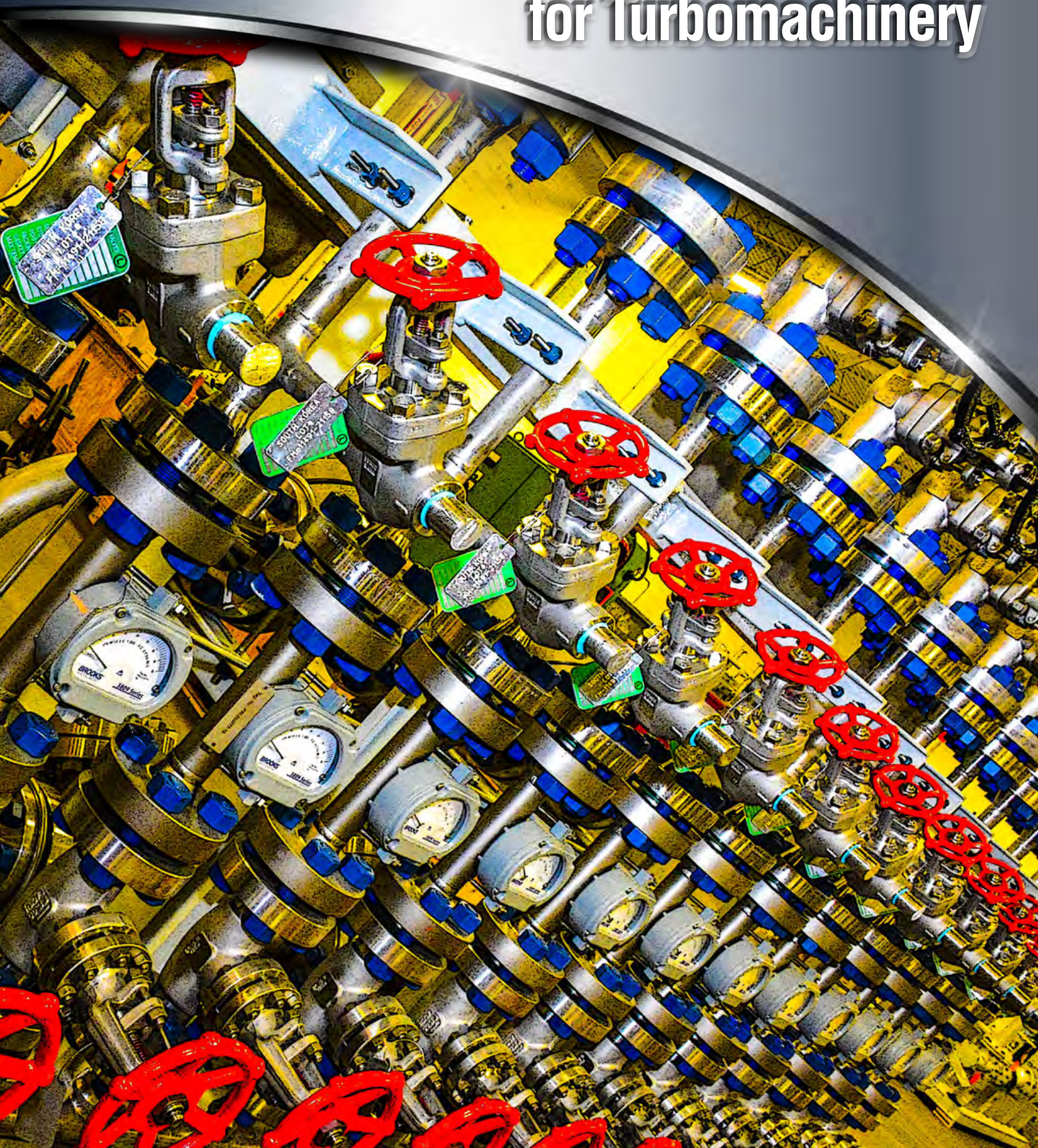


# Lubrication, Seal and Piping Systems for Turbomachinery





## ■ PACKAGING SOLUTIONS FOR TURBOMACHINERY

Elliott Packaging Solutions is a global leader in the design, manufacture and packaging of lubrication, sealing, and fueling systems for turbomachinery. Our dedicated team of experienced designers, fabricators, welders and service personnel produce and install packaged systems engineered to meet customers' precise needs. We routinely fabricate high-specification piping systems such as gas turbine fuel forwarding manifold assemblies, integrated lube and seal oil systems, dry gas seal and buffer gas seal packages, and steam turbine generator sets. We also provide accessory skids for water wash, fire suppression, de-NOx and water injection.

Elliott first began to manufacture oil consoles for its own turbomachinery nearly 80 years ago. The quality and reliability that Elliott engineered into those systems soon led other equipment manufacturers to specify Elliott systems and packaging for their own apparatus. The continued success of Elliott's lubrication, control and sealing consoles led to the formation of Elliott Packaging Solutions. Located in a new, state-of-the-art facility in Belle Vernon, Pennsylvania, Packaging Solutions is dedicated to providing the highest quality systems to OEMs in the U.S. and international markets.



## ■ ENGINEERING

Sound engineering designs start with experience and “know-how.” We are experts in rotating equipment as well as reciprocating platforms. Our willingness and ability to solve the toughest specification challenges set us apart from our competitors. Our highly experienced design engineers work as a team, delivering designs that incorporate the diversity of their collective knowledge. We arrive at effective solutions quickly and efficiently through the use of the latest design and 3-D modeling software along with our proprietary design tools. And we are responsive, flexible and easy to work with.



## ■ PROJECT MANAGEMENT

Your system will ship on time. On time delivery of a quality product is more than just words, it is our commitment. Each project is assigned a project manager to make sure that it stays on schedule and to provide a single point of contact for the customer, night or day. We manage every aspect of your project – design, materials certifications, fabrication and assembly, non-destructive testing and final inspection. Excellent service is our differentiator.



## ■ PIPING ASSEMBLIES & SPOOLS

We fabricate piping assemblies and spool pieces in our shop using precision welding equipment. We employ automated cutting, beveling and orbital welding equipment to maximize productivity. Our welding procedures comply with ASME B31.1 as well as B31.3 on a wide range of materials including chrome-moly, carbon steel, stainless steel, titanium, P91, inconel and hastalloy.





## ■ QUALITY

Our quality systems start with our highly trained and motivated staff, who are guided by documented and tested ISO 9001 procedures. The procedures are continuously reviewed and updated based on real-time data from our test stand, technology enhancements and, most importantly feedback, from our customers.



## ■ PACKAGING

Effective, efficient system packages begin with a thorough understanding of the site specifications, from the pad to the placement of the man-machine interface panels. Our packages are engineered and manufactured with the needs of the end-user in mind. We are able to reduce both installation and maintenance costs by consolidating the equipment footprint, minimizing on-site alignment, and tightly integrating all connections. To ensure reliable performance, we laser align every coupling. Elliott delivers the most flexible and value-oriented systems in the marketplace.



## ■ TESTING & DATA ACQUISITION

A Dataq data acquisition system managed through our ISO 9001 quality program simplifies testing our systems to API specifications. The Dataq system provides 32 flexible I/O ports that can be expanded to 64 I/O ports if needed. We can test 50 Hz and 60 Hz systems. All test data is catalogued and stored in our Product Lifecycle Management (PLM) database to ensure that the most current documentation is available to our customers.



## ■ PRE-ENGINEERED SOLUTIONS

We offer the industry's largest set of standard, pre-engineered API 614 Special Purpose (Chapter 2) systems. With flow rates from 9 GPM to 330 GPM, these designs are durable and optimized for compactness. They can be adapted to meet the needs of your application with minimal engineering, and a wide range of options and accessories are available.





## INTERNATIONAL STANDARDS

Elliott Packaging Solutions designs and delivers systems in compliance with all of the following international standards.

API Std 614 - ISO 10438	Special Purpose Oil & Gas Support Systems
API Std 610 - ISO13709	Centrifugal Pumps
API Std 611, 612	Steam Turbines
API Std 613	Special Purpose Gears
API Std 676	Positive Displacement Pumps
ASME B16.5, ANC, SAE	Pipe Flanges and Fittings
ASME B31.1, B31.3	Chemical Plant and Petroleum Refinery Piping
ASME CRN, PED, CELO, ASME Code, Section VIII, Division 1, NR13	Pressure Vessels
ASME Section IX	Welding and Brazing
TEMA, API 660, 661	Tubular Heat Exchangers
NEMA, NEC, CSA, ATEX, IEC, INMETRO	Electrical
API Std 617, Std 618 - ISO 13707, API Std 619	Compressors (Centrifugal, Reciprocating, Screw)

## ON-SITE SERVICE & RERATE STUDIES

Elliott's Global Service organization offers unparalleled service for any of our packaged solutions, around the clock, anywhere in the world. In addition, we offer on-site rerate studies to help you optimize the performance of your systems and extend the life of your critical turbomachinery. There are many potential benefits to an audit by an experienced Elliott rerate engineer:

- ◆ Troubleshoot costly operation problems
- ◆ Improve system performance and reliability
- ◆ Ensure system is operating at design conditions
- ◆ Identify requirements for upgrade to current standards
- ◆ Determine if system is suitable for a main equipment upgrade
- ◆ Integrate into a more comprehensive facility upgrade study



### *Manufacturing Facility & Capabilities*

- ♦139,000 square feet of production area
- ♦Two 35-ton cranes: 70-ton total capacity, 28'3" hook height
- ♦Two 5-ton cranes: 10-ton total capacity, 31'1" hook height
- ♦Four 2-ton jib cranes
- ♦AC motors up to 6000 volts
- ♦50/60 Hz variable speed drives
- ♦Vibration measurement and analysis
- ♦Electronic PID controllers for testing
- ♦Data acquisition with strip chart readout
- ♦Semi-automatic pipe weld machines
- ♦Welding processes:- Sub Arc, Stick, TIG, MIG, Pulsed, Microplasma, Spot
- ♦Post-weld heat treatment
- ♦Non-destructive testing: PMI, X-ray, Dye Penetrant, Magnetic Particle, Ultrasonic
- ♦Paint Booth
- ♦Blast Booth
- ♦Steam Clean Booth

### *Packaging*

- ♦Compressor systems
- ♦Integral lube systems
- ♦Steam turbine generator sets
- ♦Cooling systems
- ♦Gas engine
- ♦Blowers
- ♦Pumps

### *Applications*

- ♦Lube oil
- ♦Control oil
- ♦Seal oil
- ♦Fuel gas and fuel oil manifolds
- ♦Purge air systems
- ♦Dry gas and buffer gas seal support systems
- ♦Accumulators and draining packages
- ♦Interconnecting process piping
- ♦Filtration
- ♦Cooling
- ♦Gas conditioning
- ♦De-NOx/Ammonia injection grid (AIG)
- ♦Water injection
- ♦Water wash
- ♦Fire suppression

### *Industries*

- ♦Power generation
- ♦Oil & gas
- ♦Air separation
- ♦Pipeline
- ♦Steel
- ♦Chemical
- ♦Nuclear





Elliott Group is a global leader in the design, manufacture, and service of technically advanced centrifugal compressors, steam turbines, power recovery expanders, cryogenic pumps and expanders, and axial compressors used in the petrochemical, refining, oil & gas, liquefied gas, and process industries, as well as in power applications.

Elliott Group is a wholly owned subsidiary of Ebara Corporation, a major industrial conglomerate headquartered in Tokyo, Japan.



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T H E W O R L D T U R N S T O E L L I O T T



C O M P R E S S O R S ■ T U R B I N E S ■ C R Y O D Y N A M I C S ■ G L O B A L S E R V I C E