Turbine Inlet Air Chilling
Stellar Energy

Stellar Energy’s TIAC solutions integrate proven chilling technology, comprehensive process design and state-of-the-art controls to deliver a TIAC system optimized to balance efficiency and capital cost. Based on our extensive experience and in-house capabilities, we can guarantee performance parameters to ensure the success of your project:

- Over 20 years of experience with TIAC systems
- TIAC systems on over 80 Gas Turbines
- Over 1400MW of installed capacity enhancement
- Over 800,000 TR of chilled water plant experience

Company Overview

Stellar Energy is a global leader in the design, construction, fabrication, installation, and servicing of a range of energy systems, including turbine inlet air chilling (TIAC) systems, modular utility plants, district cooling plants, and field-erected utility plants (built on-site). Our experience spans more than 20 years and stretches across the globe, with offices in the United States, China and the Middle East and North Africa (MENA) region.

We draw upon extensive and experienced in-house resources to provide:

- Feasibility Analysis
- Design & Engineering
- Fabrication & Installation
- Turnkey Project Delivery
- Startup & Commissioning
- Operation & Maintenance (O&M)
TIAC Benefits for Greenfield & Retrofit Projects

Combustion Turbines lose output capacity as ambient temperatures rise. The result is reduced available power output when power is in greatest demand and most valuable. Turbine Inlet Air Chilling unlocks a combustion turbine’s output potential during peak times by providing the cool inlet air required to achieve 10% to 30% output gains and reduced Heat Rates associated with more ideal operating conditions. However, enhanced capacity is only one of many benefits of TIAC:

**Low $/kW Capital Cost**
TIAC system capital costs are often half the $/kW of a new peaker plant.

**Dependable and Readily Available Power**
Chiller based TIAC systems, unlike evaporative cooling or fogging, are designed to achieve a constant inlet air temperature. The result is consistent and predictable power output. Also, TIAC systems can be designed with quick-start capabilities that make additional power available within a few minutes.

**Fast Project Delivery**
TIAC systems can be brought online within 6 to 9 months of project release. TIAC retrofit projects also typically have limited or no permitting requirements.

**Fleet-wide Heat Rate Improvement**
TIAC systems can be installed on Combined Cycle plants to provide peaking capacity with superior heat rates to those of Simple Cycle peaker plants. This environmental benefit can thus reduce the net carbon emissions of your complete energy fleet.

**Energy Storage**
TIAC systems can incorporate Thermal Energy Storage which shifts the power required to run the chilling system to off-peak times, when power is in less demand. This increases the power available for dispatch during peak periods.

**Reduced Emissions**
When installed on a Combined Cycle plant, TIAC can reduce emissions by providing peak capacity at Combined Cycle heat rates and lower emissions than a peaker plant, TIAC can also be fueled by renewable energy or waste heat. The chilling achieved in this fashion can in turn improve any gas turbine’s heat rate by providing cooler inlet air and consequently reducing overall emissions.
Heat Transfer

Options:
- Internally Mounted Coils
- Bulk Air Cooler

Chiller

Options:
- Centrifugal
- Compound Centrifugal
- Absorption
- Screws

Guaranteed Project Delivery

- Project Schedule
- Submission of Drawings
- Delivery of Equipment to Site
- Startup and Commissioning Completion Date
- Project Cost

Griffith, Arizona

Chiller Modules Manufactured in Jacksonville, Florida

*Power plant model provided by Harris Group, Inc.*
System Performance Guarantees

- Inlet Air Temperature
- Air-Side Pressure Drop of Coils
- Supply Chilled Water Temperature to Coils
- Supply Chilled Water Flow to Coils
- System Efficiency
- System Capacity
- Noise Levels
- Maximum Water Makeup Rate
Services

Feasibility Analysis
We provide studies of the technical, operational and financial aspects of an individual generating asset or for an entire portfolio. Our analysis will provide the information and capital requirements needed to determine whether to go forward with the project.

System Design
We follow an engineering-driven approach to define the optimum chilling solution for our clients’ power plants. Stellar Energy evaluates all viable technical solutions including filter house retrofits, refrigeration system options, heat rejection methods, water usage, control methodology and thermal energy storage.

Fabrication
Stellar Energy’s fabrication facility in the United States was designed for and is dedicated to, the production of our Plug and Chill™ modular chiller plants. We offer pre-designed systems that have evolved over 15 years and can be customized to suit specific requirements as requested.

Turnkey Project Delivery – Optional
Stellar Energy’s team of process engineers, project controls engineers, project managers, construction managers, and skilled laborers can provide turnkey delivery of TIAC projects for both Greenfield and Retrofit projects. Stellar Energy has field staff and self performs mechanical trades as needed to suit your situation.

Startup, Commissioning, Maintenance, Parts & Operations
Our experienced service technicians and controls engineers ensure timely startup, commissioning and testing. Stellar Energy leads the industry with service technicians and controls engineers to serve your TIAC needs.
Modular Chiller Plant Benefits

Compressed Delivery Schedule
Chillers modules are fabricated while civil work occurs on site

Reduced Site Work
Labor is moved to the fabrication facility reducing time, manpower and activity on site

Cost Competitive
Elimination of the cost of a building reduces overall cost

Reduced Footprint
Modules are designed to minimize footprint while maintaining necessary maintenance space

Phased Delivery
Modules can be delivered in phases to match demand as it comes online and delay capital expenditures

Quality Control
Fabrication facility quality control systems in a controlled environment ensure superior quality

Standard Module Designs with the Option for Full Customization

Stellar Energy maintains 50 standard chiller module designs that can serve loads from 300TR to over 50,000TR and are frequently applied to the following gas turbines:

• GE LM6000
• GE Frame 6
• GE 7FA
• GE 7EA
• GE 9FB
• GE LMS100
• Mitsubishi “F” Class

Stellar Energy can provide TIAC for any gas turbine and deliver any level of customization requested to match a project’s specific requirements.