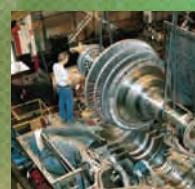
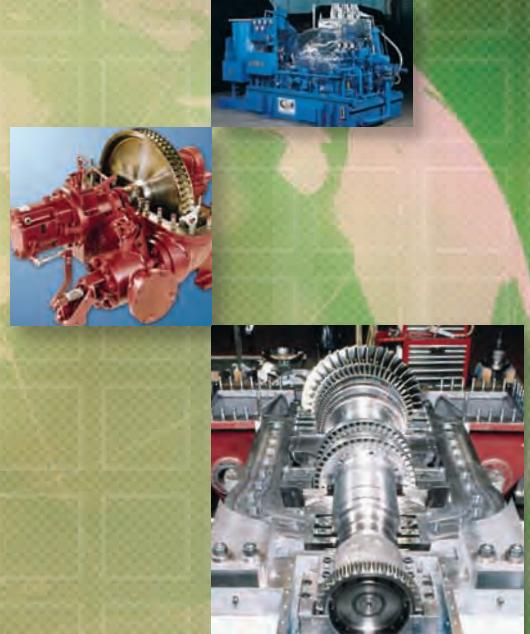




Mapex, LLC  
6000 Metrowest Blvd.,  
Suite 208  
Orlando , FL 32835 USA  
Tel: 407.472.1890  
Fax: 407.472.1896  
[mapex@mapexusa.com](mailto:mapex@mapexusa.com)

## STEAM TURBINE SOLUTIONS

STEAM TURBINE SOLUTIONS

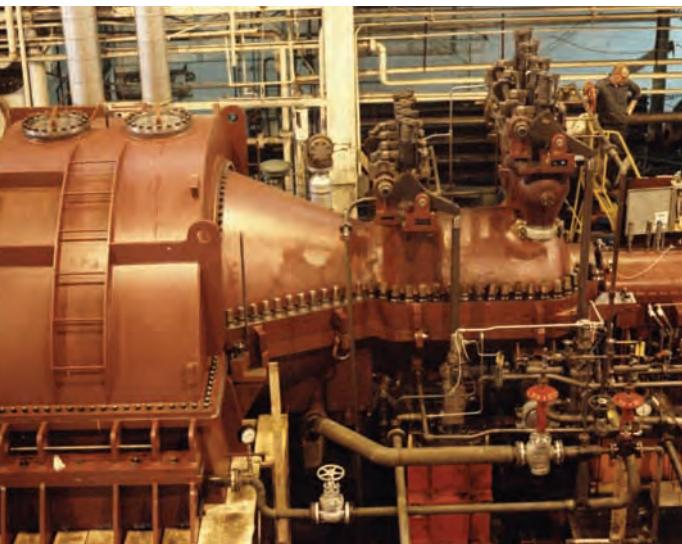


**DRESSER-RAND®**

Bringing energy and the environment into harmony.™

# S team turbine solutions

***Delivering steam turbines for power generation and mechanical drives for applications up to 100 MW.***



A 55 MW steam turbine used for electrical power generation in Watertown, New York.



## BUILDING ON A HERITAGE OF INNOVATION

Dresser-Rand® is a world leader in designing, manufacturing and servicing steam turbines, with more than a century of experience providing innovative rotating equipment solutions. D-R offers the most comprehensive steam turbine selection in the industry, backed by a worldwide network of sales, manufacturing and service support for all Dresser-Rand legacy steam turbines such as Moore, Murray, Nadrowski, Peter Brotherhood, Terry, Turbodyne, Worthington, COPPUS, and Dresser-Rand.

With approximately 62,000 steam turbine installations in more than 140 countries, our turbine knowledge is

unparalleled. Our heritage, along with our constantly evolving approach to turbine design, meticulous attention to detail, and unparalleled manufacturing, allows us to deliver reliable steam turbines for power generation and mechanical drives.

We manufacture our steam turbines at ISO-certified, state-of-the-art facilities in Burlington, Iowa; Wellsville, New York; Le Havre, France; Peterborough, UK; Oberhausen and Bielefeld, Germany. Our global presence—including 12 manufacturing facilities and 34 service centers—allows Dresser-Rand to provide flexible, responsive service.



The legacies of more than a dozen great companies create today's Dresser-Rand—a world leader in energy conversion solutions.



# S ingle-stage steam turbines

Dresser-Rand meets your process demands reliably and efficiently.

Dresser-Rand single-stage steam turbines have been a fixture in most process industries for nearly a century, providing clients with economical and reliable mechanical drives for water and oil pumps, fans, compressors and generators. For many years our engineering staff has worked closely with the oil and gas industry to meet the strict standards of API 611 and 612. D-R sales offices, located around the world, are staffed with experienced professionals. They can help you select the right single-stage steam turbine from more than 12 models, and an array of frame sizes and design options to meet your steam conditions and application requirements up to 5,500 HP.

## INDUSTRIES SERVED

- Oil and gas
- Food processing
- Chemical processing
- Pharmaceutical
- Steel
- Paper
- Sugar
- Palm oil
- Marine

## APPLICATIONS

- Pump drives
- Fan drives
- Mill drives
- Generator drives
- Compressor drives



## POWER CAPABILITIES

- 1 HP (0.75 kW) to 5,500 HP (4,100 kW)
- Up to 15,000 RPM
- Temperatures to 1,000°F (538°C)
- Pressures to 2,000 psig (138 bar)

## DESIGN CAPABILITIES

- 12 models
- Horizontal (axial and radial split)
- Vertical
- Mechanical safety trip system
- API 611- and 612-compliant
- Overhung and between-the-bearings wheel designs
- Inpro® seals
- Electronic governors
- Customized steam path components
- Multiple inlet control valves
- Direct-drive or integrally geared



## Restored Classic Single-Stage Steam Turbines

Through our large inventory and network of previously owned single-stage steam turbines, Dresser-Rand offers Restored Classics. A Restored Classic is a previously owned steam turbine, which D-R upgrades, completely reconditions and re-engineers to meet your needs. Not only are Restored Classics cost-effective and offer faster delivery times, they even come with the same warranties given to new units. In addition, the unit is tested to provide the safe and reliable service you'd expect from an original equipment manufacturer (OEM).

When you choose a Restored Classic single-stage steam turbine from Dresser-Rand, you're getting:

- A completely reconditioned turbine upgraded to D-R's OEM specifications and re-engineered for your application.
- Same as new, full, one-year warranty.
- A turbine with similar (if not identical) "footprint," inlet and exhaust orientations and sizes, and a shaft-end height that operates as a "drop-in" replacement whenever possible (to reduce costs associated with piping and foundation changes and save valuable turn-around installation time).
- A steam turbine that will maintain your valuable investment in replacement parts inventory and operating knowledge.
- The original design specifications, engineering drawings and service history records.
- A reprint of the original instruction manual revised for your conditions of service, including sectional drawings, a parts list, and the inspection and repair reports; only Dresser-Rand—as the OEM—can supply this valuable, proprietary information to you.
- A detailed engineering evaluation, including a complete review of blading and rotor reliability, turbine efficiency and mechanical design limitation.

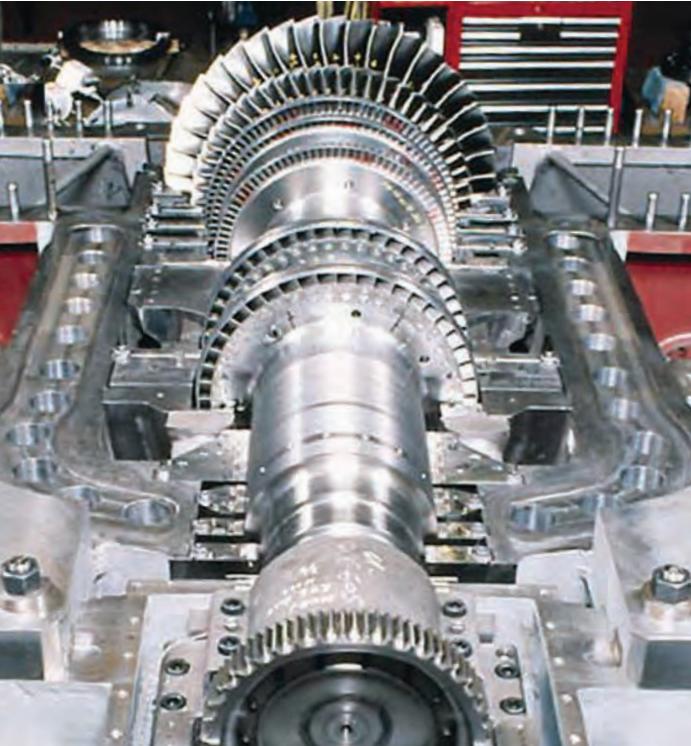
For more information and to check the availability of Dresser-Rand's Restored Classics single-stage steam turbines, contact your local Dresser-Rand representative, call our engineered solutions group at +1 585-596-3100 (toll-free in the U.S.—800-828-2818) or visit our website at [www.dresser-rand.com](http://www.dresser-rand.com).



# M ulti-stage mechanical-drive steam turbines

Proven reliability and high efficiency make Dresser-Rand mechanical drive, multi-stage steam turbines vital partners with the process industries. High feedstock and energy conversion costs demand that steam turbine efficiency be as much a consideration as reliability.

Dresser-Rand's industrial multi-stage steam turbine line helps you meet a variety of energy requirements in industrial environments. These turbines operate at speeds up to 17,000 RPM, with steam inlet conditions up to 2,000 psig (138 bar), 1050°F (566°C), and exhaust conditions up to 800 psig (55 bar).



## INDUSTRIES SERVED

- Oil and gas
- Power
- Sugar
- Ethanol
- Paper
- Education (universities)
- Municipalities
- Medical
- Food and beverage processing
- Petrochemical

## MECHANICAL-DRIVE APPLICATIONS

- Compressors
- Chillers (air conditioning)
- Boiler feed water (and other) pumps
- Milling equipment
- Fans
- Blowers

## POWER CAPABILITIES

- From 670 HP (500 kW) up to 94,000 HP (70 MW)
- Inlet temperatures up to 1,050°F (566°C)
- Inlet pressures up to 2,000 psig (138 bar)
- Exhaust pressures from 0.5 HgA to 800 psig (55 bar)
- Up to 17,000 RPM

## DESIGN CAPABILITIES

- Single- and multi-valve inlet
- Controlled extraction
- Extraction/condensing
- Mixed pressure induction
- API 611 and 612 specifications
- Mechanical and electronic governors
- Remote monitoring controls





# S team turbine generator sets

**Custom-designed turbine generators engineered  
to meet specific requirements.**

Dresser-Rand offers a complete range of turbine generator (TG) sets for on-site power and distributed energy in sizes from 0.5 MW to 100 MW. Our reliable turbine generator sets feature rugged designs and produce power for pulp and paper, sugar, hydrocarbon and process industries, as well as universities and municipalities. Our steam turbines meet when required, applicable industry standards set forth by the American Petroleum Institute (API 611 and 612).

We furnish a complete turbine generator package, and work closely with our clients to meet their job-specific needs.

Our custom-designed turbine generators can be direct-drive or geared. Solutions include a variety of configurations—condensing or noncondensing, single- or multivalve, single- or double-automatic extraction, or mixed-pressure designs. Exhaust flanges can have an axial, side, upward, or downward orientation.

## INDUSTRIES & APPLICATIONS

- Food processing
- Paper mills
- Palm oil
- Sugar
- Universities
- Medical centers
- Marine
- FPSO
- Biomass
- Ethanol
- Waste-to-energy

## POWER CAPABILITIES

- From 500 kW up to 100,000 kW
- Inlet temperatures to 1,050°F (566°C)
- Inlet pressures to 2,000 psig (138 bar)
- Exhaust pressures from 0.5 HgA to 800 psig (55 bar)

## SCOPE OF SUPPLY

- Single- or multi-stage steam turbines
- Base plate
- Reduction gear (if required)
- Lube oil systems
- Generator
- Control systems

## Biomass and Dresser-Rand

**Dresser-Rand installations can be found in virtually every industry that utilizes steam for process and/or power production. Among our wide range of clients, biomass installations have continued to increase in size and numbers.**

**Our large array of product offerings and many years of experience have made us a leader in the “biomass to biopower” industry around the world. These installations are primarily burning a variety of organic waste material to run TG sets of various sizes and configurations.**

**Some installations include:**

- **A lumber mill in the U.S. burning wood chips operating a 6 MW, controlled extraction TG set for on-site power and distributed energy.**
- **A U.S. horse farm burning animal waste running a 600 kW turbine generator for on-site power.**
- **Toxic waste-burning plant in Finland producing 6 MW of power for distributed energy and district heating applications.**
- **In southern Spain an olive oil processing plant operates two condensing TG sets. The 7 MW and 4 MW turbine generators at this combined cycle plant produce on-site power and distributed power during peak harvest season.**

**Dresser-Rand has worked successfully with OEMs, contractors, engineering companies and end users to complete hundreds of biomass projects. Please contact us for additional information and references.**

Dried olive oil residue fuel



Wood burning power plant



Power plant utilizing wood chips for fuel





## SERVICE THAT IS SECOND TO NONE

Dresser-Rand has many ways to help you get the most from your steam turbine investment by increasing its longevity, availability, safety, reliability, efficiency, and performance. Dresser-Rand offers a comprehensive range of services and solutions including parts, upgrades, revamps, reapplications, rerates, repairs, field services, controls and condition monitoring, and customized training. Our dedicated teams of professionals have the experience and vision to help you select the approach that maximizes equipment operation.

As an OEM, we have access to the original design specifications and understand the full implications of any changes, so that we can help maintain the integrity of your system. Dresser-Rand's state-of-the-art technology and total solutions capabilities can be applied to many makes and models of steam turbines.

## OEM REPLACEMENT PARTS

Dresser-Rand is a technology leader, committed to R&D. Our replacement and upgraded parts are designed for specific applications to maximize the reliability and availability of your rotating equipment assets. To minimize downtime associated with overhauls and turnarounds, packages and kits of consumable parts are readily available for use in standard maintenance procedures and repairs. In addition to custom stocking and "recommended spares" programs, we maintain a large inventory of replacement parts ready to ship on order.



.....  
Your assurance of quality parts.

## COMPONENT UPGRADES

D-R offers an extensive range of value-added, state-of-the-art upgrades and modernizations for most brands of rotating equipment. Our latest design, material and manufacturing improvements, our extensive engineering knowledge, testing capabilities and field operating experience provide you with improved components that maximize safety, reduce maintenance, increase reliability/availability, improve performance, extend equipment life, and reduce life cycle costs.

## OPERATIONS AND MAINTENANCE SERVICES

Dresser-Rand's *Availability PLUS®* "pay us for our performance" contracts maximize your profitability by providing increased reliability, availability and efficiency. The *Availability PLUS* program bundles all the resources within D-R into a comprehensive, value-added package with a single point of responsibility, regardless of nameplate. With D-R taking care of your equipment, you'll be better able to focus on your core business.

## ENGINEERING ANALYSIS

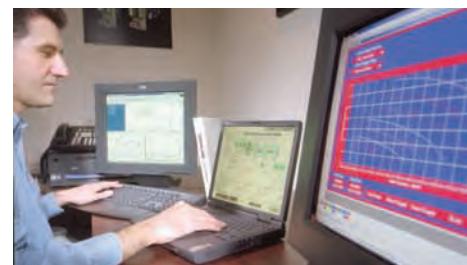
D-R's experienced engineers and technicians are available to visit your site to determine the physical condition and operating performance of your equipment, and recommend the best ways to improve its reliability, efficiency and operation. Our field service personnel have access to information that is simply not available to other field service providers; this includes original designs, historical data and other proprietary information that help us to recommend the most effective solutions.

## SERVICE CENTERS

Our dedicated staff is strategically located throughout the world for responsive, reliable support. Our service centers feature the latest technology and manufacturing skills to repair and rebuild your steam turbine.

## FIELD SOLUTIONS

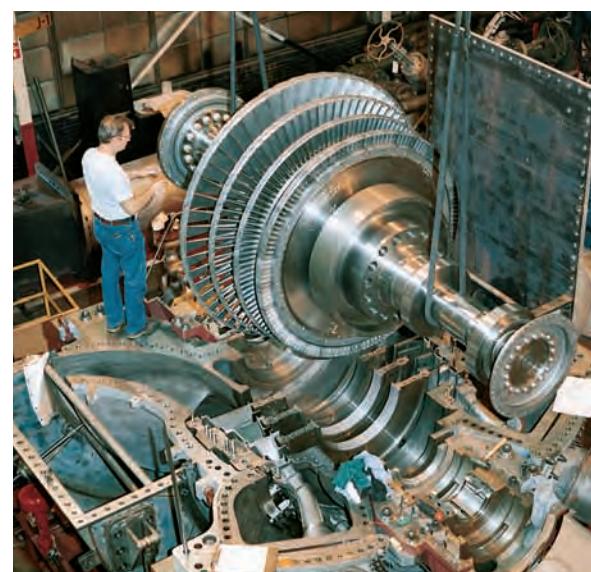
Dresser-Rand provides complete field installation, commissioning, maintenance, client training, and repair services for all rotating equipment and control systems. These services can extend to non-Dresser-Rand nameplate equipment as well. Our dedicated teams around the world can help you develop cost-effective, field-proven solutions for repairs, overhauls, upgrades, rerates, and virtually any other challenge. D-R's "on-site, on-time" pledge means we'll be there when you need us, 24 hours a day, 365 days a year.



## DRESSER-RAND CONTROL SYSTEMS AND REMOTE CONDITION MONITORING

Dresser-Rand provides custom-engineered control systems. Drawing from our unmatched rotating equipment experience, Dresser-Rand provides technologically advanced control systems that achieve new levels of reliability and operational efficiency.

Moreover, D-R standard systems are client-maintainable without significant investment. Our state-of-the-art PLC-based DI-Tronics™ control system can be configured to monitor and protect the entire turbine-compressor system. Manual and automatic start, unit warm-up and cool-down, local and remote control, gas turbine fuel control, compressor surge control, vibration and temperature monitoring, train sequencing and machinery protection are all integrated in the DI-Tronics system.



.....  
Field Services provides complete field maintenance, installation, training, and repair of all rotating equipment and control systems.

