PRODUCT / APPLICATION INFORMATION

Power Generation

Our global population continues to grow, yet the livable space cannot be changed. This ever evolving growth brings with it demands that are real and challenging. The need for electricity is one of those demands. To meet that requirement, the need for Grassroot Combined Cycle electrical power generating projects continue to rise for many reasons:

- ever-increasing global power demands
- older plants being decommissioned
- premature retirement of globally positioned nuclear power generating stations

Generating power is not new, but the way its produced continues to be very controversial. Natural gas has long been embraced and agreed upon as a clean burning fuel with limited emissions. Additionally, its cost continues to fluctuate at levels making it attractive to increase production through "fracking". This method continues to make it attractive and cost prohibitive to develop more Gas –fired Combined Cycle Co-Generation plants on a global scale.

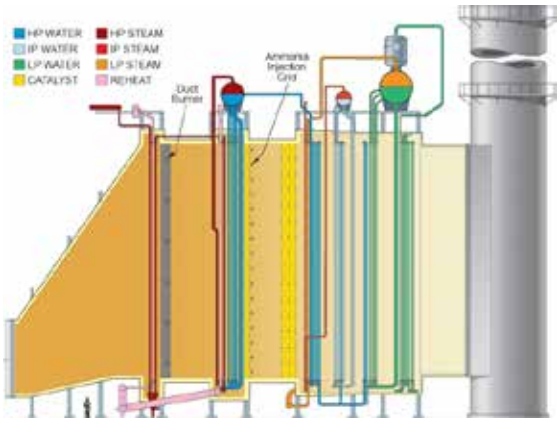
When power generation is required to satisfy "base load" electrical power needs, the hot exhaust gases are directed to a HRSG (heat recovery steam generator) where the thermal energy is captured to generate steam. Some industries, like refineries and chemical plants, use this steam for process operations, but primarily it is used to generate electrical power via a steam turbine. The steam in a boiler and its feed water is generally treated with 50% caustic for de-mineralization.

The main steam transport and chemical feed lines often require electrical heat tracing to maintain temperatures, preventing crystallization. In addition, safety showers and eye wash stations may require electrical heat tracing to insure a constant flow of properly maintained water for safety purposes. In lower ambient climates and where sub-freezing is possible, winterization (freeze protection) of critical lines may be necessary, such as:

- water lines
- fire protection lines
- instrument lines
- sample lines
- drains

TubeTrace Bundles are ideal for CEMS

Typical HRSG units capture Combustion Turbine exhaust to generate steam. This is most often used for additional power generation.



HRSG cross-section reveals steam sampling and chemical injection lines that require EHT and/or insulation to reduce heat loss and/or for personnel protection.

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To ensure the HRSG is operating properly, the steam is carefully analyzed and chemically adjusted on a continuous basis. To prevent condensation from freezing and damage to the turbine, winterization of the small diameter chemical feed and steam sample lines (LPS, IPS & HPS) is typically solved by using a properly engineered pre-insulated and heat traced tubing bundle. In most cases the steam sample lines are routed to a common analyzer shelter, which may be more than 100M (328 ft.) or more apart.

Thermon TubeTrace type SEI/MEI-HT/HTX is a pre-engineered solution and designed for this purpose with exposure temperatures up to 593ºC (1100ºF), maintaining freeze protection, yet protecting the heat tracer from the elevated steam exposures, providing a worry-free flow and performance year-after-year. In some cases, where ambients are not subject to freezing, heat tracing may not be required. However, the tubing must be insulated and designed to withstand the elevated exposures – for the process and personnel protection. Thermon ThermoTube type SL-HT/HTX is the perfect solution for this requirement.

In addition to protecting the chemical feed, steam sample and instrument lines, the environmental governing agencies typically require monitoring of methane, volatile organic compounds and other trace gases that are associated with the production, processing, storage and transport of natural gas at the stack. Emissions in the exhaust gases passing through the SCR (Selective Catalytic Reduction) at the HRSG are also monitored for CO and NOx. Thermon TubeTrace type SE/ME products are designed to provide accurate samples and run time.

Products and uses for consideration are:

- Thermon Electric heat tracing – for piping, tanks, vessels, etc.
- Thermon Pre-insulated and/or heat traced tubing – for high/medium/low pressure steam lines, instrument lines, chemical feed lines, SCR and stack gas analytical sample lines, etc.
- Thermon Hopper heaters
- Thermon heat trace control systems

Typical Combined Cycle Power Station

TubeTrace SEI-HT Shown

ThermoTube SL-HTX Shown

In addition to the electrical heat tracing and pre-insulated and/or heat traced tubing bundles, Thermon also offers and provides the complete line of termination kits, accessories and controls as well as a full plant audit services and turnkey installations.

For more information or assistance, please visit us at www.thermon.com or contact your local Thermon office, representative or agent.