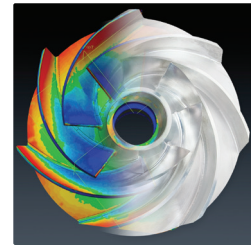
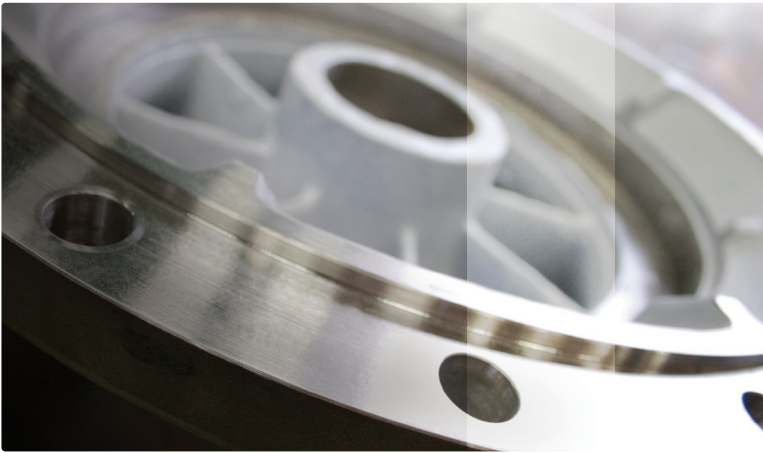
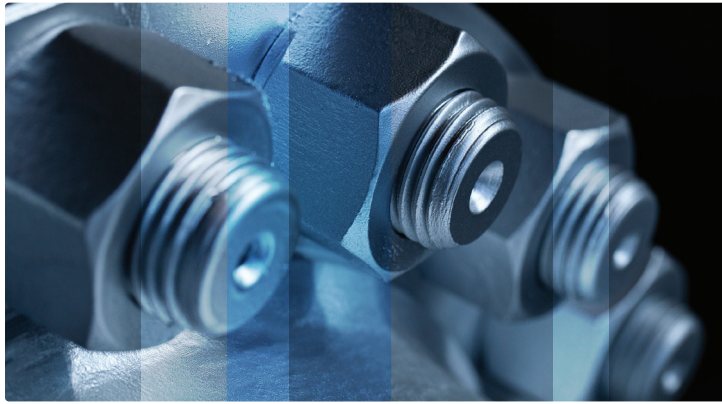


# HYDROTEX GOLDEN TRIANGLE



Engineering Pumps for Better Performance and Longer Life – Since 1969





## We Are Pump Experts

Engineering expertise is the foundation of our business. Our engineers and technical staff have extensive industry experience and are familiar with a broad range of pumping equipment. Utilizing the latest manufacturing and design technologies, we not only repair pumps- we improve them. With our broad knowledge-base and more than 50 years of proven successes, we are trusted by pump users around the world for better performance and longer life.

Our mission is to work hand-in-hand with our valued customers to optimize the performance and reliability of their pumping systems. We accomplish this goal by evaluating and understanding the root causes of pump degradation and by providing unbiased engineering analysis, quality workmanship, and responsive field service for improved plant operation.





## Worldwide Service Centers

24/7 Emergency Response

Field Service

Reliability Services

Quality Pump Repair

Engineering Services

Critical Parts Solutions

Certified Performance Testing

Condition Monitoring

Education & Training



Hydro provides engineering expertise and essential support to pump users around the world for better performance and longer life.



## HydroTex Golden Triangle – Powerful Capabilities

Hydro's 20,000 sq. ft. service center in Beaumont, Texas provides innovative and customized solutions for improving pump performance and reliability. As a rapid response center serving the oil and gas, chemical and petrochemical, and general industrial markets in the Gulf Coast region, the Golden Triangle service center prides itself on providing customers with paramount quality and customer service alongside a short turnaround time.

**We get it right – the first time.**





## Our State-of-the-Art Equipment Includes:

### CNC Machines:

- Mazak Quick Turn Nexus 350-II MY – 16" chuck
- Mazak Smooth Technology – Quick Turn 450MY – 21" chuck

### Vertical Boring Mills:

- 84" King Vertical Boring Mill, 72" under rail
- 36", 30" under rail
- 54", 40" under rail

### Lathes: 24" swing, 80" long

- 20" swing, 60" long
- 24" swing, 120" long
- 28" swing, 160" long
- 22" swing, 120" long

### Milling Machines:

- (2) 25" travel

### Horizontal Boring Mills:

- 4" G&L
- Table size 4'x8'

### Balance Machine:

- Up to 5,000 lbs, 36" diameter

### Welding:

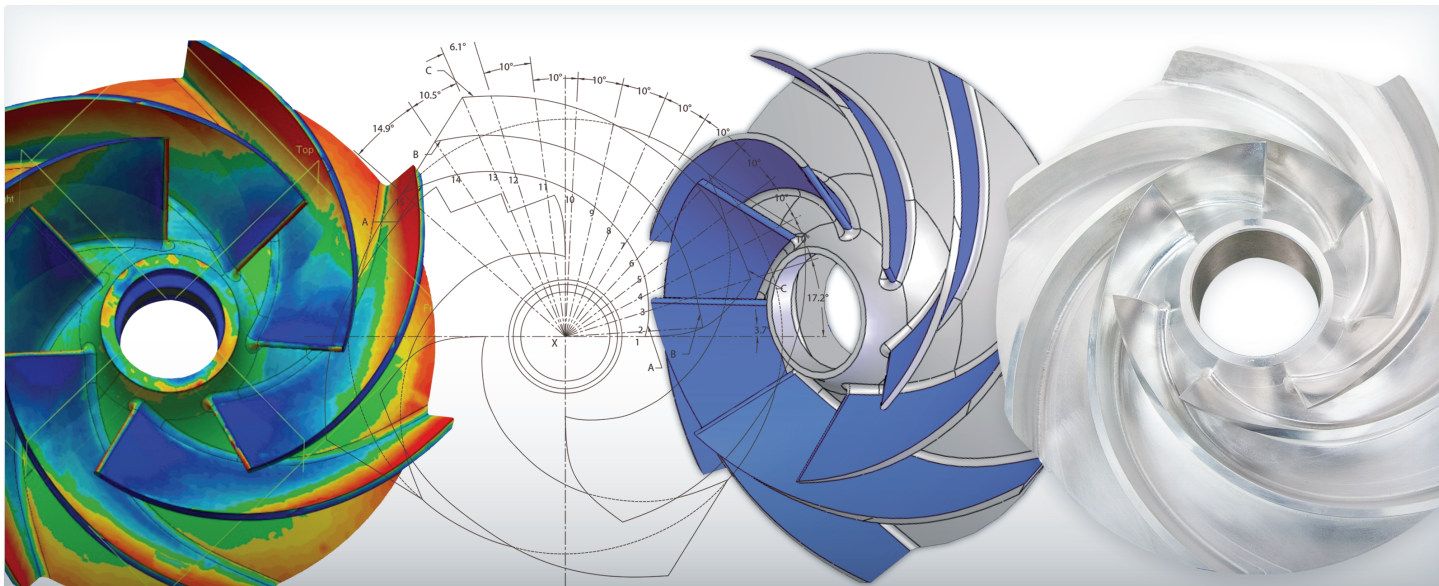
- GMAW & GTAW

### Overhead Cranes:

- 20 ton & (2) 10 ton

### Additional Equipment:

- On-site reverse engineering and CAD specialists equipped with Romer arm
- Belt & disc grinders
- Climate controlled shop



## Engineering Makes All the Difference

Engineering expertise is the foundation of our business.

Engineering review is a key element of Hydro's quality manufacturing process. Hydro's engineers have expertise in many fields and technologies- such as hydraulic design and computational fluid dynamics (CFD), vibration analysis, and metallurgy- that allows them to understand equipment failures and provide custom-engineered upgrades to improve reliability.

This network of experts is backed by a library of 50 years of accumulated knowledge in improving pumps, allowing them to fully comprehend the unique characteristics of each design and application. By using advanced technologies and applying their subject matter expertise, they can make recommendations for achieving optimal pump performance and longer life.

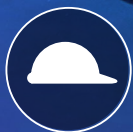
In addition to expertise in pump engineering, Hydro has developed an industry-leading expertise in reverse engineering and parts supply. HydroTex Golden Triangle is very fortunate to be closely connected with the Hydro Parts Solutions team. Hydro Parts Solutions provides high-quality cast parts with an expedited lead time. This is made possible by their extensive experience in reverse engineering, casting, and materials and the close relationships they have fostered with local Gulf Coast foundries.

It is Hydro Parts Solutions' pump-specific engineering knowledge, understanding, and experience that distinguish and define the reliability benefits they provide to their customers. Unified with Hydro's core values, Hydro Parts Solutions goes beyond simple part reproduction to provide recommendations for design and material improvements that can eliminate failures, reduce erosion and corrosion, and extend the expected life of the component.

Hydro Parts Solutions' process for providing cast parts may include:

- **Laser scanning and reverse engineering**
- **Solid modeling**
- **Hydraulic and metallurgical upgrades**
- **Solidification simulation**
- **Patternless casting/precision sand mold printing**
- **Customer-specified casting metals**
- **Certified performance testing to verify performance, when required**
- **Equivalency analysis of cast part to original scanned component**





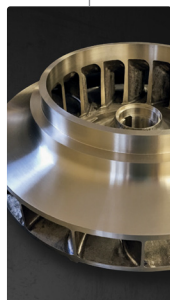
24/7 FIELD & EMERGENCY SERVICES



RELIABILITY SERVICES



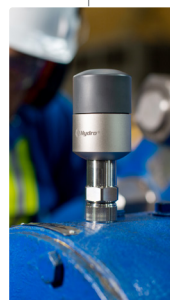
QUALITY REPAIR & ENGINEERING SERVICES



CRITICAL PARTS SOLUTIONS



CERTIFIED PERFORMANCE TESTING



CONDITION MONITORING



EDUCATION & TRAINING

# A Trusted Partner for Lasting Solutions

Optimized design saves energy, time, and money.

A major Gulf Coast refinery had several single-stage overhung process pumps that were unable to meet increased system process flow requirements. Concerns about lead times for new equipment, worsened by global supply chain difficulties, made replacement of these pumps a risky, and costly, proposition.

Fortunately, the team at HydroTex Golden Triangle was able to engineer a solution that significantly reduced both the risk of production delays and overall cost while still providing a reliable piece of equipment that successfully met the new performance requirements. Instead of providing an entirely new piece of equipment, the hydraulics of the existing pumps were modified to meet the target head and flow.

The first step in the rerate project was to reverse engineer the pump casing and impeller, which Hydro Parts Solutions completed in the field. They used the data captured during the reverse engineering process to create verified 3D models of the existing components. These models were provided to Hydro's Global Engineering division to perform the hydraulic redesign.



Hydro Global Engineering used their hydraulic design knowledge and computational fluid dynamics (CFD) expertise to redesign the casing volute and impeller so that they could achieve the required performance at an optimal efficiency. In contrast to “off-the-shelf” pump purchases, where an application engineer selects a model from an existing line close to the specified requirements, Hydro develops a custom-engineered design that meets the design operating point more exactly and efficiently. Because of this, the custom-engineered rerate Hydro provides not only reduces first cost, but provides sustainable maintenance and operations cost reduction through increased reliability, longer mean-time-between-repair (MTBR), and reduced energy usage.

After the redesign was complete, the new component specifications were sent to Hydro Parts Solutions to design the casting package, oversee casting of the parts at a local foundry, and provide the final machining. In parallel with the manufacture of the casing and impeller, the HydroTex Golden Triangle shop performed a refurbishment of the reusable pump components and brought the equipment into best-in-class tolerances. When the new parts were delivered, Golden Triangle completed the pump assembly.

The final step in the process was providing a certified performance test of the first rerated pump at Hydro's Performance Test Lab in Chicago. This test verified that the new design met the hydraulic and mechanical requirements of the site.

By leveraging their experience with complex pump repair and using the diverse resources of the Hydro global network, HydroTex Golden Triangle was able to provide the refinery with optimized performance at a fraction of the lead time and cost of purchasing a new piece of equipment.





# Pump Performance Testing – Smart and Fast

The highest standard of testing in a fraction of the time.

A faulty pump can cause downtime for the entire facility, costing thousands in maintenance and lost production. That's why Hydro designed and built a state-of-the-art test lab dedicated to the needs and requirements of the pump aftermarket. Because Hydro is independent, we can offer unbiased recommendations in every test situation.

Hydro's testing capabilities enable us to work with our customers to develop and implement engineering modifications that optimize the performance of critical pumps. The success of these hydraulic and mechanical upgrades are verified in the test lab and customers are provided with a new certified performance curve that shows how equipment will behave over the total operational range.

Because Hydro's test lab is dedicated to the aftermarket and not overrun with internal tests for new equipment, we have the flexibility to schedule tests that meet our customers' needs. We test day and night so that you get the highest standard of testing in a fraction of the time.

## Test Lab Key Features

**Designed in compliance with API 610 and Hydraulic Institute Standards**

**Capable of testing horizontal, vertical, and submersible pumps**

**Maximum of 5,000 HP**

**Variable Frequency Drive; 2,300 – 4,160 volts**

**Flows of up to 35,000 GPM on the horizontal loop and 42,000 GPM on the vertical loop**

**A state-of-the-art data collection system**

**Emergency testing in seven days**

**Certified by  
the Hydraulic Institute**

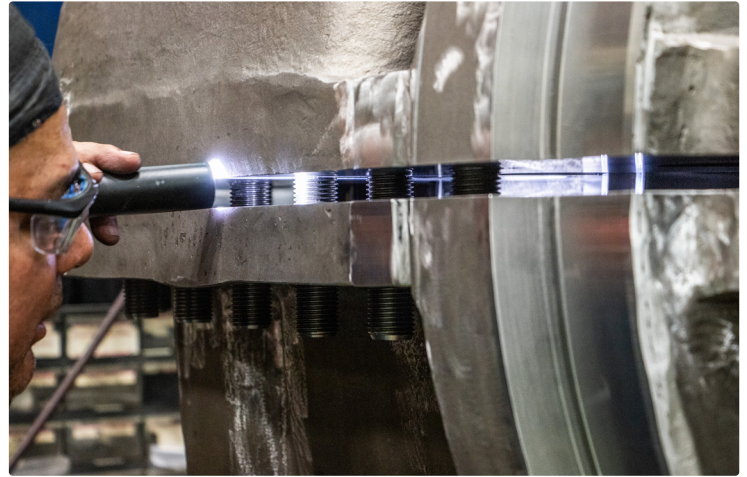


# A Dedication to Quality and Commitment to Excellence

Systems and processes – high standards for every step

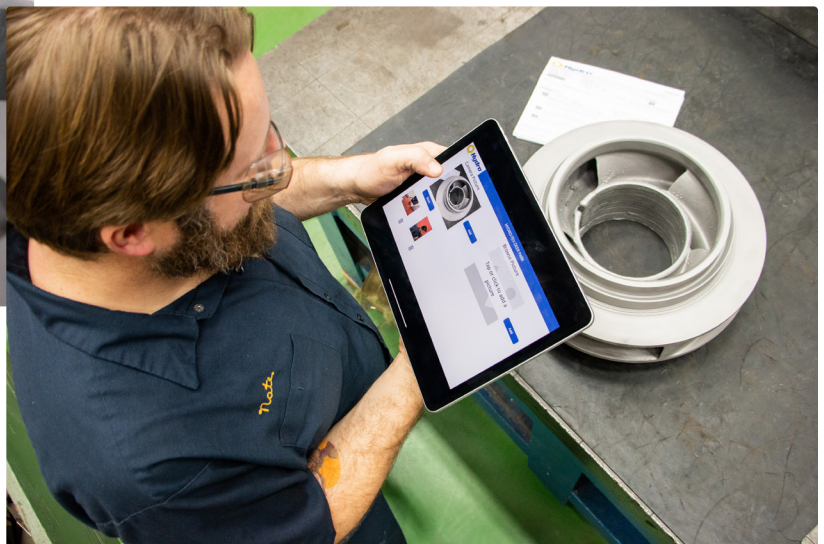
For over half a century, Hydro has worked closely with our valued customers around the world to provide industry-leading quality standards, customer-focused responsiveness, and unparalleled turnaround time.

Our global aftermarket service network provides customers with high-quality engineered solutions to complex problems. Implementing innovative solutions in an expedited time frame requires robust systems and processes to facilitate communication, documentation, and repeatability. Our 360° total support framework has been made achievable through decades of accumulated expertise and commitment to a rigorously developed and carefully implemented Enterprise Resource Planning (ERP) System.



Hydro's ERP System was specifically configured for the pump aftermarket and provides an integrated and continuously updated view of core business processes using network-wide databases. These databases allow us to share vital engineering data across our entire network of service centers and generate consistent, uniform parts lists for every pump that comes into one of our service centers. This visibility and uniformity in approach and documentation ensures consistent quality and faster turnaround time.

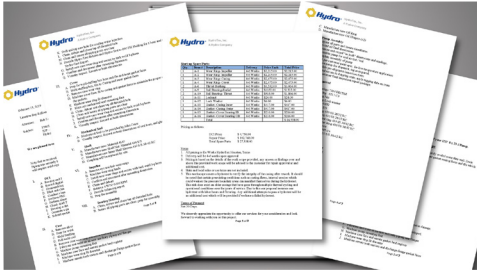
At the root of a quality job is a quality process. Our ERP system allows us to digitize every step of our workflow. From the initial inspection to final billing, every aspect of every project is turned into a data point that is available to our customers.



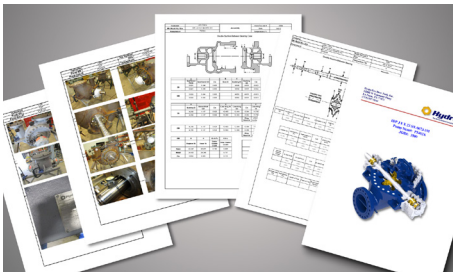




**As-Found Inspection Documentation** – As-found documentation provides high quality information and assets related to problem areas, damage, signs of degradation, and other issues observed during receipt inspection and non-destructive examination (NDE)



**Customer Data Management and Processes** –All aspects of the work scope are processed through Hydro's ERP systems. This enhances transparency, quality assurance, accountability, traceability, consistency, and 2-way communication during the repair process.



**As-Built Documentation** – When a unit is shipped, customers are provided with a full spectrum of post-repair documentation that highlights all aspects of the refurbishment, engineering drawings and assessments, and forensic analyses. Recommendations for further improvements, opportunities for optimized operation, and other support services available are also included in the document package.

Our ERP system continues to evolve- increasing in efficiency and streamlining scalability- to guarantee optimal turnaround times and leverage the resources available across Hydro's global network.

At Hydro, it's about more than quality, it's about our commitment to **consistent quality**. This commitment ensures that our customers are provided with a **superior product and optimized mean-time-between-repair for years to come.**



ATLANTA | BEAUMONT | CHICAGO | DEER PARK | DENVER | HOUSTON | LOS ANGELES | PHILADELPHIA  
AUSTRALIA | CANADA | CURAÇAO | ENGLAND | FRANCE | INDIA | KOREA | OMAN | UNITED ARAB EMIRATES | VIETNAM



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