

# Elliott Turbine Generator Sets

*Reliable, Economical Energy Solutions*



The world turns to Elliott

**TURBINES**

# Steam Turbine Generators from Elliott

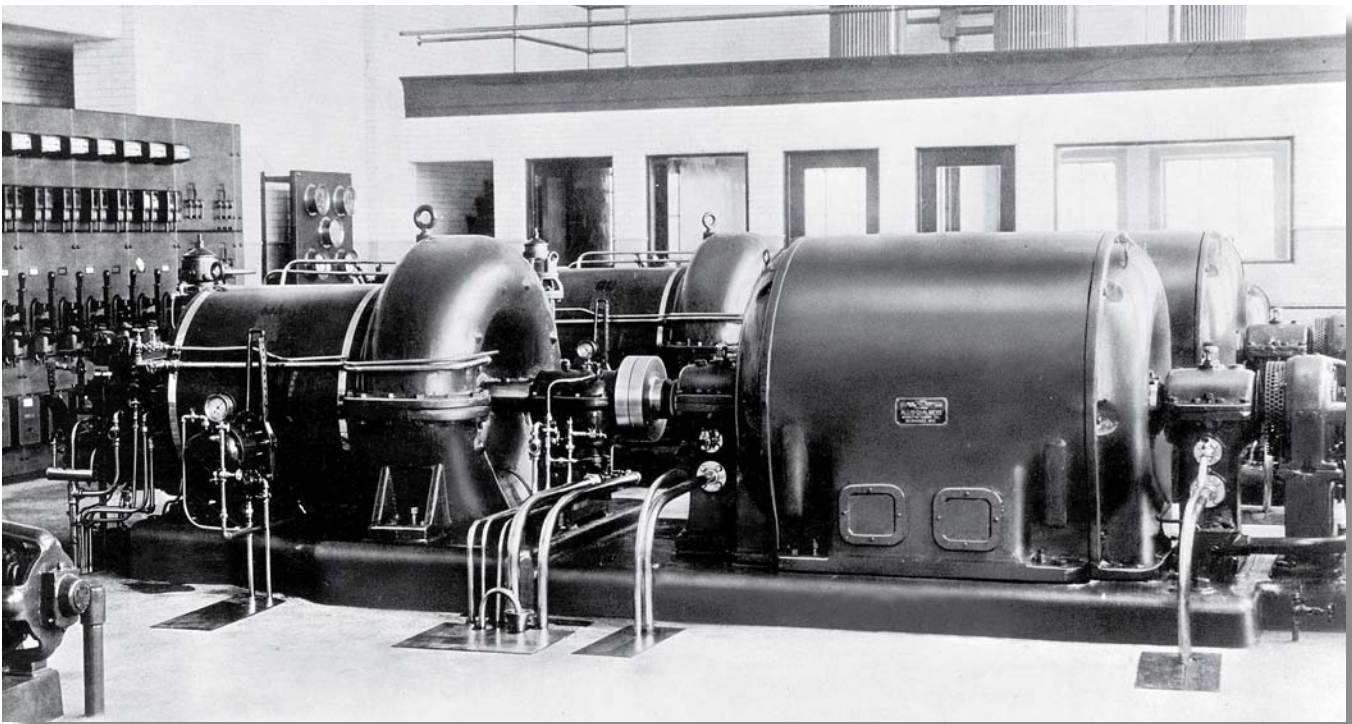
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Elliott steam turbine generator (STG) sets for power generation offer the features, functions and benefits required to support today's commercial energy requirements. Elliott STGs are available in a wide range of power offerings, from 50 kW to 50 MW and with synchronous and induction generator options. Elliott delivers complete design packages including the steam turbine, speed reducing gear, generator, lube system, controls, base plates, commissioning services, and operator and maintenance training. Elliott's STG design capabilities enable us to support most power generation needs, particularly renewable energy applications and the market's current green energy initiatives. With over 100 years of engineering experience, Elliott has the expertise to create an STG tailored to your specific requirements.

## Efficient, Reliable Power

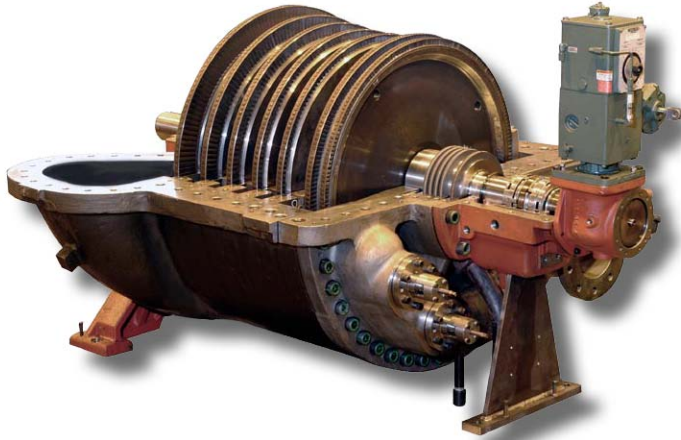
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The steam turbine generator concept is simple and time-tested. An Elliott STG is an efficient, cost-effective means of producing renewable, electric power from the excess thermal energy in a steam system or from an alternative fuel source such as biomass. Depending on local utility cost models, an Elliott STG configured to your specific requirements can provide payback on your initial capital expenditure in 3 years or less. An experienced Elliott sales representative will evaluate your particular energy and utility metrics and help you determine your potential payback.



## The Right Mix”

Cost-effective co-generation of electricity begins with “the right mix.” The right mix means first of all a generally predictable demand for steam. The second part of the mix is a generally constant electrical load or a Power Purchase Agreement. With alternating seasonal demand for heating and air conditioning and consistent staffing levels, many institutions such as universities, medical centers, correctional institutions and corporate campuses fit this profile.

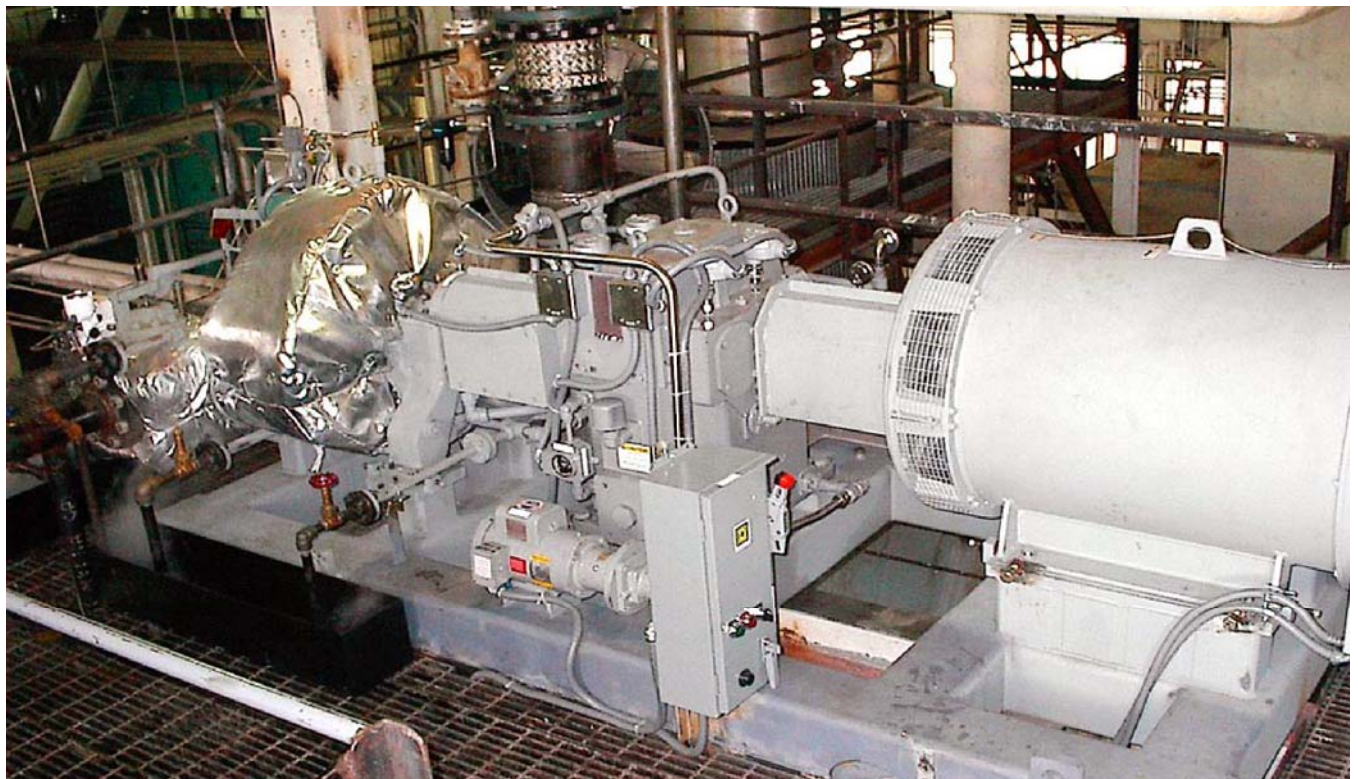


Elliott’s highly reliable, compact and efficient YR turbines are well-suited to geared, synchronous turbine generator applications. More than 35,000 YR turbines have been sold around the world. This single valve, multistage unit can produce up to 7000 kW.

The prevalent use of steam in industrial processes identifies those plants as excellent candidates for electrical co-generation. Steam pressures and quantities often exceed process requirements. With an Elliott STG, excess thermal energy can be cost-effectively converted into electricity rather than wasted. Industries such as lumber, sugar, and food processing burn waste material for low cost steam production. In these situations, an Elliott STG can pay for itself in less than one year.

Elliott STGs are integrated into many industrial applications including:

- ◆ Power
- ◆ Geothermal
- ◆ Chemical Processing
- ◆ Food & Beverage
- ◆ Industrial Manufacturing
- ◆ Refining
- ◆ Oil & Gas Processing
- ◆ Pulp, Paper & Wood
- ◆ Pharmaceutical & Biotech
- ◆ Alternative Fuels
- ◆ Municipal Waste to Energy
- ◆ Biomass
- ◆ Solar



## Power to Match Your Needs

Elliott's steam turbine generator configurations match a wide range of application and power requirements. Whether your need is for continuous or stand-by power, Elliott can provide a highly reliable, highly efficient solution ranging from 50 kW to 50 MW.

ELLIOTT TURBINE GENERATOR CONFIGURATIONS

TURBINE DESIGN		POWER RANGE	PRESSURE MAXIMUM	TEMPERATURE MAXIMUM
SVSS	Back pressure Condensing	50 kW - 2.6 MW	900 psig (63.3 kg/cm <sup>2</sup> )	900° F (482° C)
SVMS	Back pressure Condensing	1 MW - 8 MW	900 psig (63.3 kg/cm <sup>2</sup> )	900° F (482° C)
MVMS	Back pressure Condensing Extraction back pressure Extraction condensing	5 MW - 50 MW	2,000 psig (140.6 kg/cm <sup>2</sup> )	900° F (482° C)

## A Heritage of Quality & Reliability

Elliott has designed and manufactured steam turbines for 100 years, and tens of thousands of Elliott turbines are in operation today. Around the world and over the course of millions of hours of operation, Elliott turbines and STGs have earned a reputation for high reliability and efficiency. Elliott's product line includes single valve single stage (SVSS), single valve multistage (SVMS) and multivalve multistage (MVMS) turbines.



# Fully Integrated Control Systems

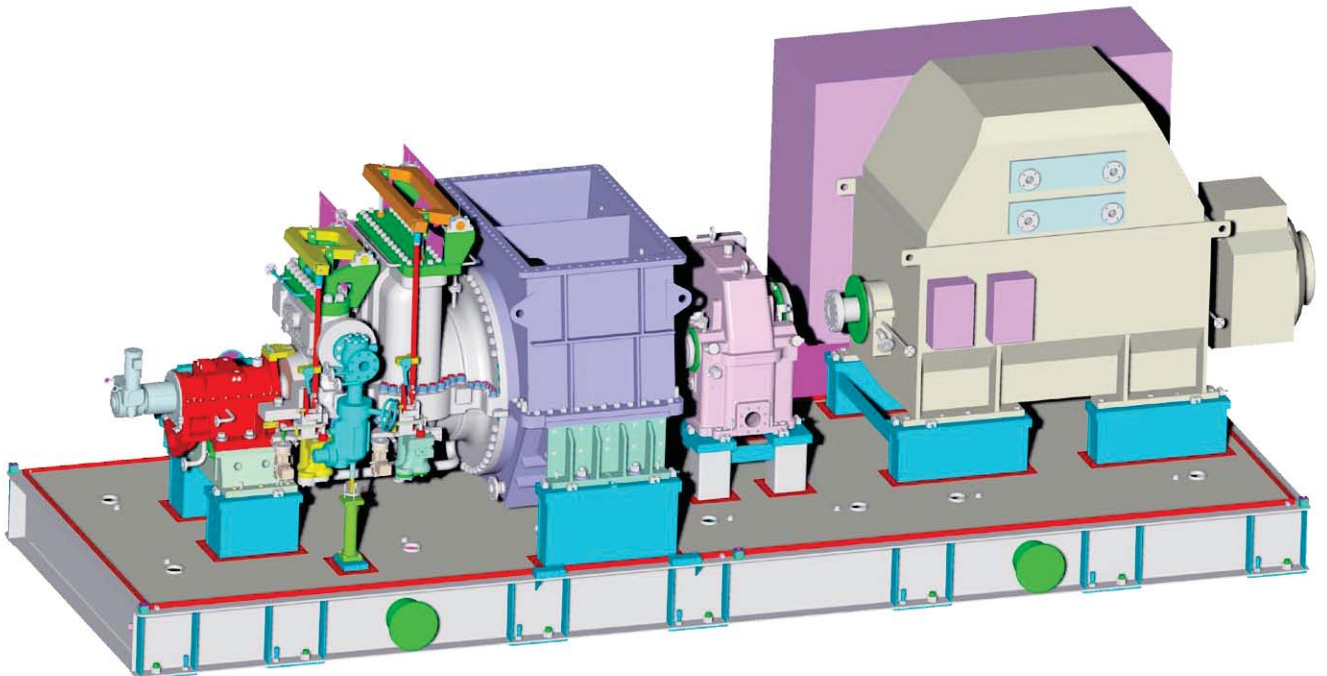
Elliott offers sophisticated, flexible, easy to use STG control systems. Operators can manage their systems in any of several modes, e.g. island, black start, tandem, paralleled generation or grid interfaced. These systems can also be configured to communicate with all of the most common control interfaces in use today.

- ◆ PLC-based monitoring: vibration, RTD, pump, pre-alarms, trip system
- ◆ Touch screen interface (HMI) for easy, accurate display and control
- ◆ Auto & manual synchronizing with synch check protection relay
- ◆ Independent overspeed trip protection
- ◆ Multifunction generator protection relay
- ◆ Excitation control (automatic voltage regulator)
- ◆ Network communication and remote access capabilities



## Integrated Technology

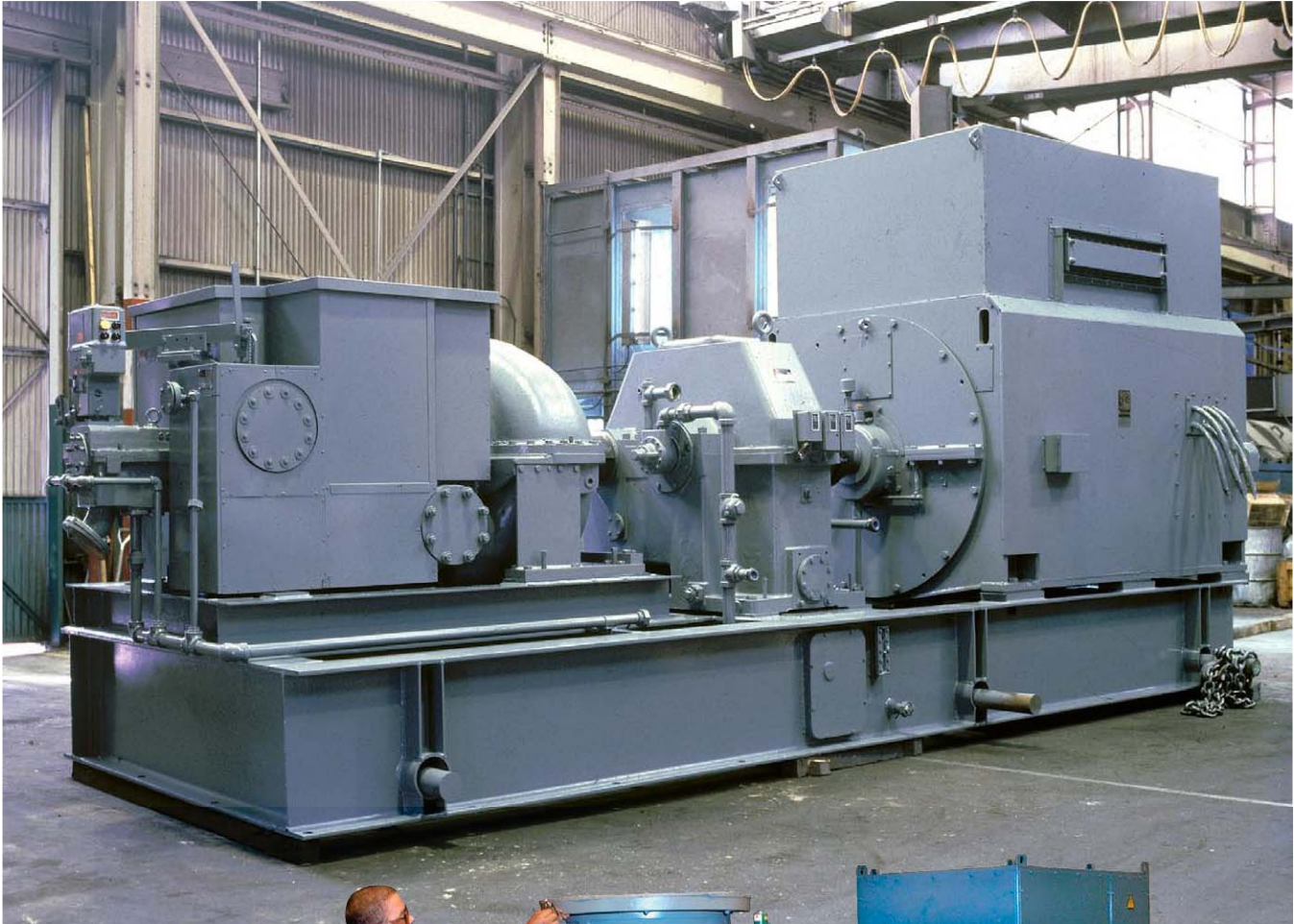
Elliott's use of the latest engineering technology simplifies the integration of STG designs into existing steam and process systems, reducing installation time and construction costs. Elliott's proprietary design software maximizes turbine efficiency to generate power as cost-effectively as possible.



## Complete packages

An Elliott turbine generator set is a completely integrated package. Working from your requirements, Elliott engineers design each unit to ensure trouble-free installation, start-up and operation. Elliott also keeps lead times short and costs down through the use of standard, proven components.

A typical synchronous steam turbine generator package includes a steam turbine, gear, couplings, generator, baseplate, control systems and lube console. Elliott can also provide auxiliary systems such as electrical switch gear and condensers. Directly connected induction generator packages are available, as well.



*This integrated Elliott turbine generator package (above) includes a multi-stage condensing turbine, a speed reduction gear and a 6 MW synchronous generator.*



# Comprehensive Global Service

For over 80 years Elliott's field service and technical support engineers have installed, commissioned and serviced Elliott and non-Elliott turbine generator sets. Elliott's global service network meets the needs of customers throughout the life of their equipment.

## Field Service



Elliott's teams of field service project managers, technical advisors and skilled labor support planned and unplanned outages, overhauls, repairs and ongoing maintenance programs. Elliott teams are equipped with the tools to complete a job quickly and properly, including fully equipped portable machine shops and balance machines. An emergency response team is available at all times.

## Field Machining

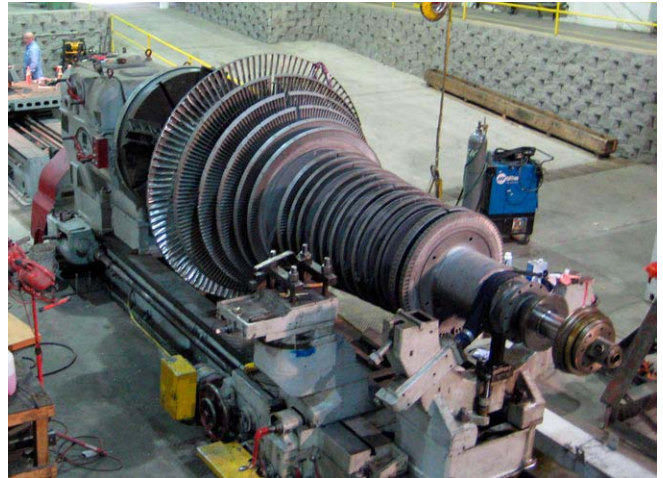


Elliott has the capability to perform field machining procedures when equipment cannot be easily removed and shipped to a repair facility. Our portable lathes and portable milling, boring, grinding and drilling machines handle nearly all potential field machining needs.

## Rerates & Upgrades

Elliott Rerate Services maximizes your long-term investment in critical rotating equipment. Through rerates, upgrades or reapplication of used equipment, Elliott can improve the performance of machinery from any manufacturer, enhancing operating efficiency, reducing operating costs or support increased plant capacity

## Repair Facilities



Our network of full-service repair shops are strategically located throughout the world to service and repair Elliott and non-Elliott turbomachinery. Each shop is staffed by skilled personnel with extensive experience in repair techniques and procedures ranging from inspections and overhauls to weld repair, specialty machining and fabrication.

## Service Parts Organization

Our ISO 9001 certified Service Parts group provides customers with the confidence and cost savings associated with high quality, original Elliott parts. Dedicated machining centers, extensive finished parts inventories and customer support are available 24 hours a day, 7 days a week. Customers receive the precise parts they need quickly and reliably. Elliott Service Parts engineers work closely with customers to develop tailored parts management programs, including inventories, routine maintenance and upgrade kits, and pricing agreements.

## Training

Elliott regularly trains machinery operators, mechanics, engineers and instrumentation personnel in the proper operation of equipment. Participants gain the knowledge and confidence that translates into a safer work environment, enhanced operating efficiency, and extended equipment life. Elliott offers training at its own facilities, as well as at customer sites and tailored to customer requirements.



Elliott Company reserves the right to modify the design or construction of the equipment described in this bulletin and to furnish it, as altered without further reference to the illustrations or information contained herein.

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