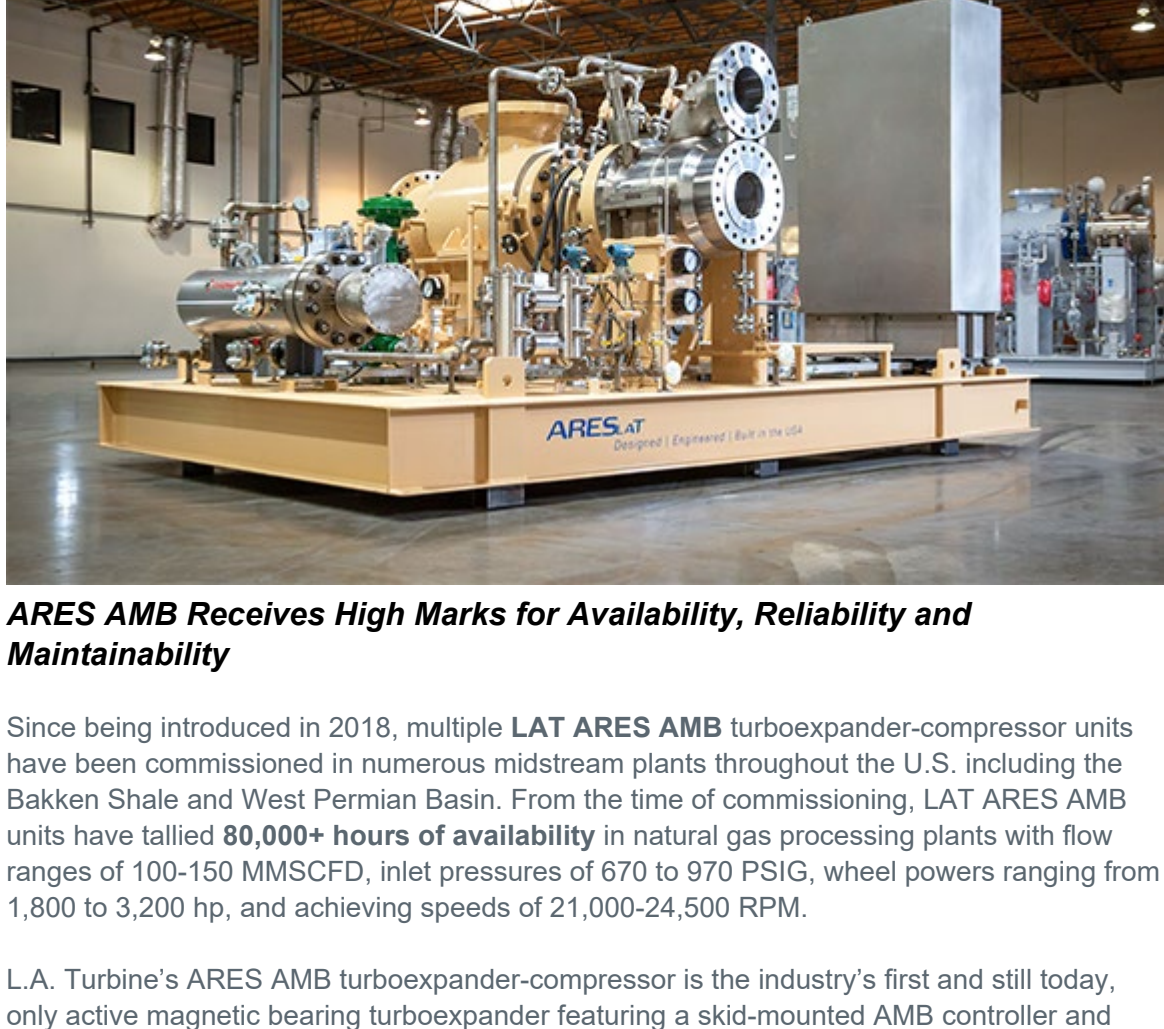


## ARES AMB Turboexpanders Log 80,000 Hours



### ARES AMB Receives High Marks for Availability, Reliability and Maintainability

Since being introduced in 2018, multiple LAT ARES AMB turboexpander-compressor units have been commissioned in numerous midstream plants throughout the U.S. including the Bakken Shale and West Permian Basin. From the time of commissioning, LAT ARES AMB units have tallied **80,000+ hours of availability** in natural gas processing plants with flow ranges of 100-150 MMSCFD, inlet pressures of 670 to 970 PSIG, wheel powers ranging from 1,800 to 3,200 hp, and achieving speeds of 21,000-24,500 RPM.

L.A. Turbine's ARES AMB turboexpander-compressor is the industry's first and still today, only active magnetic bearing turboexpander featuring a skid-mounted AMB controller and programmable logic control (PLC) panel, certified for hazardous area installation on the market.

### Why Do EPCs & End Users Choose an ARES AMB Turboexpander Configuration?

Gas processors realize immediate benefits from lower CAPEX, faster commissioning, decreased maintenance, more site layout options, temperature and performance flexibility, a smaller footprint, and a more environmentally-friendly machine.

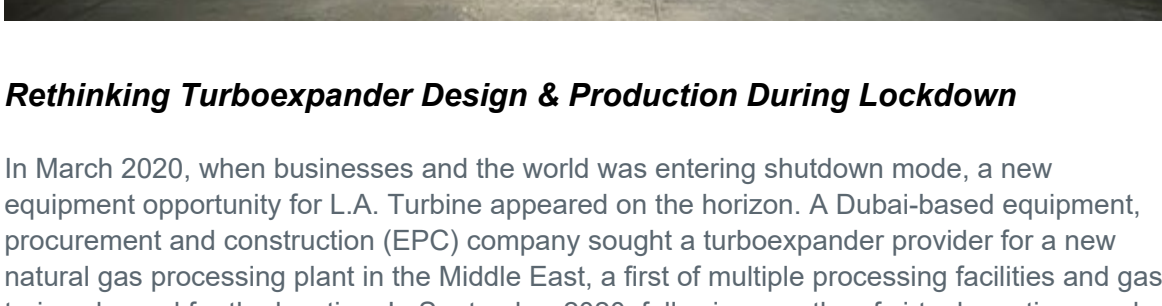
ARES AMB Benefits Summary	
<ul style="list-style-type: none"> <li>&gt; Pre-engineered &amp; tested solution</li> <li>&gt; Reduced CAPEX &amp; delivery time</li> <li>&gt; Small, modular footprint</li> <li>&gt; Easy install &amp; immediate operation</li> <li>&gt; Remote AMB commissioning &amp; monitoring</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Greater ambient temperature &amp; performance flexibility</li> <li>&gt; Minimized vendor coordination</li> <li>&gt; Less ongoing maintenance</li> <li>&gt; Lower energy consumption &amp; oil free</li> <li>&gt; U.S. manufactured in a vertically-integrated operation</li> </ul>

### Multiple Applications

The ARES AMB configuration is extremely well suited for midstream processors handling natural gas liquids, ethylene and propylene hydrocarbon flows of 60-300 MMSCFD. Industrial gas operators can also use an ARES AMB to process hydrogen, nitrogen, helium and perform air separation.

Interested in learning more about the ARES AMB turboexpander or LAT's compressor, generator and dyno-brake designs, [contact Troy O'Steen at Troy.O'Steen@LATurbine.com](mailto:Troy.O'Steen@LATurbine.com) or call +1 661 755 0949.

## LAT Delivers L4000 Turboexpander To Middle East

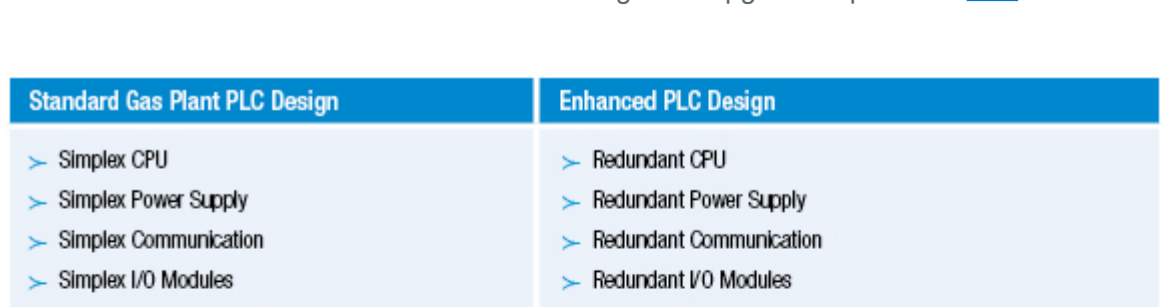


### Rethinking Turboexpander Design & Production During Lockdown

In March 2020, when businesses and the world was entering shutdown mode, a new equipment opportunity for L.A. Turbine appeared on the horizon. A Dubai-based equipment, procurement and construction (EPC) company sought a turboexpander provider for a new natural gas processing plant in the Middle East, a first of multiple processing facilities and gas trains planned for the location. In September 2020, following months of virtual meetings and around-the-clock negotiations, L.A. Turbine was awarded the oil-bearing turboexpander-compressor project.

Eighteen months later, in spite of the pandemic challenges, L.A. Turbine **announces the completion and shipment of the L4000 oil bearing turboexpander-compressor with remote programmable logic control (PLC) units** to the natural gas processing plant.

### PLC Cabinetry Delivers Significant Brainpower



This turboexpander skid package includes **one of the most complex PLC cabinets designed and built for natural gas processing** in L.A. Turbine's 19+ year history. The PLC features redundant CPU, power and communication capabilities, multiple safety measures and firewalls, and sophisticated monitoring capabilities. A comparison of standard PLC design features vs the L4000 turboexpander-compressor enhanced PLC design appears below. Learn more about L.A. Turbine's PLC design and upgrade capabilities [now](#).

Standard Gas Plant PLC Design	Enhanced PLC Design
<ul style="list-style-type: none"> <li>&gt; Simplex CPU</li> <li>&gt; Simplex Power Supply</li> <li>&gt; Simplex Communication</li> <li>&gt; Simplex I/O Modules</li> <li>&gt; Machine Monitoring via PLC</li> <li>&gt; Enclosure:               <ul style="list-style-type: none"> <li>– 36" W x 36" D x 12" H</li> <li>– 914mm W x 914mm D x 305mm H</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>&gt; Redundant CPU</li> <li>&gt; Redundant Power Supply</li> <li>&gt; Redundant Communication</li> <li>&gt; Redundant I/O Modules</li> <li>&gt; Safety SIL-2 PLC</li> <li>&gt; Intrinsically Safe Design with Isolation Barriers</li> <li>&gt; Surge Protection Barrier</li> <li>&gt; 3rd Party Machine Monitoring via B/N 3500 and B/N 3701</li> <li>&gt; HART Multiplexer</li> <li>&gt; Stratix Firewalls</li> <li>&gt; Three (3) Bay Freestanding Cabinets:               <ul style="list-style-type: none"> <li>– 94.4" W x 31.5" D x 78.74" H + 3.94" Plinth</li> <li>– 2400mm W x 800mm D x 2000mm H + 100mm Plinth</li> </ul> </li> </ul>

### LAT Shines in Face of Adversity

Amidst the COVID chaos, LAT engineers, shop machinists and assemblers accustomed to working side-by-side embarked on a first-of-a-kind distanced design, engineering and manufacturing process and overcame significant challenges to meet the contractual testing and delivery requirements. Not only are we *Rethinking Turboexpanders*, we also deliver innovative solutions in all we do.

Let L.A. Turbine's team of turboexpander experts create a solution for you! [Contact us now](#).

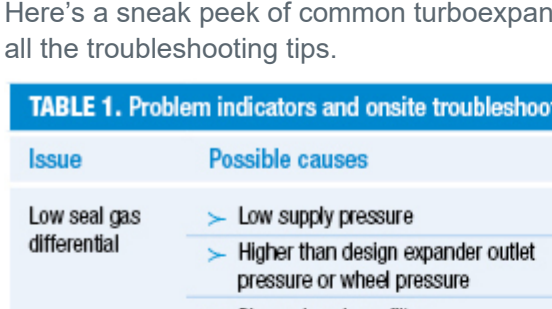
## A Turboexpander Trilogy: The Basics, Spin Class & Keep it Running

### L.A. Talks Engineers Share Their Expertise

When plant designers and end users understand what's inside the "black box" of a turboexpander and how it operates, the more successful they become when making critical decisions about their equipment. By being familiar with the contents of this trilogy of turboexpander articles, novice engineers and plant personnel will be better equipped to fulfill their roles while more experienced individuals will sharpen their knowledge.

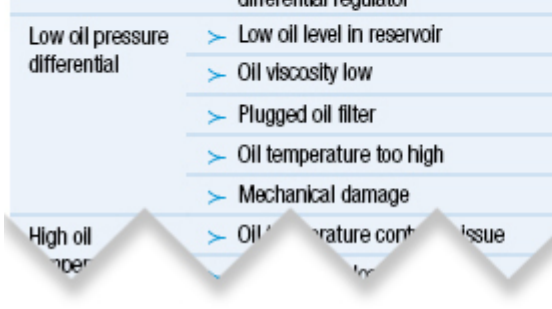
We hope you enjoy this trilogy thriller authored by LAT engineers and aftermarket service experts. Have questions about the series? [Send them our way](#)

### The Basics: Fundamentals of Turboexpander Design and Operation



[Learn the fundamentals](#) of cryogenic turboexpander design, special features, operations and while in service, how to maintain and troubleshoot issues from this comprehensive article written by engineers.

### Spin Class: Introduction to Oil Bearing Turboexpander Rotor Dynamics



If you are auditing the design of a turboexpander, what should you look for? [Learn](#) how rotor dynamics guide proper design, impact reliability and improve performance from a mechanical engineer's perspective.

### Keep it Running: Turboexpander Repair and Maintenance for Sustained Performance and Profitability



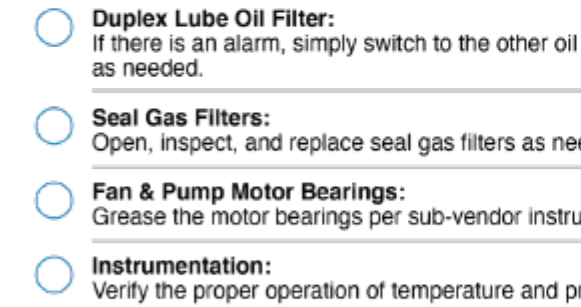
Did you know turboexpanders can be expected to perform as-designed for years without issue as long as some operational conditions are met? [Learn](#) how to sustain performance and impact plant profitability by knowing your cryogenic turboexpander. Access turboexpander troubleshooting causes and solutions and preventative maintenance tips now.

### Troubleshooting Tips: Causes & Solutions

Here's a sneak peek of common turboexpander problems, causes and solutions. [Click to see](#) all the troubleshooting tips.

TABLE 1. Problem indicators and onsite troubleshooting measures for turboexpanders		
Issue	Possible causes	Possible solutions
Low seal gas differential	> Low supply pressure	> Increase setting of supply regulator
	> Higher than design expander outlet pressure or wheel pressure	> Correct process conditions
	> Plugged seal gas filter	> Change filter element
Low oil pressure differential	> Defective or incorrectly set seal gas differential regulator	> Replace or rebuild the differential pressure regulator or adjust setpoint
	> Low oil level in reservoir	> Fill reservoir as required
	> Oil viscosity low	> Change oil with new charge and ascertain cause of dilution
High oil temperature	> Plugged oil filter	> Switch filters or replace with new element
	> Oil temperature too high	> Investigate malfunctioning oil cooler
	> Mechanical damage	> Intrusive investigation
High oil pressure	> Oil temperature control issue	> Check oil and viscosity
	> Oil pressure control issue	> Check oil and viscosity

## Perform Turboexpander Maintenance Now!



Spring is here. Now is the perfect time to **ensure your turboexpander-compressor is in tip-top shape** by performing preventative maintenance activities **with the help of the FX-TURBO Wellness Checklist** for oil bearing units shown below. Compiled by experienced turboexpander field service technicians, these **maintenance tips** apply to **any turboexpander brands** including L.A. Turbine, Rotoflow (Air Products, Atlas Copco and GE), Mafi-Trench (Atlas Copco), Cryostar, Texas Turbine and ACD Turboexpanders\*. Performing

preventative maintenance checks are easy and can be done by plant maintenance personnel.

**NOTE:** For those unsure on how to proceed, or if you have questions about your expander after performing checks, **LAT's FX-TURBO Team** offers consultative help via phone 24/7/365 at + 1 855 FX-TURBO (+1 855 398 8726). On-site service calls are also an option.

\*L.A. Turbine services its own products as well as competing brands. Any and all trademarks above are the property of their respective owners.

## L.A. Turbine's Website Moves!



### Same Address, New House

Our website address [www.LATurbine.com](http://www.LATurbine.com) remains the same yet we've upgraded to a new house. We are now a part of the **Chart Industries** site where you can find information on turboexpanders plus access a robust portfolio of clean energy solutions from the OneChart™ family.

### Seven Languages Spoken Here

You may also view the website in **seven languages** including Chinese, Czech, Spanish, French, German, Italian & English.

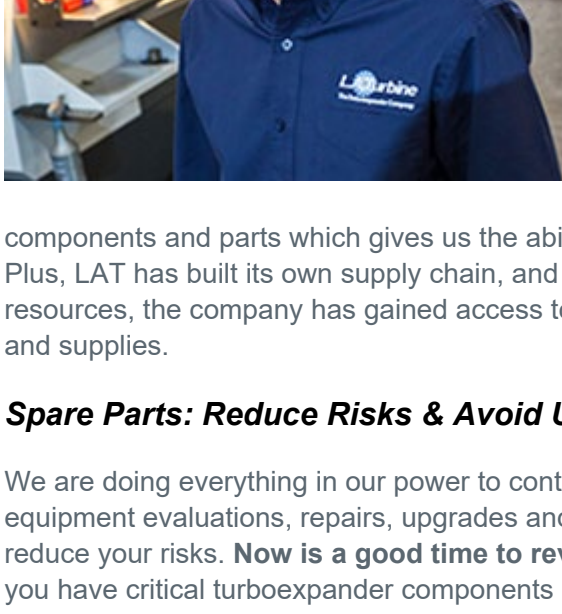
### Open House: Take a Quick Tour

You'll find **L.A. Turbine's company overview**, have quick access to our product and service offerings, and catch up on the latest news and events under the **L.A. Turbine Businesses** listing.

Interested in new **turboexpander designs** for natural gas, energy recovery or industrial gas applications? Check out our **Turboexpanders Products page** within **Heat Transfer Systems**.

Looking for info on LAT's **aftermarket repair and services**, regardless of the make or model, visit the **Repair, Service & Leasing** section and **Turboexpanders - Aftermarket Services** page.

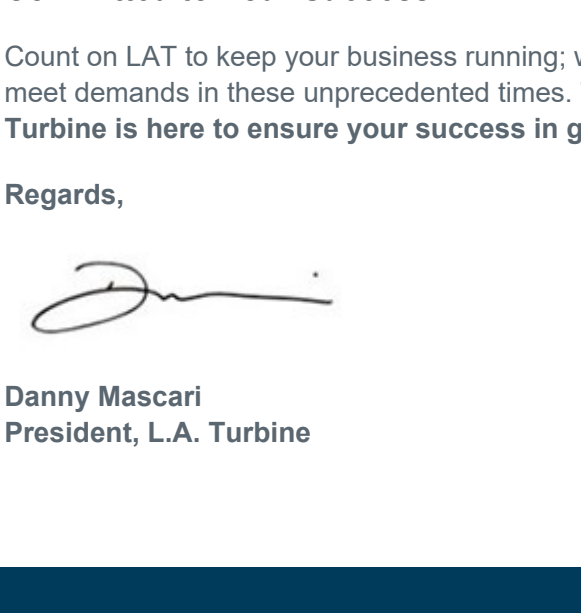
### Need Urgent Care? Emergency Services 24/7/365



**Need help?** Contact us anytime, any day from anywhere in the world by phone +1 855 FX-TURBO (+1 855 398 8726), email [sales@LATurbine.com](mailto:sales@LATurbine.com) or [service@LATurbine.com](mailto:sales@LATurbine.com), or select the **Contact Us** button on the website and a representative will be in touch.

Our turboexpander specialists are ready to repair your turboexpander or design the best unit for your application, flow and budget. **Contact L.A. Turbine today!**

## President's Letter



With energy demands surging, resources becoming scarcer, and supply chains faltering, steer clear of the unknowns. **Take control of the things you can control** like who you choose as a turboexpander OEM or aftermarket service provider.

Take proactive measures with **LAT's help to ensure plants can be built and turboexpanders are at optimum performance and availability**. As a vertically-integrated operation, L.A. Turbine is able to design, build, test and deliver both AMB and oil bearing turboexpander designs in record time. We are not dependent on third party suppliers for many key

components and parts which gives us the ability to move projects forward without interruption. Plus, LAT has built its own supply chain, and due to our alignment with Chart's global supply resources, the company has gained access to an extensive inventory of raw materials, parts and supplies.

### Spare Parts: Reduce Risks & Avoid Unnecessary Downtime

We are doing everything in our power to continue to provide you, our clients, with timely equipment evaluations, repairs, upgrades and manufacture of spare parts. You too can reduce your risks. **Now is a good time to review your spare parts inventory**. Make sure you have critical turboexpander components such as a spare mechanical center section (MCS), inlet guide vane (IGV) assembly, or seal gas or oil filters on hand.

### Perform Preventative Maintenance, Turnarounds or Switch Outs

Your turboexpander is the heart of your plant. This newsletter is full of tips to keep it running. If you haven't yet, take a minute to read, *Turboexpander Repair and Maintenance for Sustained Performance and Profitability*, from our turboexpander trilogy series. It contains proactive measures to take now to ensure machine availability & performance. And, if you need help or have questions, our **FX-TURBO Team** is ready to assist.

### Committed to Your Success

Count on LAT to keep your business running; we have the resources, expertise, and ability to meet demands in these unprecedented times. Take control of the things you can control. **L.A. Turbine is here to ensure your success in good times and bad.**

Regards,



Danny Mascari  
President, L.A. Turbine