obsolete nameplates. Stork delivers world-class quality, pricing, and delivery to meet and exceed your requirements. Stork also offers reversal inspection services for your components from small parts, to the largest turbine casings, using GOM Blue Light 3D scanning equipment.

STRUCTURAL TECHNOLOGIES

1003 Clay Court Deer Park, TX 77536 USA PH: 281-241-5809 www.structuraltechnologies.com

STRUCTURAL TECHNOLOGIES is firmly committed to its mission of making structures stronger and last longer. We develop and integrate products, engineering support, repair and maintenance services to provide value-added solutions to owners, engineers and contractors. STRUCTURAL TECHNOLOGIES provides state-of-the-art proprietary products and engineering support, and delivers repair & maintenance services through our construction licensees

SUMITOMO HEAVY INDUSTRIES GEARBOX CO., LTD.

3-33, 2-Chome, Nakanoshima, Kita-ku Osaka-shi 530-0005 Osaka, Japan PH: (+) 81-50-2036-2629 www.shigearbox.com

Sumitomo Heavy Industries Gearbox Co., Ltd., formally called SEISA Gear Ltd., has more than 100 years of manufacturing experience in highly customized gear drives, high-speed acceleration and reduction gears for compressors and turbine generators, mill drives for cement and coal, and gear couplings. As a result, those geared products are trusted and used in various fields as key components.

SUNDYNE

14845 West 64th Ave Arvada, CO 80007 USA PH: 303-425-0800 www.sundyne.com

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Sundyne manufactures highly reliable engineered process Pumps and Compressors. The Sundyne product line consists of Ansimag Magnetic Drive Non-Metallic Pumps, HMD/Kontro API-610/685 Pumps, Sundyne API-610 Pumps, Sundyne API-617 Process Compressors, Marelli API-610 Pumps, and Sunflo High Pressure Pumps. With facilities and expert Channel Partners around the world, Sundyne products are an integral part of the process industries that fuel life's basic needs.

SYTEK ELECTRIC

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1233 West 34th Street Houston, TX 77018 USA PH: 713-862-8813 www.sytekelectric.com

Electric Motor repair services. Our repair facility consists of over 20,000 sq. feet, (5) bridge cranes totaling 70 tons of lifting capability, as well as jib cranes allowing us to handle almost any size motor. We offer services 24/7 as well as field service. We are dedicated to keeping our customers up and running and strive to get each job done right and deliver on time. Our quality craftsmanship and customer service is the foundation of our company.

T.F. HUDGINS, AN ALLIED RELIABILITY BRAND

10344 Sam Houston Park Dr. Suite 110 Houston, TX 77064 USA PH: 713-682-3651 | FX: 281-807-3244 www.alliedreliability.com/engineered-products

T.F. Hudgins, an Allied Reliability brand, specializes in protecting assets and driving reliability improvements for reciprocating and rotating machinery using proven solutions and in-depth application expertise. We leverage internal engineering, manufacturing, and project management capabilities, as well as the resources of leading manufacturing partners to yield meaningful improvements in productivity, longevity, efficiency, cost-effectiveness, safety, and environmental compliance.

TECHNOGENIA, INC.

708 Old Montgomery Road Conroe, TX 77301 USA PH: 936-441-4770 www.technogeniausa.com

Lasercarb® by Technogenia, the innovators of hardfacing process technology, are strategically applying Technolase® powder with Spherotene®, a sphericcal cast tungsten carbide, to extend the wear life of new and worn components against abrasion, erosion and corrosion.

TECHSTAR

802 W 13th St Deer Park, TX 77536 USA PH: 281-542-0205 www.techstaris.com

With over 20 years in process controls and industrial automation, TechStar has everything needed to help get your measurement and process challenges solved and running in their optimal performance and output. Experience, innovative solutions, training and service are the foundation of what TechStar offers to customers. Backed by our world class manufacturing strategic partners, our team is well equipped to see you through every step of the toughest applications and challenges.

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TEIKOKU USA

959 Mearns Road Warminster, PA 18974 USA PH: 267-485-4043 www.teikokupumps.com

Sealless and Leakproof Canned Motor Pumps, as designed and manufactured by the global Teikoku Group, provide customers looking for high levels of mechanical reliability and fluid containment the ultimate in centrifugal pumps for the transfer of hazardous, expensive and environmentally sensitive fluids. Teikoku and Chempump products are loaded with features that help users reduce installation, maintenance and space-related costs.

TERN TECHNOLOGIES, INC.

200 W 34th Ave, #1017 Anchorage, AK 99503 USA PH: 907-522-2411 | FX: 907-522-2412 www.terntech.com

Tern Technologies, Inc. is a full service rotating equipment consulting group offering the best in optical and laser alignment, precision measurement, vibration analysis, mechanical engineering and instrumentation support. Their personnel have extensive world-wide experience with a wide variety of rotating equipment. Industries serviced include power generation, petrochemical, pipeline, pulp and paper, mining and marine propulsion. Services include shaft alignment, thermal growth studies, internal alignment, routine periodic vibration surveys, field balancing, vibration analysis and permanent vibration monitoring system engineering, installation and maintenance. Rotating equipment engineers provide field service support for construction and start-up, failure analysis and design audit.

TEXAS BEARING SERVICES

4333 Dixie Farm Road Pearland, TX 77581 USA www.texasbearingservices.com

Texas Bearing Services provides new bearings, seals and bearing repair services to industry leading OEMS, distributors and end users all over the world.

TEXAS COMPRESSION, LLC

2214 West 43rd Street Suite: B Houston, TX 77018 USA PH: 713-290-0202 | FX: 713-290-0303 www.TexasCompression.com 2507

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Texas Compression, LLC is a Houston-based mechanical and industrial services contractor offering a complete range of professional and technical services. Our mission is to safely deliver the highest level of service and premium products maximizing the uptime of critical process equipment. With more than 30 years' experience working in the energy industry, we guarantee we will safely complete your project and exceed your expectations. Texas Compression specializes in situations where safety, quality and reliability are a priority.

TEXEL-SEIKOW U.S.A., INC.

4404 W 12th St Houston, TX 77055 USA PH: 281-928-7041 www.texelseikow.com

TEXEL-SEIKOW U.S.A. is US subsidiary of Seikow Chemical Engineering & Machinery who is global manufacturer of blowers, pumps, and environmental equipment by utilizing core corrosion resistance technology. Engineering and product lines allows to offer the optimal solution for practically any corrosive gas or liquid handling application. We design and construct our products based on advanced polymeric materials that possess excellent corrosion resistant and durable qualities to service any corrosive chemical application for a wide range of industries. The 3 primary groups of product lines we develop are Chemical Resistant Pumps, FRP and Polypropylene Centrifugal Fans/Blowers, and FRP Wet Scrubbers.

THOMAS PUMP & MACHINERY

120 Industrial Drive Slidell, LA 70460 USA PH: 985-649-3000 www.ThomasPump.Com

Thomas Pump manufactures the T-GTO Pitot Tube pump in the USA. The T-GTO is a high-pressure centrifugal pump designed for a pressure range of 600-1500 psi and flow rates up to 400 GPM. In addition, we engineer, design, and manufacture custom pump systems that are tailored to your plant's demand. Our commitment to service is highlighted by our 24/7 XCHANGE program, sending out replacement pumps to customers within 24 hours of a request.

THORDON BEARINGS INC.

3225 Mainway Burlington ON L7M 1A6 Ontario, Canada PH: 905-335-1440 | FX: 905-335-4033 www.ThordonBearings.com

Thordon Bearings designs and manufactures a complete range of self-lubricating polymer bearings for various operating environments. Thordon has several

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grades that in virtually all applications and can replace greased bronze bearings in all applications where they are currently installed such as vertical pumps, aerators, flocculators, screens, butterfly valves or pivot point applications. Thordon polymers are easy to machine and tube stock can be kept on the shelf for quick repair. Thordon's strong and recognizable global brand is known for high quality and superior performance.

TOROUEMETERS LIMITED

West Haddon Road Ravensthorpe NN6 8ET Northamptonshire, United Kingdom PH: (+) 4401604770232 | FX: (+) 4401604770778 www.torquemeters.com

Measuring steady state torgue and torsional vibration in a single product, their Torquetronic(TM) Continuous Duty Torque measurement system is the recognized industry standard for accurate power measurement of mechanically driven turbo machinery in the Oil, Gas and Petrochemical industries Torquemeters' 800 family of display electronics provides a flexible platform to show real time continuous torgue and torsional vibration analysis, including FFT capability. SIL2 capability now available for real time accurate torque/power measurement for process control.

TOSHIBA INTERNATIONAL CORPORATION

13131 West Little York Road Houston, TX 77041 USA PH: 800-231-1412 www.toshiba.com/tic

Toshiba International Corporation offers a full range of low and medium voltage motors, adjustable speed drives, motor controls, and power apparatus & components. We are anchored by a totally integrated manufacturing process consisting of: research and development, design, engineering, production and manufacturing, and aftermarket service and support. With the capability to test products together as a system before sending out into the field, TIC ensures the highest level of quality, performance, and reliability.

TOTAL INDUSTRIAL SERVICES SPECIALTIES, INC.

12800 Fugua, St Houston, TX 77034 USA PH: 281-922-7555 | FX: 281-922-7555 www.tissinc.com

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Total Industrial Services Specialties, Inc. (TISS) is the one stop shop for Millwright Services, Field Machining, Bolt Torqueing, Machine Shop Services and Equipment Repair. We specialize in the installation, maintenance and repair of Turbines, Pumps, Compressors (Reciprocating and Centrifugal), Extruders, Gear

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TRICO CORPORATION

1235 Hickory Street Pewaukee, WI 53072 USA PH: 262-509-0416 | FX: 262-691-2576 www.tricocorp.com

Trico Corporation provides lubrication management solutions with a focus on industrial equipment performance and reliability. We have accomplished this by combining high-performance lubrication products with our oil analysis services and in-plant services, as well as lubrication management training. Our core products include storage and handling, contamination control, oil sampling, constant level lubrication, desiccant breathers, oil level sensor, grease lubrication, filtration, central lubrication, and visual inspection products.

TRINITY COATINGS LLC

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Quality Robotically Applied Thermal-Sprayed Coating Solutions for the Power Generation, Oil & Gas, Petrochemical Industries. Turbomachinery & Rotating Equipment, HVOF, Plasma Spray, TSA/TSZ, TBC, Chrome Tungsten Carbides, Abradable Coatings, Industrial Painting, Dry Film Lubricants, Aluminum Slurry Coatings. We also offer Turnkey Services. Abrasive Blast, Shot Peen, Vacuum Heat Treat, Manufacturing, Machining, Grinding Services.

TRIVENI TURBINES

12-A, Phase 1 Bengaluru KS 560058 Karnataka, India PH: (+) 08022164000 www.triveniturbines.com

Triveni Turbines is one of the largest manufacturers of industrial steam turbines of up to 100 MWe and has emerged as one of the market leaders in the sub-30 MWe range. With more than 1 billion operating hours of turbine fleet, it has installed over 6,000 steam turbines (generating more than 16 GW power generation capacities) in 20 plus industries. We are present in over 75 countries around the world, and the steam turbines are manufactured at our world-class facilities located in Bengaluru, India.

TSS TURBINE SPECIALTY SERVICES

309 CR 2242 Cleveland, TX 77327 USA PH: 281-562-7655 www.Turbinespecialty.com

Steam Turbine Repair and parts, Pump repair and Service, Gear Box Repair and Service, Babbitt Bearing manufacture and repairs, Fab shop- Skids, Tanks, Gas and Oil Manufacture, Parts- All Steam Turbines, New Rotors, Machining - Line Bore, Fly Cutting, incerts, Balancing- of all types of Rotors, Sand Blasting -Industrial Painting.

TURBINE PUMP AND COMPRESSOR

8040 Leesa Lane Pasadena, TX 77507 USA PH: 281-991-1997 | FX: 281-991-1564 www.T-P-C.net

TPC is specialized in shop repair, field service repair and sales of parts for steam turbines, pumps, blowers, gearboxes, reciprocating and centrifugal compressors. We package reciprocating compressors and pump units. TPC performs complete compressor overhauls in the field or in the shop. Compressors can be reengineered for process changes or to maximize capacities. FEA studies are performed to maximize new designs of piston and rod assemblies. Manufacture new cylinder liners and install complete in cylinders.

TURBOMACHINERY INTERNATIONAL

485F US Highway 1S Ste 210 Iselin, NJ 08830 USA PH: 732-346-3027 www.turbomachinerymag.com

Turbomachinery International[®] covers the latest industry news in the energy and industrial markets, including engineering breakthroughs in gas and steam turbines, compressors, expanders, pumps, combined cycles, instrumentation and control and all associated equipment and services in land, air and marine-based applications. Available in PRINT and ONLINE.

TURBOMACHINERY LAB EDUCATION STATION

3254 TAMU College Station, TX 77845-3254 USA PH: 979-845-7417 turbolab.tamu.edu/short-courses-2/

The Turbomachinery Laboratory makes a vital impact on the turbomachinery, pump and related industries through three pathways: research, education, and workforce development. As part of its workforce development arm, the Turbo Lab offers extended short courses throughout the year led by industry

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experts and academics. Courses range from three-to-five days and offer working professionals valuable education opportunities in an interactive environment. Continuing Education Units (CEU) are awarded upon course completion

TURBOMACHINERY LABORATORY

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Texas A&M University 3254 College Station, TX 77843-3254 USA PH: 979-845-7417 | FX: 979-845-1835 turbolab.tamu.edu

The Turbomachinery Laboratory, part of The Texas A&M System, conducts theoretical and applied research intro reliability and performance of turbomachinery. The Turbo Lab impacts the industry through three pathways: 1) Research: The Turbomachinery Research Consortium was formed in 1983 to find answers to important questions of reliability and performance of turbomachinery for industrial companies who supply annual research grants. 2) Education: The Turbo Lab produces engineers ready to work by offering undergraduate and graduate engineering education. 3) Professional Workforce Development: The Turbo Lab organizes the annual Turbomachinery & Pump Symposia in Houston and the biennial Asia Turbomachinery & Pump Symposium in Kuala Lumpur, Malaysia.

TURBOTIDES, INC.

21 Pinneo Hill Rd. Hanover, NH 03755 USA PH: 480-313-7277 www.turbotides.com

TurboTides is the newest most modern and powerful Design and Analysis software system available for all disciplines of Turbomachinery - Pumps, Compressors, Fans and Turbines. Emphasis is placed on modern and seamless workflow for more rapid and accurate design iterations. TurboTides is also premiering an industry first AI Driven Optimization for turbomachinery. For the first time, users will be able to design compressors, fans, pumps, and turbines with a seamlessly integrated design workflow combined with a powerful optimizer to achieve fast turnaround times for their design iterations.

TYCON ALLOY INDUSTRIES (HONG KONG) CO., LTD.

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Lvl 13 Tower 2, Kowloon Commerce Centre, 51 Kwai Chung Rd Kwai Chung 518114 Hong Kong, China PH: (+) 8328656718 www.tyconalloy.com

Founded in 1995, Tycon Alloy Industries is specialized in the provision of stainless steel casting engineering solution and related technical and value-added services. Tycon has built a strong reputation in providing high-value precision and sand casting engineering solutions. Since its inception, Tycon has successfully logged

over 10,000 different products from several 100g to more than 1000kg a piece. Tycon takes pride in being able to supply top quality products to our market leader customers. Tycon's casting standards are in conformity to international accreditation like ASTM, EN, BS, DIN, JIS, GB, etc., penetrating to Europe, USA, Japan & other Asia country.

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Universal Plant Services (UPS) is one of the largest comprehensive service providers for the energy industry, providing project management, installation, maintenance and repair services for rotating and fixed equipment for daily maintenance requirements, turnarounds and capital projects.

VELO3D

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Velo3D provides end-to-end metal 3D printing solutions for mission-critical parts in the space, transportation, and energy industries. Unlike conventional metal 3D printing solutions or traditional manufacturing methods, Velo3D helps design engineers build the complex parts they need without compromising their design or part quality.

VIBRATION INSTITUTE

2625 Butterfield Rd Oak Brook, IL 60523 USA PH: 630-654-2254 www.vi-institute.org

The mission of the Vibration Institute is to disseminate practical information on evaluating the behavior and condition of machinery without commercial interest. The Institute offers a variety of programs, including education, training, certification, and opportunities for technical knowledge exchange. Our members share information, procedures, and cutting-edge data through formal training, networking, meetings, and publications. We are a nonprofit association and extremely proud that our vibration analyst personnel certification program was accredited by the American National Standards Institute in March 2010. ANSI, now ANAB (ANSI National Accreditation Board).

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VIEWTECH BORESCOPES

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ViewTech Borescopes is the leading provider of articulating video borescopes in North America, with over 3,000 units in service across a wide range of industries and applications. Our first product, released in 2008, set a new standard for portability, ergonomics and ease-of-use, with its industry-first mechanical, joystick-controlled articulation. This original borescope, the VI, was followed by the VI-Advance, VI-3, and now the just-released VI-4. Visit our booth to learn more about our no-cost, no-obligation demo program & test-drive a ViewTech borescope at your own facility!

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The advanced technologies of Voith Turbo drive machines that move millions of people and goods throughout the world. These technologies safely and efficiently transmit and control power under extreme conditions. The company's extensive range of power transmission products are available for new and retrofit applications which include hydrodynamic variable speed turbo couplings, multistage variable speed drives, high speed and high powered API gearboxes, electrohydraulic actuators, I/P converters, and digital turbine control modules. Featured is the all new VoreconNX, a groundbreaking hydrodynamic power transmission that offers an 8% efficiency improvement in the lower power range

VOLTA INSITE

20488-G Chartwell Center Drive Cornelius, NC 28031 USA PH: 704-651-5166 www.voltainsite.com

At Volta Insite, we understand the importance of uninterrupted operations and the goal of zero downtime. Our predictive maintenance technology starts with Electrical Signature Analysis (ESA). ESA captures current and voltage from critical assets to reveal a distinctive electrical signature. Volta Insite offers a full stack, IoT platform based, automated intelligence solution to act as a constant watch over your electrical assets. We offer real-time operations monitoring; tactical, predictive and targeted preventative maintenance and long-term strategic asset management. We are dedicated to helping businesses grow and maintain their critical infrastructure through our ground-breaking, futuristic products and services.

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WAUKESHA BEARINGS

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N17 W24222 Riverwood Drive, Suite 140 Waukesha, WI 53188 USA PH: 262-506-3000 www.waukeshabearings.com

Waukesha Bearings® is a global leader in the design and manufacture of engineered hydrodynamic bearings and brush seals for high-performing turbomachinery. Backed by robust product development and years of application experience, Waukesha Bearings products are designed for optimized performance and engineered to provide low power consumption, reduced operating temperatures, and increased reliability and efficiency. Waukesha Bearings is part of Dover Precision Components, an integrated provider of performance-critical solutions for rotating and reciprocating machinery.

WEG

6655 Sugarloaf Pkwy Duluth, GA 30097 USA PH: 678-249-2000 www.weg.net

WEG's purpose is to develop technologies and solutions that contribute to a more efficient and sustainable world for everyone. WEG is one of the largest manufacturers of electric motors in the world producing more than 10 million units annually. Committed to growth on a global scale, WEG continually invests in state-of-the-art manufacturing facilities and processes, and the development of reliable and more efficient industrial electrical solutions. WEG offers a diverse and integrated product line that includes motors, drives, soft starters, controls, gearing, panels, transformers, alternators, generators, turbines, and custom solutions.

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Tylova Plzen TX 31600 Czech Republic, Czech Republic PH: (420) 720040034 www.wikov.com

The Wikov company has been active in mechanical engineering for over 140 years. This heritage and vast experience is being passed from generation to generation. For the past 100 years, Wikov has been manufacturing gears and mechanical gearboxes. A combination of the latest machine tools and gear design expertise results in the world class products with state of the art design solutions and extraordinary technical parameters.

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Wood's vibration, dynamics and noise capability (VDN) is the leading provider globally in addressing vibration, reliability, integrity and noise issues on compressors, pumps, piping and associated equipment. Specialist design and field services include pulsation, torsional, lateral, surge simulation, ODS, resonance, water hammer, piping transients, piping integrity checks, pipe stress, acoustic fatigue, FIV, FIT, AIV, and small-bore piping analyses for onshore, offshore and subsea facilities. VDN also provides damping products and absorbers to control vibration. Attend our technical presentations or check out our vibration demo at booth #2413!

WOODWARD

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Woodward is the Turbomachinery Control Expert, providing outstanding control system, actuation, valve, and safety system technologies for steam turbine, gas turbine, and compressor equipment. Woodward strives to reduce total cost of ownership and improve system performance and reliability by increasing availability, efficiency, start performance, and operating range. Independently owned and publically traded, Woodward provides products, services, support, and upgrades for any OEM's turbomachinery systems.

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Intercept Technology products deliver superior, easy-to-use, cost effective, anticorrosion packaging protection for machinery, spare parts, and finished goods. Intercept prevents corrosion and degradation during lengthy shipping or storage cycles without the use of volatiles, vapors, chemicals or coatings. Developed by Bell Labs, Intercept is green, clean, re-usable and recyclable. Intercept is proven 100% safe for all materials, is available in a variety of styles and sizes, as well as packaging on site for you. Intercept performs around the globe in many applications in the harshest of environments and saves money. Visit us at booth 2834.

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YORK PROCESS SYSTEMS

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Our highly technical and innovative engineering staff enables us to meet the needs of industries including chemicals & petrochemicals, fuel transportation & storage, industrial gases, power generation, carbon capture, climate test chambers and pharmaceuticals. Our YORK® Process System team provides you with complete, customized YORK® solutions that take you through design, manufacturing, assembly and testing. Our ability to match your industrial cooling process requirements with the most efficient equipment results in cost savings. Whether you need equipment, help with OEM products, parts, service, or even training support, YORK® solutions from Johnson Controls can help.

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ZAHROOF VALVES

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Zahroof Valves, Inc., (ZVI) is an innovative global provider of compressor valves and associated products to operators of reciprocating gas compressors. ZVI is based in Houston, Texas, and serves energy and industrial markets worldwide. ZVI developed the disruptive StraightFlo[™] compressor valve, which incorporates patented Modular Reed Valve technology. StraightFlo[™] valves deliver step-change improvements over conventional valves in reliability, efficiency, serviceability, and sustainability. As a drop-in replacement for OEM valves, StraightFlo[™] valves are a proven solution for extending run times, reducing power requirements, increasing flow volumes, decreasing maintenance costs, and mitigating methane emissions. For more information, visit www.zahroofvalves.com.

ZENITH EQUIPMENT REPAIR

P. O. Box 34567 Houston, TX 77234 USA PH: 281-922-4061 www.zenithpumpservices.com

Zenith Pumps Services: Turnkey Equipment Removal, Redesign, and Installation. Zenith Pumps, is a full service rotating and reciprocating equipment repair facility. As an independent service provider, we supply unbiased quality repairs that meets or exceeds Original Equipment Manufacture's offerings. Our core strengths, field experience and engineering expertise allow us to provide the best possible solutions to tough equipment problems.

ZETAQUEST TECHNOLOGIES, LLC

13711 Banks View Ct Houston, TX 77059 USA PH: 979-799-5226 www.zetaquest.com

We are developing innovative ways to add vibration damping to common processing plant machinery including piping, pumps, etc. Current products include our linear pipe vibration damper, vent/drain vibration dampers, and our vertical pump/motor vibration damper. We are in a constant Quest for higher damping ratios (Zeta = C/Cc). Your search for damping stops here!



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COMPRESSOR PARTS, REPAIR, OVERHAUL

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| Allap Technical Solutions | 2641 |
| Atlas Copco Gas and Process | 1635 |
| Babbitting Service, Inc. (BSI) | 2542 |
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COMPRESSOR PARTS, REPAIR, OVERHAUL

| Metcar | 1748 |
|---|------|
| Mitsubishi Chemical Group | 2907 |
| Mitsubishi Heavy Industries | 2335 |
| NEA Group USA | 3029 |
| Oliver Equipment Company | 1134 |
| OTC Industrial Technologies | 1947 |
| Precision Machinery Contractors | 1740 |
| Revak Keene Turbomachinery, LP | 2947 |
| Reynolds French & Co. | 2626 |
| Rotating Machinery Services, Inc. | 2041 |
| Samco Enterprises | 2806 |
| Scott Rotary Seals | 2742 |
| Select Laser Alignment | 2218 |
| SES Global | 2818 |
| Southern States Millwrights | 2601 |
| Southwest Impregion | 2703 |
| T.F. Hudgins, an Allied Reliability Brand | 1408 |
| Texas Compression, LLC | 2507 |
| Zahroof Valves | 2044 |

COUPLING REPAIRS

| FlexElement | 1434 |
|-------------------------------|------|
| Goodrich Industrial Couplings | 2135 |
| | |
| Regal Rexnord | 1926 |
| Reliable EDM | 2322 |
| RENK Group | 1327 |
| Riverhawk Company | 2535 |
| Shackelford-Wattner | 2115 |

EXPANDER PARTS, REPAIR AND OVERHAUL

| Atlas Copco Gas and Process | 1635 |
|------------------------------|------|
| Cryostar USA LLC | 2441 |
| Elliott Group | 1719 |
| KnightHawk Engineering, Inc. | 2145 |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

EXPANDER PARTS, REPAIR AND OVERHAUL

| L.A. Turbine | 2617 |
|---|------|
| MAN Energy Solutions SE | 2353 |
| Nikkiso Expander Application Technology | 2435 |
| Precision Machinery Contractors | 1740 |
| Rotating Machinery Services, Inc. | 2041 |
| Rotoflow, An Air Products Business | 2625 |

FIELD SERVICE

| ACE Compressor Services | 2801 |
|---|------|
| Adhesive Services Company | 2707 |
| Artec Machine Systems | 1829 |
| Atlas Copco Gas and Process | 1635 |
| Burckhardt Compression (US) Inc. | 2511 |
| Camfil Power Systems | 1518 |
| Conhagen | 2221 |
| Elliot Group | 1719 |
| Engineering Dynamics, Inc. | 1942 |
| EthosEnergy Field Service | 2217 |
| Flender-Graffenstaden | 2735 |
| Hayward Tyler | 1206 |
| Hoerbiger Compression Technology | 2211 |
| IDEAL ELECTRIC COMPANY | 2624 |
| Integrated Power Services | 1306 |
| Kistler Instrument Corp | 2802 |
| KnightHawk Engineering, Inc. | 2145 |
| Kobelco Compressors America, Inc. | 1519 |
| KSB SupremeServ | 1135 |
| L.A. Turbine | 2617 |
| LOCTITE | 1222 |
| Lone Star Blower and Compressor | 2741 |
| Mayekawa U.S.A., Inc. | 2813 |
| Mitsubishi Heavy Industries | 2335 |
| NEA Group USA | 3029 |
| Nikkiso Expander Application Technology | 2453 |
| | |

FIELD SERVICE

| Philadelphia Gear | 2214 |
|------------------------------------|------|
| Precision Machinery Contractors | 1740 |
| PROGNOST Systems Inc | 1812 |
| Pumps Products & Services, LLC | 1200 |
| PumpWorks 610 | 1221 |
| REXA, Inc. | 1621 |
| Reynolds French & Co. | 2626 |
| Riverhawk Company | 2535 |
| Rotoflow, An Air Products Business | 2625 |
| S2W Contracting LLC | 2321 |
| SES Global | 2818 |
| Shaft Earthing Solutions | 2925 |
| Sigma Engineers & Constructors | 3049 |
| Southwest Research Institute | 1815 |
| TechStar | 2249 |
| Texas Compression, LLC | 2507 |
| Trico Corporation | 1945 |
| Trinity Coatings LLC | 2927 |
| TSS Turbine Specialty Services | 2544 |
| | |

FUEL CONTROL

| Continental Controls Corporation | 3001 |
|----------------------------------|------|

GAS TURBINE PARTS, REPAIR, OVERHAUL

| Adhesive Services Company | 2707 |
|--|------|
| Babbitting Service, Inc. (BSI) | 2542 |
| BryCoat Inc. | 1111 |
| B-W Grinding Service Inc | 2119 |
| Carbide Technologies, Inc | 1220 |
| Continental Controls Corporation | 3001 |
| EthosEnergy Field Service | 2217 |
| F.W. Gartner Thermal Spraying & Curtiss-Wright | 2512 |
| Industrial Info Resources | 2809 |
| Kistler Instrument Corp | 2802 |
| KnightHawk Engineering, Inc. | 2145 |
| | |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

GAS TURBINE PARTS, REPAIR, OVERHAUL

| Lincoln Electric Additive Solutions | 2541 |
|---|------|
| Mitsubishi Chemical Group | 2907 |
| MSHS (Formerly Control Governor Systems | 1618 |
| Omega Renk Bearings Pvt. Ltd. | 2348 |
| Phoenix Laser Solutions | 2646 |
| ProMRO Cloud ERP by Clients First | 2505 |
| Reliable EDM | 2322 |
| Revak Keene Turbomachinery, LP | 2947 |
| Rotating Machinery Services, Inc. | 2041 |
| Scott Rotary Seals | 2742 |
| Select Laser Alignment | 2218 |
| SES Global | 2818 |
| SIFCO ASC | 2820 |
| Sohre Turbomachinery Inc. | 2704 |
| Southern States Millwrights | 2601 |
| Southwest Impreglon | 2703 |
| Stork H&E Turbo Blading | 2628 |
| T.F. Hudgins, an Allied Reliability Brand | 1408 |
| Trinity Coatings LLC | 2927 |
| | |

GEAR BOX REPAIRS

| Artec Machine Systems | 1829 |
|--|------|
| Compressor & Turbine Services, LLC | 2148 |
| EthosEnergy Field Service | 2217 |
| F.W. Gartner Thermal Spraying & Curtiss-Wright | 2512 |
| Flender-Graffenstaden | 2735 |
| Hastik-Baymont, Inc. | 1302 |
| Houston Dynamic Service, Inc. | 2035 |
| Kissling AG | 1746 |
| Philadelphia Gear | 2214 |
| Precision Machinery Contractors | 1740 |
| RENK Group | 1327 |
| Select Laser Alignment | 2218 |
| T.F. Hudgins, an Allied Reliability Brand | 1408 |

GEAR BOX REPAIRS

| Texas Compression, LLC | 2507 |
|--------------------------------|------|
| TSS Turbine Specialty Services | 2544 |
| Wikov Gear | 1113 |

PUMP PARTS AND REPAIR

| A.W. Chesterton Company | 2647 |
|--|------|
| Atlas Copco Gas and Process | 1635 |
| Babbitting Service, Inc. (BSI) | 2542 |
| Best Stainless & Alloys, LP | 3013 |
| Boulden Company | 2240 |
| B-W Grinding Service Inc | 2119 |
| Carbide Technologies, Inc | 1120 |
| CDI Products | 3012 |
| Compressor & Turbine Services, LLC | 2148 |
| Conhagen | 2221 |
| Cryostar USA LLC | 2441 |
| F.W. Gartner Thermal Spraying & Curtiss-Wright | 2512 |
| Greene Tweed | 2244 |
| Hastik-Baymont, Inc. | 1302 |
| Hayward Tyler | 1206 |
| HFW Industries | 1106 |
| Houston Dynamic Service, Inc. | 2035 |
| Hydro Inc. | 1227 |
| Integrated Power Services | 1306 |
| ITT Industrial Process | 1315 |
| Kennametal | 1600 |
| KRAL-USA, Inc. | 1224 |
| Krishnaveni Carbon Products PVT LTD | 1401 |
| KSB SupremeServ | 1135 |
| Leistritz Advanced Technologies Corp. | 1340 |
| LEWA America, Inc. | 1226 |
| Lincoln Electric Additive Solutions | 2541 |
| Metcar | 1748 |
| Mitsubishi Chemical Group | 2907 |
| | |

PUMP PARTS AND REPAIR

| NETZCH Pumps North America, LLC | 2740 |
|---|------|
| Oerlikon | 1951 |
| Oliver Equipment Company | 1134 |
| Precision Machinery Contractors | 1740 |
| Precision Powered Products | 1307 |
| Pump Products & Services, LLC | 1200 |
| Pumpworks 610 | 1221 |
| Reliable EDM | 2322 |
| ROC Carbon Company | 1810 |
| Rotating Equipment Repair | 1339 |
| Ruthman Companies Pumps | 1241 |
| Sealmatic India Ltd. | 1119 |
| SES Global | |
| Shanley Pump & Equipment | 1100 |
| Southern States Millwrights | 2601 |
| Southwest Impreglon | 2703 |
| T.F. Hudgins, an Allied Reliability Brand | 1408 |
| Technogenia, Inc. | 2804 |
| Texas Compression, LLC | 2507 |
| Thomas Pump & Machinery | 1215 |
| Thordon Bearings Inc. | 2320 |
| TSS Turbine Specialty Services | 2544 |
| | |

REAPPLICATION SERVICES

| Kitsler Instrument Corp | 2802 |
|-------------------------|------|
| NEA Group USA | 3029 |

SPIN TESTING

| Houston Dynamic Service, Inc. | 2035 |
|-------------------------------|------|
| Kitsler Instrument Corp | 2802 |
| Mitsubishi Heavy Industries | 2335 |

STEAM TURBINE PARTS, REPAIR AND OVERHAUL

| ACE Compressor Services | 2801 |
|-------------------------|------|
|-------------------------|------|

STEAM TURBINE PARTS, REPAIR AND OVERHAUL

| Adhesive Services Company | 2707 |
|-------------------------------------|------|
| Adron Tool Corp. | 1309 |
| Babbitting Service, Inc. (BSI) | 2542 |
| B-W Grinding Service Inc | 2119 |
| Compressor & Turbine Services, LLC | 2148 |
| Conhagen | 2221 |
| Elliot Group | 1719 |
| HFW Industries | 1106 |
| Honeywell | 3028 |
| Houston Dynamic Service, Inc. | 2035 |
| Knighthawk Engineering | 1206 |
| Hoerbiger Compression Technology | 2211 |
| IDEAL ELECTRIC COMPANY | 2624 |
| Integrated Power Services | 1306 |
| Kistler Instrument Corp | 2802 |
| KnightHawk Engineering, Inc. | 2145 |
| Lincoln Electric Additive Solutions | 2541 |
| MAN Energy Solutions SE | 2353 |
| Metcar | 1748 |
| Metco Joining and Cladding | 1949 |
| Mitsubishi Chemical Group | 2907 |
| Mitsubishi Heavy Industries | 2335 |
| Mayekawa U.S.A., Inc. | 2813 |
| Mitsubishi Heavy Industries | 2335 |
| Omega RENK Bearings Pvt. Ltd. | 2348 |
| Phoenix Laser Solutions | 2646 |
| ProMRO Cloud ERP by Clients First | 2505 |
| Revak Keene Turbomachinery, LP | 1812 |
| ROC Carbon Company | 1810 |
| Rotating Equipment Repair | 1339 |
| Rotating Machinery Services, Inc. | 2041 |
| Scott Rotary Seals | 2742 |
| Select Laser Alignment | 2218 |
| SES Global | 2818 |
| | |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA -

STEAM TURBINE PARTS, REPAIR AND OVERHAUL

| SIFCO ASC | 2820 |
|---|------|
| Southern States Millwrights | 2601 |
| Southwest Impreglon | 2703 |
| Stork H&E Turbo Blading | 2628 |
| T.F. Hudgins, an Allied Reliability Brand | 1408 |
| Texas Bearing Services | 2650 |
| Texas Compression, LLC | 2507 |
| Triveni Turbines | 2605 |
| TSS Turbine Specialty Services | 2544 |

SURFACE FINISHING/BLASTING & EDUIPMENT

| Allap Technical Solutions | 2641 |
|----------------------------|------|
| Metco Joining and Cladding | 1949 |
| Oerlikon | 1951 |
| Southwest Impregion | 2703 |

TANK CLEANING

| Hammelmann Corporation | 2323 |
|------------------------|------|
|------------------------|------|

TURBOCHARGER REPAIR

| FLOWDY | 1112 |
|--|------|
| MAN Energy Solutions SE | 2353 |
| MSHS (Formerly Governor Control Systems) | 1618 |

— AUXILIARY EQUIPMENT

ACCUMULATORS (PULSATION DAMPENERS)

| Engineering Dynamics, Inc. | 1942 |
|----------------------------|------|
| Kitsler Instrument Corp | 2802 |
| Reasontek Corporation | 1107 |

ACOUSTIC EOUIPMENT (SILENCERS)

| 172 | THE 52ND TURBOMACHINERY AND 3 | 39TH PUMP SYMPOSIA |
|----------------------|-------------------------------|--------------------|
| Honeywell | | 3028 |
| Camfil Power Systems | | 1518 |

ACTUATORS

| Drake Controls | 2935 |
|----------------------------------|------|
| Hoerbiger Compression Technology | 2211 |
| Peerless PROCORE | 2540 |
| REXA, Inc. | 1621 |

ALIGNMENT TOOLS AND EQUIPMENT

| Acoem | 3041 |
|---------------------|------|
| Erbessd Instruments | 2948 |
| KEYENCE Corporation | 1110 |
| LUDECA, INC. | 1834 |

BALANCING MACHINES

| Compressor & Turbine Services, LLC | 2148 |
|------------------------------------|------|
| Revak Keene Turbomachinery, LP | 2947 |

BEARINGS - FLUID FILM

| Babbitting Service, Inc. (BSI) | 2542 |
|---------------------------------|------|
| D&S Engineered Products | 2606 |
| Kingsbury, Inc. | 2327 |
| Omega RENK Bearings Pvt. Ltd. | 2348 |
| Reevak Keene Turbomachinery, LP | 2947 |
| Texas Bearing Services | 2650 |
| Waukesha Bearings | 2752 |

BEARINGS - ISOLATORS

| | Inpro/Seal | 2653 |
|--|------------|------|
|--|------------|------|

BEARINGS - MAGNETIC

| CEROBEAR GmBH | 2146 |
|---------------------------|------|
| SKF Magnetic Mechatronics | 2141 |
| Waukesha Bearings | 2752 |

BEARINGS - ROLLING-ELEMENT

| CEROBEAR GmBH | 2146 |
|---------------|------|
|---------------|------|

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

BEARINGS - ROLLING-ELEMENT

| Thordon Bearings Inc. | 2320 |
|------------------------|------|
| Texas Bearing Services | 2650 |

BEARINGS - ROLLING-ELEMENT-PROTECTION

| CEROBEAR GmBH | 2146 |
|---------------|------|

BEARINGS - TEMPERATURE SENSORS

| Cutsforth, Inc. | 1306 |
|------------------------|------|
| Scott Rotary Seals | 2742 |
| Texas Bearing Services | 2650 |

BEARINGS - THRUST

| Boulden Company | 2240 |
|-------------------------------------|------|
| CEROBEAR GmBH | 2146 |
| D&S Engineered Products | 2606 |
| Greene Tweed | 2244 |
| Kingsbury, Inc. | 2327 |
| Krishnaveni Carbon Products PVT LTD | 1401 |
| Omega RENK Bearings Pvt. Ltd. | 2348 |
| ROC Carbon Company | 1810 |
| Scott Rotary Seals | 2742 |
| Waukesha Bearings | 2752 |
| Texas Bearing Services | 2650 |
| | |

BLOWERS

| Aerzen USA | 2919 |
|--------------------------------|------|
| Houston Dynamic Service, Inc. | 2035 |
| Lonestar Blower and Compressor | 2741 |
| Stork H&E Turbo Blading | 2628 |
| TEXEL-SEIKOW U.S.A., Inc. | 1101 |

BORESCOPES

| Viewtech Borescopes | 2416 |
|---------------------|------|
|---------------------|------|

CENTRIFUGES

| LOCTITE | 1222 |
|---------|------|

CLUTCHES

| HILCO | 2713 |
|---------------|------|
| Regal Rexnord | 1926 |
| RENK Group | 1327 |

COMPRESSED AIR DRYERS

| Case iZ | 2520 |
|-----------------------------|------|
| OTC Industrial Technologies | 1947 |

COMPRESSORS, AIR

| Aerzen USA | 2919 |
|---------------------------------|------|
| Case iZ | 2520 |
| FIMA Maschinenbau GmbH | 3043 |
| Lone Star Blower and Compressor | 2741 |
| OTC Industrial Technologies | 1947 |

CONDITION MONITORING

| Acoem | 3041 |
|---------------------------------|------|
| Artesis Technology Systems A.S. | 3021 |
| Cutsforth, Inc. | 1306 |
| Erbessd Instruments | 2948 |
| Honeywell | 3028 |
| Kongsberg Maritime Inc. | 2851 |
| LUDECA, INC. | 1834 |
| Shaft Earthing Solutions | 2925 |
| TechStar | 2249 |
| Torquemeters Limited | 2421 |

CONTROL & CONTROL SYSTEMS

| Dewesoft | 2908 |
|----------------------------------|------|
| Drake Controls | 2935 |
| Hoerbiger Compression Technology | 2211 |
| L.A. Turbine | 2617 |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

CONTROL & CONTROL SYSTEMS

| MSHS (Formerly Governor Control Systems) | 1618 |
|--|------|
| Voith Turbo | 2341 |

CONTROLS

| ACE Compressor Services | 2801 |
|-------------------------|------|
| Drake Controls | 2935 |
| REXA, Inc. | 1621 |
| Sparkcognition | 2604 |
| Voith Turbo | 2341 |
| WEG | 1605 |

CONTROLS, ELECTRIC MOTORS

| ABB | 2835 |
|-----------------------------------|------|
| e+a | 1622 |
| Ideal Electric Company | 2624 |
| Toshiba International Corporation | 2901 |

COOLERS - AFTER

| SPICO Corporation | 2052 |
|-------------------|------|

COOLERS - INTER

| ACE Compressor Services | 2801 |
|-------------------------|------|
| SPICO Corporation | 2052 |

COUPLINGS - MAGNETIC

| IC FLOW CONTROLS, INC. 1242 | |
|-----------------------------|--|
|-----------------------------|--|

COUPLINGS - MECHANICAL

| Coupling Corporation of Ar | nerica | 1827 |
|----------------------------|-------------------------------|-------------------|
| Flex Element | | 1434 |
| IC FLOW CONTROLS, INC. | | 1242 |
| Regal Rexnord | | 1926 |
| RENK Group | | 1327 |
| Riverhawk Company | | 2535 |
| 176 | THE 52ND TURBOMACHINERY AND 3 | 9TH PUMP SYMPOSIA |

COUPLINGS - MECHANICAL

| Shackelford-Wattner | 2115 |
|---------------------|------|
| Voith Turbo | 2341 |

DATA ACQUISITION

| Dewesoft | 2908 |
|----------------------------|------|
| Engineering Dynamics, Inc. | 1942 |
| Kongsberg Maritime Inc. | 2851 |
| Shaft Earthing Solutions | 2925 |
| Shackelford-Wattner | 2115 |
| Voith Turbo | 2341 |

DIAPHRAGMS

| Riverhawk Company | 2535 |
|-------------------|------|
|-------------------|------|

DRIVERS - ELECTRIC MOTORS

| ABB | 2835 |
|-----------------------|------|
| e+a | 1622 |
| Philadelphia Gear | 2214 |
| PMC Technologies Inc. | 1240 |
| Voith Turbo | 2341 |

EFFICIENCY IMPROVEMENT FOR GAS TUBINES

| Torquemeters Limited 2421 | |
|---------------------------|--|
|---------------------------|--|

ENERGY RECOVERY DEVICES

| Case iZ | 2520 |
|---------|------|
|---------|------|

EXPANSION JOINTS

| EagleBurgmann Industries LP | 1627 |
|-----------------------------|------|
| Peerless PROCORE | 2540 |
| Schock Manufacturing | 3045 |

FASTENERS

| Nord-Lock Group | 2705 |
|-----------------|------|
|-----------------|------|

FILTERS & FILTRATION SYSTEMS

| Boll Filter Corporation | 2926 |
|---|------|
| Camfil Power Systems | 1518 |
| FlexaSeal Engineered Seals and Systems, LLC | 2611 |
| HILCO | 2713 |
| John Crane | 1835 |
| Lube-Power, Inc | 1237 |
| Schock Manufacturing | 3045 |
| Solberg Oil Mist Eliminators | 1503 |

FLOW CONTROL DEVICES

| Continental Controls Corporation | 3001 |
|----------------------------------|------|
| Hy-Lok USA | 2918 |
| Reasontek Corporation | 1107 |
| REXA, Inc. | 1621 |

FLOW METERS

| IC FLOW CONTROLS, INC. | 1242 |
|------------------------|------|
| KRAL-USA, Inc. | 1224 |
| Peerless PROCURE | 2540 |

GASKETS

| Eagle Gasket | 1203 |
|---|------|
| EagleBurgmann Industries LP | 1627 |
| Hy-Lok USA | 2918 |
| Sealing Equipments Products Company (SEPCO) | 1123 |

GEARS AND GEAR BOXES

| Artec Machine Systems | 1829 |
|-----------------------|------|
| Hastik-Baymont, Inc. | 1302 |
| Kissling AG | 1746 |
| Philadelphia Gear | 2214 |
| RENK Group | 1327 |
| Wilkov Gear | 1113 |

GOVERNORS

| Drake Controls | 2835 |
|--|------|
| MSHS (Formerly Governor Control Systems) | 1618 |

HEAT EXCHANGERS

| Ambrell Corporation | 1141 |
|---|------|
| FlexaSeal Engineered Seals and Systems, LLC | 2611 |
| Hy-Lok USA | 2918 |
| Industrial Info Resources | 2809 |
| Specialist Heat Exchangers | 1143 |
| SPICO Corporation | 2052 |
| VELO3D | 1419 |
| | |

HEAT TRANSFER PRODUCTS & SERVICES

| Ambrell Corporation | 1141 |
|------------------------------|------|
| Camfil Power Systems | 1518 |
| Cooling Technology Institute | 2219 |
| Specialist Heat Exchangers | 1143 |

HYDRAULIC FITTING

INLET COOLING FOR GAS TURBINES

| Camfil Power Systems 1 | 1518 |
|------------------------|------|
|------------------------|------|

INSTALLATION EQUIPMENT

| Schock Manufacturing | 3045 |
|----------------------|------|
|----------------------|------|

LUBRICATION SYSTEMS

| THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA | 179 |
|--|------|
| SPICO Corporation | 2052 |
| Specialist Heat Exchangers | 1143 |
| Lube-Power, Inc | 1237 |
| FlexaSeal Engineered Seals and Systems, LLC | 2611 |
| EcoTech & CP Pumpen | 2725 |
| Boll Filter Corporation | 2926 |
| | |

LUBRICATION SYSTEMS

| Trico Corporation | 1945 |
|-------------------|------|
|-------------------|------|

MAGNETS

| IC FLOW CONTROLS, INC. | 1242 |
|------------------------|------|
| PMG Technologies | 1240 |

MIXERS

| Hastik-Baymont, Inc. | 1302 |
|------------------------|------|
| IC FLOW CONTROLS, INC. | 1242 |
| Technogenia, Inc. | 2804 |

PACKING

| EagleBurgmann Industries LP | 1627 |
|--|------|
| Hoerbiger Compression Technology | 2211 |
| Sealing Equipment Products Company (SEPCO) | 1123 |

POLYMER PARTS & PRODUCTS

| Boulden Company | 2240 |
|-----------------------|------|
| PRLC | 2825 |
| Thordon Bearings Inc. | 2320 |

PRESSURE VESSELS

| Boll Filter Corporation | 2926 |
|-------------------------|------|
| Reasontek Corporation | 1107 |
| SPICO Corporation | 2052 |

SEALS - ANNULAR (LABYRINTH, CARBON)

| Boulden Company | 2240 |
|-------------------------------------|------|
| Inpro/Seal | 2653 |
| Krishnaveni Carbon Products PVT LTD | 1401 |
| Mitsubishi Chemical Group | 2907 |

SEALS - DRY GAS

| Boll Filter Corporation | 2926 |
|-------------------------|------|
|-------------------------|------|

SEALS - DRY GAS

| EagleBurgmann Industries LP | 1627 |
|-----------------------------|------|
| John Crane | 1835 |
| Kaydon Ring & Seal, Inc. | 2143 |
| Specialist Heat Exchangers | 1143 |

SEALS - MECHANICAL

| A.W. Chesterton Company | 2647 |
|---|------|
| Allap Technical Solutions | 2641 |
| Eagle Gasket | 1203 |
| EagleBurgmann Industries LP | 1627 |
| EcoTech & CP Pumpen | 2725 |
| Flexaseal Engineered Seals and Systems, LLC | 2611 |
| John Crane | 1835 |
| Metcar | 1748 |
| Sealing Equipment Products Company (SEPCO) | 1123 |
| Sealmatic India Ltd. | 1119 |

SEALS - NON-MECHANICAL

| CDI Products | 3012 |
|-------------------------------|------|
| Douglas Electrical Components | 2553 |
| Eagle Gasket | 1203 |
| Inpro/Seal | 2653 |

SEALS - RESILIENT METAL

| Eagle Gasket | 1203 |
|--------------|------|
|--------------|------|

SHAFT-CURRENT CONTROL EQUIPMENT

| Inpro/Seal | 2653 |
|------------------------------|------|
| Schunk Carbon Technology LLC | 1304 |

SHIMS

| LUDECA, INC. 1834 | |
|-------------------|--|
|-------------------|--|

STARTERS AND STARTING MOTORS

| e+a | 1622 |
|-------|------|
| HILCO | 2713 |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

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THERMOCOUPLES

| Kongsberg Maritime Inc. | 2851 |
|-------------------------|------|
| Peerless PROCUTRE | 2540 |

TOOLS

| Bass Tool & Supply, Inc | 1122 |
|-------------------------|------|
| ViewTech Borescopes | 2416 |

TORQUE METERS

| Bass Tool & Supply, Inc | 1122 |
|-------------------------|------|
| Riverhawk Company | 2535 |
| Torquemeters Limited | 2421 |

USED EQUIPMENT, GENERAL

| OTC Industrial Technologies | 1947 |
|-----------------------------|------|
|-----------------------------|------|

VACUUM EQUIPMENT

| Aerzen USA | 2919 |
|------------------------------|------|
| Solberg Oil Mist Eliminators | 1503 |

VALVES

| Allap Technical Solutions | 2641 |
|----------------------------------|------|
| Atlantic Group, Inc. | 1127 |
| Carbide Technologies, Inc | 1220 |
| Continental Controls Corporation | 3001 |
| EcoTech & CP Pumpen | 2725 |
| Hy-Lok USA | 2918 |
| Peerless PROCURE | 2540 |
| QIUBAO VALVE CO., LTD | 1205 |
| Zahroof Valves | 2044 |
| | |

VARIABLE FREQUENCY DRIVES

| ABB | 2835 |
|-----------------------------------|------|
| PMC Technologies Inc | 1240 |
| Toshiba International Corporation | 2901 |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

VIBRATION MEASURING, MONITORING, ANALYSIS

| Acoem | 3041 |
|------------------------------|------|
| Alta Solutions Inc. | 2829 |
| Dewesoft | 2653 |
| Emerson | 1711 |
| Erbessd Instruments | 2948 |
| Kongsberg Maritime Inc. | 2851 |
| LUDECA, INC. | 1834 |
| SDT Ultrasound Solutions Inc | 3007 |
| TechStar | 2249 |

----- DESIGN AND ANALYSIS SUPPORT

AEROSPACE APPLICATIONS

| 3D Systems | 2849 |
|-----------------------|------|
| Adron Tool Corp. | 1309 |
| Ambrell Corporation | 1141 |
| Concepts NREC | 1826 |
| Oerlikon | 1951 |
| VELO3D | 1419 |
| Xtend Packaging, Inc. | 2834 |

GAS TURBINES

| Adron Tool Corp. | 1309 |
|---------------------------------------|------|
| CCC (Compressor Controls Corporation) | 1935 |
| Concepts NREC | 1826 |
| Cutsforth Inc. | 1306 |
| Dynaflow Research Group | 1753 |
| HILCO | 2713 |
| Industrial Info Resources | 2809 |
| Oerlikon | 1951 |
| SoftIn Way Inc. | 1619 |
| VELO3D | 1419 |
| Xtend Packaging, Inc. | 2834 |

OIL & GAS PIPING AND SYSTEMS

| Dynaflow Research Group | 1753 |
|-----------------------------|------|
| Fluke Reliability | 1126 |
| ITT Industrial Process | 1315 |
| PROGNOST Systems Inc | 1812 |
| Sparkcognition | 2604 |
| Xtend Packaging, Inc. | 2834 |
| ZetaQuest Technologies, LLC | 1647 |

PUMPS

| Conhagen | 2221 |
|---------------------------------------|------|
| Cutsforth Inc | 1306 |
| Hayward Tyler | 1206 |
| Honeywell | 3028 |
| Hydro Inc. | 1227 |
| Industrial Info Resources | 2809 |
| ITT Industrial Process | 1315 |
| KRAL-USA, Inc. | 1224 |
| KSB SupremeServ | 1135 |
| Leistritz Advanced Technologies Corp. | 1340 |
| LEWA America, Inc. | 1226 |
| Oerlikon | 1951 |
| Precision Powered Products | 1307 |
| Ruthman Companies Pumps | 1241 |
| Sealmatic India Ltd. | 1119 |
| Thomas Pump & Machinery | 1215 |
| Thordon Bearings Inc. | 2320 |
| VELO3D | 1419 |
| Xtend Packaging, Inc. | 2834 |

TURBOMACHINERY

| 3D Systems | 2849 |
|----------------------------------|------|
| Adron Tool Corp. | 1309 |
| Atlas Copco Gas and Process | 1635 |
| Burckhardt Compression (US) Inc. | 2511 |

TURBOMACHINERY

| CCC (Compressor Controls Corporation) | 1935 |
|---------------------------------------|------|
| Concepts NREC | 1826 |
| Cutsforth, Inc | 1306 |
| Elliott Group | 1719 |
| Fox Rotating Equipment Solutions | 2220 |
| Hanwha Power Systems Americas, INC | 3024 |
| John Crane | 1835 |
| L.A. Turbine | 2617 |
| MAN Energy Solutions SE | 2353 |
| McNally LLC | 2050 |
| NEA Group USA | 3029 |
| onepredict | 1353 |
| Reasontek Corporation | 1107 |
| Rotoflow, An Air Products Business | 2625 |
| Sigma Engineers & Constructors | 3049 |
| SoftInWay Inc. | 1619 |
| Southwest Research Institute | 1815 |
| Sparkcognition | 2604 |
| TurboTides, Inc. | 1845 |
| VELO3D | 1419 |
| Xtend Packaging, Inc. | 2834 |
| | |

DISTRIBUTORS

PUMP RELATED EQUIPMENT

| Fluke Reliability | 1126 |
|--------------------------|------|
| Hammelmann Corporation | 2323 |
| Oliver Equipment Company | 1134 |

PUMPS

| EcoTech & CP Pumpen | 2725 |
|-----------------------------|------|
| Hammelmann Corporation | 2323 |
| Hastik-Baymont, Inc. | 1302 |
| Integrated Power Servicesjj | 1306 |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

PUMPS

| | 1 |
|---|------|
| KSB SupremeServ | 1135 |
| Leistritz Advanced Technologies Corp. | 1340 |
| LOCTITE | 1222 |
| Nikkiso Expander Application Technology | 2435 |
| Oliver Equipment Company | 1134 |
| Pump Products & Services, LLC | 1200 |
| Rotating Equipment Repair | 1339 |
| Thomas Pump & Machinery | 1215 |

- EDUCATION/RESEARCH/TRAINING

CONSULTING - MAINTENANCE & RELIABILITY

| Artesis Technology Systems A.S. | 3021 |
|---------------------------------------|------|
| Becht | 2547 |
| CCC (Compressor Controls Corporation) | 1935 |
| Engineering Dynamics, Inc. | 1942 |
| Equity Engineering Group, The | 1522 |
| Fluke Reliability | 1126 |
| Fox Rotating Equipment Solutions | 2220 |
| NEA Group USA | 3029 |
| PROGNOST Systems Inc | 1812 |
| Shaft Earthing Solutions | 2925 |
| Spectra Quest, Inc | 2440 |
| Trico Corporation | 1945 |
| Zahroof Valves | 2044 |

CONTINUING EDUCATION CREDIT COURSES

| Concepts NREC | 1826 |
|--------------------------------|------|
| Hydraulic Institute | 1321 |
| TEES Turbomachinery Laboratory | 1116 |
| Vibration Institute | 1643 |

EDUCATIONAL COURSES

| American Society of Mechanical Engineers (ASME) | 2415 |
|---|------|
|---|------|

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

186 —

EDUCATIONAL COURSES

| HSI | 1739 |
|--------------------------------|------|
| Hydraulic Institute | 1321 |
| POWERGEN International | 3005 |
| Spectra Quest, Inc | 2440 |
| Trico Corporation | 1945 |
| TEES Turbomachinery Laboratory | 1116 |
| Vibration Institute | 1643 |

PUMPS/FLUID HANDLING

| Hermetic Pumps Imc. | 1527 |
|--------------------------------|------|
| HSI | 1739 |
| Hydraulic Institute | 1321 |
| Simerics, Inc. | 3023 |
| Thomas Pump & Machinery | 1215 |
| TEES Turbomachinery Laboratory | 1116 |

TURBINES/ROTATING EQUIPMENT

| Burckhardt Compression (US) Inc. | 2511 |
|----------------------------------|------|
| Honeywell | 3028 |
| HSI | 1739 |
| LUDECA, INC. | 1834 |
| Rotating Equipment Repair | 1339 |
| Sohre Turbomachinery Inc. | 2704 |
| Structural Technologies | 2522 |
| Triveni Turbines | 2605 |
| TEES Turbomachinery Laboratory | 1116 |

FINANCE OPERATIONS SOFTWARE

MACHINERY SERVICES

3D SCANNING AND INSPECTION

| FLOWDY | 1112 |
|-------------------------------|------|
| ALIGNMENT | |
| Fluke Reliability | 1126 |
| S2W Contracting LLC | 2321 |
| Select Laser Alignment | 2218 |
| ANALYSIS | |
| Engineering Dynamics, Inc. | 1942 |
| Equity Engineering Group, The | 1522 |
| Fluke Reliability | 1126 |
| Mechanical Solutions, Inc. | 1335 |
| PROGNOST Systems Inc | 1812 |
| Sytek Electric | 1243 |

BALANCING

| Erbessd Instruments | 2948 |
|-------------------------------|------|
| FlexElement | 1434 |
| Pump Products & Services, LLC | 1200 |
| Sytek Electric | 1243 |
| Triveni Turbines | 2605 |

COMPONENT DEVELOPMENT & TESTING

| Douglas Electrical Components | 2553 |
|-------------------------------|------|
|-------------------------------|------|

COMPRESSOR PACKING

| Hitachi Global Air Power | 2427 |
|-----------------------------|------|
| Mayekawa USA, Inc. | 2813 |
| OTC Industrial Technologies | 1947 |

CONDITION MONITORING

| 188 THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA | | |
|--|--------|------|
| Bently Nevada | | 1819 |
| Artesis Technology System | s A.S. | 3021 |

CONDITION MONITORING

| CCC (Compressor Controls Corporation) | 1935 |
|---------------------------------------|------|
| Emerson | 1711 |
| Erbessd Instruments | 2948 |
| Hydro Inc. | 1227 |
| MachVib Services Corporation | 2151 |
| Mechanical Solutions, Inc. | 1335 |
| Poseidon Systems | 1311 |
| SDT Ultrasound Solutions Inc | 3007 |
| Volta Insite | 2053 |

CONTROL SYSTEMS

| CCC (Compressor Controls Corporation) | 1935 |
|--|------|
| Drake Controls | 2935 |
| Lone Star Blower and Compressor | 2741 |
| MSHS (Formerly Governor Control Systems) | 1618 |
| Sigma Engineers & Constructors | 3049 |

INDUSTRIAL CONTROLS

| Case iZ | 2520 |
|--------------------------------|------|
| Douglas Electrical Components | 2553 |
| Sigma Engineers & Constructors | 3049 |

DESIGN AUDITS

EFFICIENCY IMPROVEMENT FOR GAS TURBINES

ELECTRIC DISCHARGE MACHINING (EDM)

| Adron Tool Corp. | 1309 |
|---------------------------|------|
| Reliable EDM | 2322 |
| Sohre Turbomachinery Inc. | 2704 |

FAILURE ANALYSIS

| A.W. Chesterton Company | 2647 |
|----------------------------------|------|
| Bently Nevada | 1819 |
| Dewesoft | 2908 |
| Equity Engineering Group, The | 1522 |
| Fox Rotating Equipment Solutions | 2220 |
| Hydro Inc. | 1227 |
| McNally Inc | 2050 |
| Shaft Earthing Solutions | 2925 |
| FOUNDATION REPAIR AND GROUTING | |
| Adhesive Services Company | 2707 |
| S2W Contracting LLC | 2321 |
| Structural Technologies | 2522 |
| GROUTING | |
| Master Builders Solutions | 1843 |
| S2W Contracting LLC | 2321 |
| INFRARED IMAGING | |
| I-care Reilabiilty Inc | 2814 |
| INSTALLATION | |
| S2W Contracting LLC | 2321 |
| Sparkcognition | 2604 |
| Structural Technologies | 2522 |
| LABORATORY TESTING SERVICES | |
| Dewesoft | 2908 |
| Gulf Coast Calibration | 1201 |
| Hydro Inc. | 1227 |
| Trico Corporation | 1945 |
| LUBRICATION SYSTEMS | |
| HILCO | 2713 |
| | 1 |

LUBRICATION SYSTEMS

| Lube-Power, Inc | 1237 |
|----------------------------|------|
| Poseidon Systems | 1311 |
| Reynolds French & Co. | 2626 |
| Specialist Heat Exchangers | 1143 |

MACHINE CONDITION MONITORING

| A.W. Chesterton Company | 2647 |
|------------------------------|------|
| ABB | 2835 |
| Acoem | 3041 |
| Alta Solutions Inc. | 2829 |
| Emerson | 1711 |
| Hansford Sensors Inc | 2816 |
| I-care Reliability Inc | 2814 |
| lstec | 3037 |
| MachVib Services Corporation | 2151 |
| Poseidon Systems | 1311 |
| | |

MACHINERY PROTECTION SYSTEMS

| Alta Solutions Inc. | 2829 |
|--------------------------------|------|
| Emerson | 1711 |
| lstec | 3037 |
| Kennametal | 1600 |
| MachVib Services Corporation | 2151 |
| Sigma Engineers & Constructors | 3049 |
| I-care Reliability Inc | 2814 |
| Istec | 3037 |
| MachVib Services Corporation | 2151 |
| Poseidon Systems | 1311 |

MAINTENANCE SYSTEMS

| Volta Institute | 2053 |
|-----------------|------|
|-----------------|------|

METALLURGY

Allap Technical Solutions

2641

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

OIL PURIFICATION

| UIL PURIFIGATION | |
|---------------------------------|------|
| Boil Filter Corporation | 2926 |
| Poseidon Systems | 1311 |
| PACKAGING | |
| Lube-Power, Inc | 1237 |
| PREDICTIVE MAINTENANCE | |
| Artesis Technology Systems A.S. | 3021 |
| Hansford Sensors Inc | 2816 |
| I-care Reliability Inc | 2814 |
| Mechanical Solutions, Inc. | 1335 |
| Poseidon Systems | 1311 |
| SDT Ultrasound Solutions Inc | 3007 |
| PRESSURE TESTING | |
| Production Machine & Tool | 2549 |
| PULSATION ANALYSIS | |
| Dynaflow Research Group | 1753 |
| Reasontek Corporation | 1107 |
| Southwest Research Institute | 1815 |
| RESEARCH AND DEVELOPMENT | |
| Cryostar USA LLC | 2441 |
| Southwest Research Institute | 1815 |

ROTORDYNAMICS ANALYSIS

| Conhagen | 2221 |
|----------------------------------|------|
| FlexElement | 1434 |
| Fox Rotating Equipment Solutions | 2220 |
| McNally LLC | 2050 |
| Mechanical Solutions, Inc. | 1335 |
| Southwest Research Institute | 1815 |

STAGE DESIGN

| McNally LLC 2050 | |
|------------------|--|
|------------------|--|

ULTRASOUND TESTING

| SDT Ultrasound Solutions Inc | 3007 |
|------------------------------|------|
|------------------------------|------|

VIBRATION ANALYSIS

| Alta Solutions Inc. | 2829 |
|-------------------------------|------|
| Artec Machine Systems | 1829 |
| Emerson | 1711 |
| Equity Engineering Group, The | 1522 |
| Hansford Sensors Inc | 2816 |
| I-care Reliability Inc | 2814 |
| McNally Inc | 2050 |
| Mechanical Solutions, Inc. | 1335 |
| Sytek Electric | 1243 |
| TechStar | 2249 |
| ZetaQuest Technologies, LLC | 1647 |

WELDING

| Ambrell Corporation | 1141 |
|---------------------|------|
| Lube-Power, Inc | 1237 |
| Sytek Electric | 1243 |

MACHINERY ANALYSIS SOFTWARE

CAD

| KEYENCE Corporation | 1110 |
|---------------------|------|
|---------------------|------|

CFD

| Sealmatic India Ltd.1Simerics, Inc.3SoftInWay Inc.1 | 100 |
|---|------|
| Sealmatic India Ltd.1Simerics, Inc.3 | 1845 |
| Sealmatic India Ltd. 1 | 1619 |
| - | 3023 |
| Dynanow Research Group | 1119 |
| Dynaflow Research Group 1 | 1753 |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

DATA MANAGEMENT

| Case iZ | 2520 |
|---------------------|------|
| KEYENCE Corporation | 1110 |
| TurboTides, Inc. | 1845 |

DESIGN AND ANALYSIS

| Concepts NREC | 1826 |
|---------------------|------|
| KEYENCE Corporation | 1110 |
| Simerics, Inc. | 3023 |
| SoftInWay Inc. | 1619 |
| TurboTides, Inc. | 1845 |

INDUSTRIAL DISTRIBUTION

| ProMRO Cloud ERP by Clients First | 2505 |
|-----------------------------------|------|
|-----------------------------------|------|

LIFE PREDICTION

| Volta Insite | 2053 |
|--------------|------|
|--------------|------|

MAINTENANCE AND RELIABILITY

| Artesis Technology Systems A.S. | 3021 |
|-----------------------------------|------|
| Bently Nevada | 1819 |
| Hansford Sensors Inc | 2816 |
| I-care Reliability Inc | 2814 |
| Integrated Power Services | 1306 |
| KEYENCE Corporation | 1110 |
| onepredict | 1353 |
| ProMRO Cloud ERP by Clients First | 2505 |
| Volta Insite | 2053 |
| ZetaQuest Technologies, LLC | 1647 |

PIPE FLOW ANALYSIS

| Applied Flow Technology | 1422 |
|-------------------------|------|
| Simerics, Inc. | 3023 |

PUMP SELECTION

| Precision Powered Products | 1307 |
|----------------------------|------|
| Simerics, Inc. | 3023 |

ROTORDYNAMICS

| SoftInWay Inc. | 1619 |
|------------------|------|
| TurboTides, Inc. | 1845 |

STRESS ANALYSIS

| Structural Technologies | 2522 |
|-------------------------|------|
|-------------------------|------|

VIBRATION ANALYSIS

| lutions Inc. 2829 |
|---|
| Nevada 1819 |
| ow Research Group 1753 |
| edict 1353 |
| NOST Systems Inc 1812 |
| ural Technologies 2522 |
| nsite 2053 |
| NOST Systems Inc 1812 ural Technologies 2522 |

----- MANUFACTURERS

COMPRESSOR - CENTRIFUGAL

| Cincinnati Gearing Systems | 2243 |
|------------------------------------|------|
| EthosEnergy Field Service | 2217 |
| FIMA Maschinenbau GmbH | 3043 |
| Hanwha Power Systems Americas, INC | 3024 |
| Hitachi Global Air Power | 2427 |
| Ingersoll Rand | 2635 |
| Kobelco Compressors America, Inc. | 1519 |
| Solar Turbines Incorporated | 2125 |

COMPRESSOR - INTEGRAL GEAR

| Cincinnati Gearing Systems | 2243 |
|----------------------------|------|
|----------------------------|------|

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA -

COMPRESSOR - INTEGRAL GEAR

| FIMA Maschinenbau GmbH | 3043 |
|-----------------------------------|------|
| Kobelco Compressors America, Inc. | 1519 |

COMPRESSOR - RECIPROCATING

| Ingersoll Rand | 2635 |
|----------------|------|
| Zahroof Valves | 2044 |

COMPRPESSOR - ROTARY

| Burckhardt Compression (US) Inc. | 2511 |
|----------------------------------|------|
| Hitachi Global Air Power | 2427 |
| Ingersoll Rand | 2635 |
| Mayekawa U.S.A., Inc. | 2813 |

COMPRESSOR - SCREW

| Aerzen USA | 2919 |
|-----------------------------------|------|
| Hitachi Global Air Power | 2427 |
| Ingersoll Rand | 2635 |
| Kobelco Compressors America, Inc. | 1519 |
| Mayekawa U.S.A., Inc. | 2813 |

ELECTRIC MOTORS

| ABB | 2835 |
|-----------------------------------|------|
| e+a | 1622 |
| HD Hyundai Electric | 1341 |
| IDEAL ELECTRIC COMPANY | 2624 |
| Leo Pump US | 2600 |
| PMC Technologies Inc | 1240 |
| Toshiba International Corporation | 2901 |
| WEG | 1605 |

EXPANDERS

| Cincinnati Gearing Systems | 2243 |
|----------------------------|------|
| Cryostar USA LLC | 2441 |

EXPANDERS

| L.A. Turbine | 2617 |
|---|------|
| Nikkiso Expander Application Technology | 2435 |
| Rotoflow, An Air Products Business | 2625 |

GEARS AND GEARBOXES

| Artec Machine Systems | 1829 |
|----------------------------|------|
| Cincinnati Gearing Systems | 2243 |
| Kissling AG | 1746 |
| Philadelphia Gear | 2214 |
| WEG | 1605 |
| Wikov Gear | 1113 |

GENERATORS

| e+a | 1622 |
|------------------------|------|
| HD Hyundai Electric | 1341 |
| IDEAL ELECTRIC COMPANY | 2624 |
| WEG | 1605 |

IMPELLERS

| FIMA Maschinenbau GmbH | 3043 |
|------------------------|------|
| FLOWDY | 1112 |
| KTS Turbobillet X | 2915 |
| Technogenia, Inc. | 2804 |

MECHANICAL SEAL

| A.W. Chesterton Company | 2647 |
|--|------|
| Sealing Equipment Products Company (SEPCO) | 1123 |

PUMP - CENTRIFUGAL

| Cryostar USA LLC | 2441 |
|---------------------------|------|
| Dickow Pump Company, Inc. | 1300 |
| EcoTech & CP Pumpen | 2725 |
| Hayward Tyler | 1206 |
| Hermetic Pumps Inc. | 1527 |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA -

PUMP - CENTRIFUGAL

| ITT Industrial Process | 1315 |
|---|------|
| Kennametal | 1600 |
| Leo Pump US | 2600 |
| LEWA America, Inc. | 1226 |
| Nikkiso Expander Application Technology | 2435 |
| Precision Powered Products | 1307 |
| PumpWorks 610 | 1221 |
| Roth Pump Company | 1217 |
| Ruthman Companies Pumps | 1241 |
| Sealmatic India Ltd. | 1119 |
| TEXEL-SEIKOW U.S.A., Inc. | 1101 |

PUMP - DISK FLOW

| Leo Pump US | 2600 |
|-------------|------|

PUMPS - POSITIVE DISPLACEMENT

| Boerger, LLC | 1235 |
|---------------------------------------|------|
| Hammelmann Corporation | 2323 |
| KRAL-USA, Inc. | 1224 |
| Leistritz Advanced Technologies Corp. | 1340 |
| LEWA America, Inc. | 1226 |
| NETZSCH Pumps North America, LLC | 2740 |
| Roth Pump Company | 1217 |
| Shanley Pump & Equipment | 1100 |

PUMP - SEALLESS

| Hayward Tyler | 1206 |
|---------------------------------------|------|
| Hermetic Pumps Inc. | 1527 |
| ITT Industrial Process | 1315 |
| Leistritz Advanced Technologies Corp. | 1340 |
| LEWA America, Inc. | 1226 |
| Roth Pump Company | 1217 |
| Ruthman Companies Pumps | 1241 |
| TEXEL-SEIKOW U.S.A., Inc. | 1101 |

PUMP - VACUUM

| Hermetic Pumps Inc. | 1527 |
|-------------------------------------|------|
| Krishnaveni Carbon Products PVT LTD | 1401 |

PUMP - VERTICAL TURBINE

| Leo Pump US | 2600 |
|----------------------------|------|
| Precision Powered Products | 1307 |
| PumpWorks 610 | 1221 |
| Ruthman Companies Pumps | 1241 |

TURBINES - GAS

| Cincinnati Gearing Systems | 2243 |
|----------------------------------|------|
| Continental Controls Corporation | 3001 |
| FLOWDY | 1112 |
| Leo Pump US | 2600 |
| Solar Turbines Incorporated | 2125 |
| Stork H&E Turbo Blading | 2628 |
| Trinity Coatings LLC | 2927 |

TURBINES - STEAM

| Compressor & Turbine Services, LLC | 2148 |
|------------------------------------|------|
| FLOWDY | 1112 |
| Stork H&E Turbo Blading | 2628 |
| Triveni Turbines | 2605 |
| TSS Turbine Specialty Services | 2544 |
| WEG | 1605 |

MANUFACTURING AND REPAIR SERVICES

CASTINGS

| 3D Systems | 2849 |
|-------------------------------------|------|
| Kimura Foundry America | 2525 |
| Lincoln Electric Additive Solutions | 2541 |
| Phoenix Laser Solutions | 2646 |
| PumpWorks 610 | 1221 |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

CASTINGS

| Q Plus Technologies PVT LTD | 2913 |
|--|------|
| Tycon Alloy Industries (Hong Kong) Co., Ltd. | 2751 |

COATINGS

| BryCoat Inc. | 1111 |
|--|------|
| B-W Grinding Service Inc | 2119 |
| Carbide Technologies, Inc | 1220 |
| F.W. Gartner Thermal Spraying & Curtiss-Wright | 2512 |
| FasTrac - Cornerstone Construction Material | 2640 |
| HFW Industries | 1106 |
| ITW | 2929 |
| Kennametal | 1600 |
| Metco Joining and Cladding | 1949 |
| Schunk Carbon Technology LLC | 1304 |
| SIFCO ASC | 2820 |
| Technogenia, Inc. | 2804 |
| Trinity Coatings LLC | 2927 |
| | |

FORGINGS

| Best Stainless & Alloys, LP | 3013 |
|-----------------------------|------|
| Q Plus Technologies PVT LTD | 2913 |

GRINDING

| Best Stainless & Alloys, LP | 3013 |
|-----------------------------|------|
| BryCoat Inc. | 1111 |
| B-W Grinding Service Inc | 2119 |
| HFW Industries | 1106 |
| Trinity Coatings LLC | 2927 |

IMPELLERS

| KTS Turbobillet X | 2915 |
|-----------------------------|------|
| Q Plus Technologies PVT LTD | 2913 |
| Technogenia, Inc. | 2804 |

IN-PLANT MACHINING

| Production Machine & Tool | 2549 |
|---------------------------|------|
| Triveni Turbines | 2605 |

LASER MACHINING

| Phoenix Laser Solutions | 2646 |
|-------------------------|------|
| SLM Solutions | 2827 |

MACHINING

| Best Stainless & Alloys, LP | 3013 |
|--|------|
| CDI Products | 3012 |
| Custom Engineering Company | 2700 |
| Eagle Gasket | 1203 |
| FlexElement | 1434 |
| HILLTOP Technology Laboratory, Inc. | 2906 |
| IDEAL ELECTRIC COMPANY | 2624 |
| Integrated Power Services | 1306 |
| KTS Turbobillet X | 2915 |
| Production Machine & Tool | 2549 |
| Q Plus Technologies PVT LTD | 2913 |
| Rotating Equipment Repair | 1339 |
| Tycon Alloy Industries (Hong Kong) Co., Ltd. | 2751 |
| | |

MILLING

| Custom Engineering Company | 2700 |
|-------------------------------------|------|
| HILLTOP Technology Laboratory, Inc. | 2906 |
| KTS Turbobillet X | 2915 |
| Production Machine & Tool | 2549 |
| Q Plus Technologies PVT LTD | 2913 |

PLATING

| BryCoat Inc. | 1111 |
|--------------|------|
| SIFCO ASC | 2820 |

-

WELDING

| Ambrell Corpotation | 1141 |
|----------------------------|------|
| Custom Engineering Company | 2700 |
| Phoenix Laser Solutions | 2646 |

MATERIALS

ALLOYS, METAL

| 3D Systems | 2849 |
|--|------|
| Best Stainless & Alloys, LP | 3013 |
| Custom Engineering Company | 2700 |
| Kennametal | 1600 |
| KSB SupremeServ | 1135 |
| Metco Joining and Cladding | 1949 |
| SLM Solutions | 2827 |
| Tycon Alloy Industries (Hong Kong) Co., Ltd. | 2751 |

CARBON AND CARBON PRODUCTS

| Krishnaveni Carbon Products PVT LTD | 1401 |
|-------------------------------------|------|
| Metcar | 1748 |
| PRLC | 2825 |
| ROC Carbon Company | 1810 |
| Schunk Carbon Technology LLC | 1304 |

CERAMICS

| CEROBEAR GmbH | 2146 |
|------------------------------|------|
| Metco Joining and Cladding | 1949 |
| PRLC | 2825 |
| Schunk Carbon Technology LLC | 1304 |

EPOXY GROUT

| FasTrac - Cornerstone Construction Material | 2640 |
|---|------|
| ITW | 2929 |
| Master Builders Solutions | 1843 |
| Reynolds French & Co. | 2626 |

GRAPHITE

| ROC Carbon Company | 1810 |
|------------------------------|------|
| Schunk Carbon Technology LLC | 1304 |

GROUT, CEMENT

| FasTrac - Cornerstone Construction Material | 2640 |
|---|------|
| Master Builders Solutions | 1843 |
| Reynolds French & Co. | 2626 |
| LUBRICANTS | |
| Royal Purple Synthetic Oil | 2516 |
| MAGNETIC MATERIALS | |
| PMC Technologies Inc | 1240 |
| PACKING | |
| Sealing Equipment Products Company (SEPCO) | 1123 |
| POLYMERS | |
| 3D Systems | 2849 |
| CDI Products | 3012 |
| Greene Tweed | 2244 |
| PRLC | 2825 |

PRLC

Thordon Bearings Inc. 2320

SEALANTS

| FasTrac - Cornerstone Construction Material | 2640 |
|---|------|
| Greene Tweed | 2244 |

– PUBLISHING

BOOKS

| Diesel & Gas Turbine Worldwide/Compressortech2 | 2047 |
|--|------|
| Gas Compression Magazine | 2724 |
| Istec | 3037 |

THE 52ND TURBOMACHINERY AND 39TH PUMP SYMPOSIA

MAGAZINES/PUBLICATIONS

| AGMA – American Gear Manufactures Assoc. | 1501 |
|---|------|
| American Society of Mechanical Engineers (ASME) | 2415 |
| Cooling Technology Institute | 2219 |
| Diesel & Gas Turbine Worldwide/Compressortech2 | 2047 |
| Empowering Pumps & Equipment | 1216 |
| Gas Compression Magazine | 2724 |
| Hydraulic Institute | 1321 |
| Palladian Publications | 1838 |
| POWERGEN International | 3005 |
| PTQ Magazine | 2701 |
| Turbomachinery International | 1813 |
| Vibration Institute | 1643 |
| | |

WEB BASED PUBLICATIONS

| AGMA – American Gear Manufactures Assoc. | 1501 |
|--|------|
| Diesel & Gas Turbine Worldwide/Compressortech2 | 2047 |
| Empowering Pumps & Equipment | 1216 |
| Gas Compression Magazine | 2724 |
| Palladian Publications | 1838 |
| PTQ Magazine | 2701 |

— TRAINING

TRAINING

| THE 52ND TURBOMACHINERY AND 3 | 9TH PUMP SYMPOSIA |
|--|-------------------|
| Mobius Institute North America | 2800 |
| Mitsubishi Heavy Industries | 2335 |
| MachVib Services Corporation | 2151 |
| lstec | 3037 |
| Hydraulic Institute | 1321 |
| HSI | 1739 |
| Bently Nevada | 1819 |
| Becht | 2547 |
| AGMA – American Gear Manufactures Assoc. | 1501 |
| Acoem | 3041 |
| | |

TRAINING

| REXA, Inc. | 1621 |
|--------------------------------------|------|
| Rotoflow, An Air Products Business | 2625 |
| SDT Ultrasound Solutions Inc | 3007 |
| SIFCO ASC | 2820 |
| Southern States Millwrights | 2601 |
| Spectra Quest, Inc | 2440 |
| TechStar | 2249 |
| Turbomachinery Lab Education Station | 1116 |
| Vibration Institute | 1643 |
| | |

TRAINING MATERIALS

| AGMA – American Gear Manufactures Assoc. | 1501 |
|--|------|
| Diesel & Gas Turbine Worldwide/Compressortech2 | 2047 |
| HSI | 1739 |
| Istec | 3037 |
| Mobius Institute North America | 2800 |
| Spectra Quest, Inc | 2440 |
| Turbomachinery Lab Education Station | 1116 |
| Vibration Institute | 1643 |

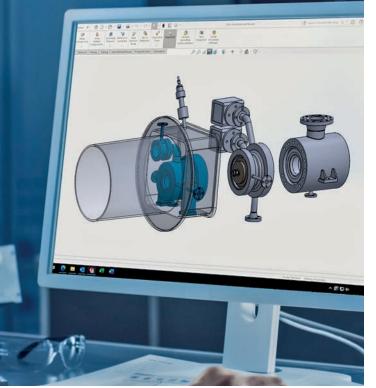
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OTHER

| Bass Tool & Supply, Inc | 1122 |
|--|------|
| Dongying Highyond Investment Casting Co., Ltd. | 1117 |
| Douglas Electrical Components | 2553 |
| EASA | 3035 |
| Gas Compression Magazine | 2724 |
| Gulf Coast Calibration | 1201 |
| POWERGEN International | 3005 |
| Sytek Electric | 1243 |

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VISIT THE TURBOMACHINERY LAB



RESEARCH AND EDUCATION

A variety of fundamental and applied research is performed by faculty, postdocs and students. This research is sponsored by a combination of government and industry sources through traditional grants and contracts and covers the entire range of specialties of the Turbomachinery Lab research groups. Research areas encompass rotordynamics and mechanical systems, thermal fluids and combustion, and computational modeling and design. Unique test rigs and extreme environments are among the many reasons why the Turbomachinery Lab continues to be a leader in turbomachinery, propulsion- and energy-related research.

Meet the Turbo Lab-hosted transportation in front of the Hilton at 12:15 pm Thursday after the conference closes. The Turbo Lab is located in College Station, Texas and you will return at 6:15 pm. You are welcome to drive yourself but you must be registered to attend. Visit the Info Booth for more information.



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The Turbomachinery Research Consortium (TRC) is an exclusive organization of major turbomachinery developers and users who have united with the Turbo Lab to find answers to important questions about turbomachinery performance and reliability through cutting-edge research.

EXPERTISE AT YOUR FINGERTIPS

TRC members have exclusive access to XLTRC2, a suite of high-speed, experimentally verified and user-friendly codes for executing a complete lateral and torsional rotordynamic analysis of rotating machinery, including pumps, compressors, and turbines. XLTRC2 is bundled with 25 or more examples of rotordynamic analysis, including rotors for compressors, pumps, and gas turbines. Each model features distinctive bearing/seal support conditions and displays unique characteristics of rotordynamic behavior.



FOR MORE INFORMATION, VISIT: TURBOLAB.TAMU.EDU/TRC

Eric Petersen, Director Debbie Maggs, Program Coordinator 979-845-7417 | trc@turbo-lab.tamu.edu





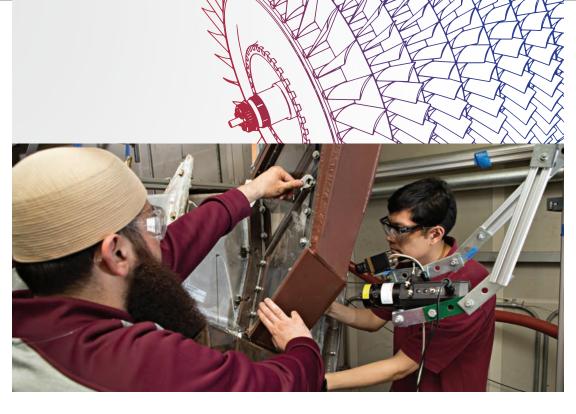




The Turbomachinery Laboratory, a center of the Texas A&M Engineering Experiment Station (TEES), conducts basic and applied research into important problems of reliability and performance of turbomachinery – rotating machinery that extracts or adds energy to fluids. That's everything from the classic Dutch windmill to the space shuttle's main engine turbopumps and compressors that move natural gas through the distribution system.

VISIT turbolab.tamu.edu

EMAIL info@turbo-lab.tamu.edu



The Turbo Lab, established in 1982, addresses the needs of users and manufacturers of turbomachinery and pumps. The Turbo Lab continues Texas A&M University's land-grant charter and tradition of attention to industry needs in three areas:

- Basic & Applied Research
- Undergraduate and Graduate Education
- Continuing Education & Professional Development

The Turbo Lab offers graduate engineering coursework through Texas A&M's College of Engineering, and provides continuing education opportunities to users of turbomachinery and pumps all over the world. Opportunities include short courses led by world-renowned researchers and original equipment manufacturers and users, as well as highly regarded symposia in Houston, Texas, and Southeast Asia.

The Turbo Lab also boasts a unique opportunity for turbomachinery developers and users to find answers to important questions about performance and reliability with the Turbomachinery Research Consortium (TRC) and answers about combustion and propulsion through the Energy and Propulsion Research Consortium (EPRC).

STAFF DIREC



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LABORATORY -



LAB MANAGER carljohnson@exchange. tamu.edu

ANNUAL ALUMNI NETWORKING MIXER

TUESDAY, SEPTEMBER 26TH

5:30 PM - 7:00 PM



WE HOPE TO SEE YOU THERE.

If you are interested in learning more about the Turbomachinery Lab Alumni association, contact Dr. Delgado or visit our website at turbolab.tamu.edu/ alumni.

BY INVITATION ONLY:

- A place for early engineers and alumni to network
- Appetizers and refreshments
- Updates from Dr. Delgado, the Alumni Assocation Coordinator

ABOUT THE MEMBERSHIP

Membership in the Turbo Lab Alumni Association is open to any individual in good standing who has been associated with the Turbo Lab for a minimum of one full academic semester as a student, faculty, or staff, and is approved for membership by the Turbo Lab director. Membership also is open to current students, faculty, and staff who have qualified for membership, and to TAMU graduates who have served on any Turbo Lab advisory committee.

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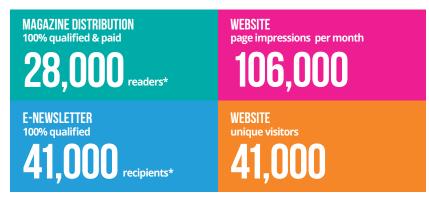






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GENERAL

EXHIBITION

In addition to our technical sessions, we encourage you to join us for our outstanding product show. Our exhibition will provide you the opportunity to engage with world-class technical personnel and view the latest in industry technology and full-sized equipment displays.

The exhibition for paid attendees will take place in Exhibition Halls C, D, and E. The halls will be open during the following times:

- Tuesday Noon - 2 P.M.
- Wednesday Noon - 2 P.M.

FREE PASS HOURS - EXHIBITION

Free Pass Registration required.

- Tuesday 2:30 P.M. - 7 P.M.
- Wednesday 2:30 P.M. - 6:30 P.M.
- Thursday 9:30 A.M. - Noon

WELCOME ADDRESS

The welcome address is scheduled for Tuesday, from 8 - 8:35 A.M. in the Grand Ballroom C, Level 3, George R. Brown Convention Center. Admission is free and open to the public.

LUNCHEONS

Badge required, not open to Free Pass

Lunch will be served on Tuesday and Wednesday in Exhibit Hall D. Admission is granted to paid attendees, exhibitors, and press. The one-day symposia registration fee includes admission to lunch for that day.

TEX-MEX BUFFET

Badge required, not open to Free Pass

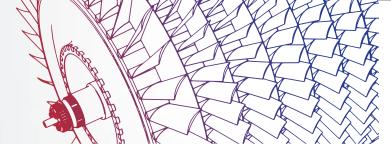
The Tex-Mex Buffet is scheduled for Tuesday, 7:30 PM - 9 P.M. in the Hilton Ballroom of the Americas A. Admissions is granted to paid attendees, exhibitors and press.

BANQUET

Badge required, not open to Free Pass

The Banquet is scheduled for Wednesday, 7:30 P.M. - 9 P.M. in the Hilton Ballroom of the Americas A. Admission is granted to paid attendess, exhibtors, and press.

Doors open at 7:15 P.M. No one admitted after 7:45 P.M.



GREENLINK BUSES

Free Transportation in Downtown Houston

Seven buses operate in Downtown Houston Monday - Friday, 6:30 A.M. to 6:30 P.M., about 7-10 minutes apart. The route spans 2.5 miles with 18 stops and connects Metro transit stops, the convention corridor, hotels, restaurants, shopping and entertainment.

Greenlink buses stop at popular downtown destinations including GreenStreet, George R. Brown Convention Center, Discovery Green, Main Street Square, City Hall and the Central Library and connects to Metro Park & Ride services and to the Main Street MetroRail line. The buses run on Compressor Natural Gas (CNG), making them a cleaner transportation alternative. Features of the buses include a streamlined, modern design, low-floor access, perimeter seating, high-quality air conditioning, 28-seat capacity, a front-mounted bike rack. Buses are ADA compliant.



SYMPOSIA PROCEEDINGS

The Turbomachinery Laboratory is proud to present the full technical program for this 52nd Turbomachinery and 39th Pump Symposium. These Proceedings are included as part of the full and one-day symposium registration fee. To access the Proceedings, see the QR code located on the flyer in your symposia bag, or visit the registration room for another copy.

CONTINUING EDUCATION

Units/profession development hours (CEU/PDH)

The CEU/PDH is the nationally recognized unit designed to provide a record of an individual's continuing education achievements. Symposia attendees earn .45 CEUs/4.5 PHDs Tuesday and Wednesday and .3 CEUs/3 PDHs Thursday or 1.2 CEUs/12 PDHs for full symposia. Short Course attendees can earn .6 CEUs/6 PDHs.

In order to receive a CEU/PDH certificate, you must complete and return the appropriate request form to the registration counter during the symposia or via email to the CEU coordinator, debbie@turbo-lab.tamu. edu. A certificate will be prepared and emailed to participants 4-6 weeks after the symposia.

NOTE: Registration is verified prior to issuing certificate.



COPYRIGHT INFORMATION

All technical sessions are protected by US copyright laws. Photography and video/ audio recording of any kind are strictly prohibited in the sessions and throughout the exhibition area, except for authorized press.

AMERICANS WITH DISABILITIES

ADA Amendments Act of 2008 (ADAAA).

The Texas A&M University System welcomes you to the Turbomachinery & International Pump Users Symposia. If you require an accomodation under the Americans with Disabilities Act (ADA), please contact Debbie Maggs at debbie@ turbo-lab.tamu.edu or (979)-862-7114 if you are an attendee, or Exhibitor Services at exhibit@turbo-lab.tamu.edu or 979-458-8878 if you are an exhibitor. Early notification is encouraged, and a request two weeks before the event you plan to attend will facilitate the provision of a reasonable accommodation.

CANCELLATION POLICY

Should symposia and/or short course cancellation be necessary, written refund requests (by fax or mail) must be received by the Turbomachinery Laboratory by midnight, August 18, 2023 for refund of registration fees. There will be a \$50.00 USD administrative and banking fee charge to cancel registration. Subsitutions are encouraged. We do request that substitutions be made in advance, as substitutions made onsite at the symposia will result in registration delays. Late cancellations (after the cancellation date) will be reviewed on a case-by-case basis for personal hardships (death, injury, or illness of the attendee or an immediate family member). Refunds may also be extended for natural disasters (hurricanes, etc.) and national emergencies (9/11, etc.)

The TL does not refund for business decisions (after cancellation date) by the attendee's employer such as: job reassignment, plant emergencies, etc. However, we encourage substituting another employee so the attendees' company receives the benefit of training. In the event of a "no-show" cancellation, short-course/Symposium materials will be forwarded to the absent attendee.

The State of Texas does not allow the TL to extend credit to individuals or companies. Therefore, we cannot apply registration fees for a missed course to another subsequent course. The TL reserves the right to cancel any short course or symposia and return all fees in the event of insufficient registration. We reserve the right to cancel due to unforeseen circumstances. The TL will not be responsible for any losses incurred by the registratins, including but not limited to airline cancellation charges or hotel deposits.



Becoming a member of the **COOLING TECHNOLOGY INSTITUTE**

CTI is a nonprofit self-governing technical association. It is dedicated to the improvement in technology, design, performance, and maintenance of evaporative heat transfer systems. In addition, water and air pollution has always been and will continue to be a prime concern to CTI and its members. CTI needs you to continue its energetic growth!

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Learn about water treatment and theory and get information on emerging technologies and development in waste disposal. Take part in the development of standards that govern your industry and join one of the many committees that work to exchange information, provide guidance, and disseminate technical expertise to membership. Interface with manufacturers, suppliers, owners/operators, consultants, and lifelong experts with one goal in mind: a united future for cooling technology.

Membership is available to corporate manufacturers, suppliers and their affiliates, corporate and individual owners/operators, consultants ranging from engineers to water treatment specialists, and students want to know more about the industry and its associated community.



For more information or for an application for membership, visit us online at CTI.ORG



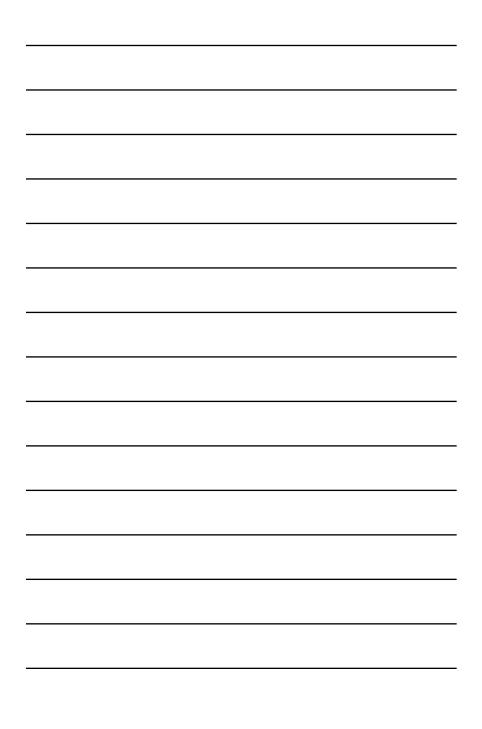


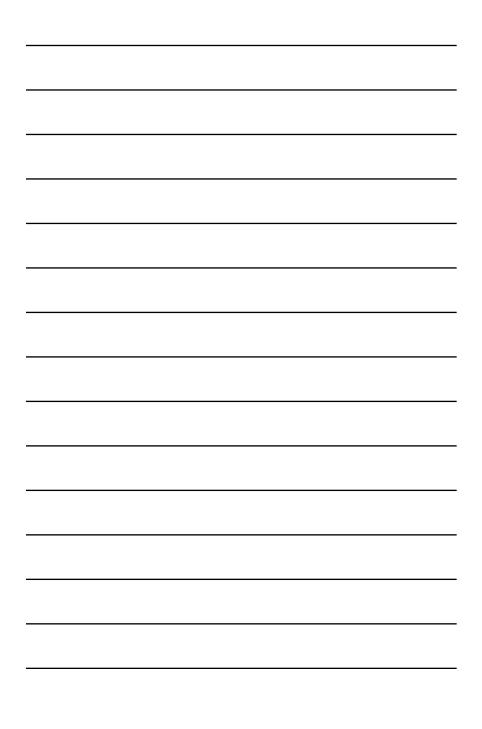
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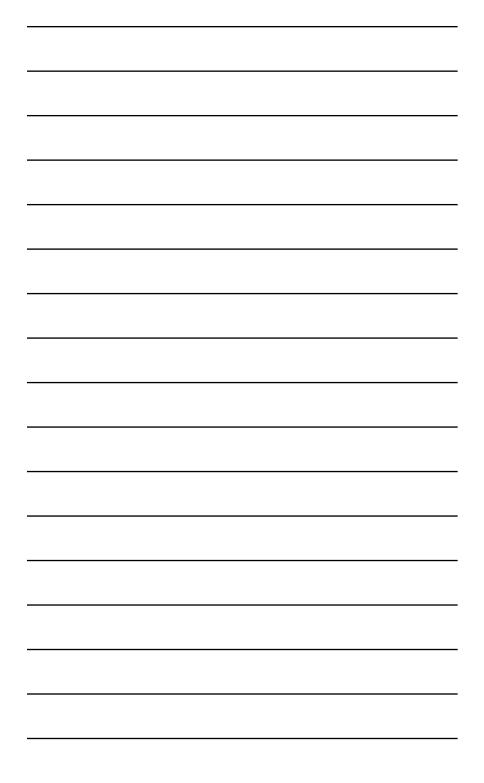
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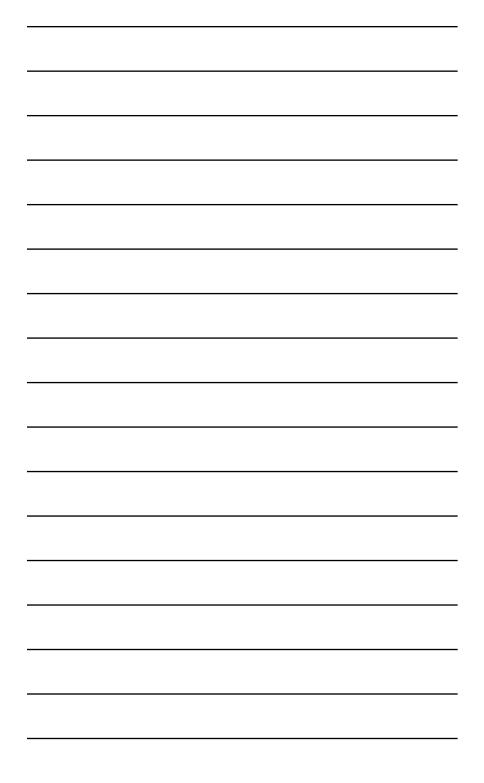














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