Pietro Fiorentini thanks to 70 years experience with Natural Gas equipment design and manufacturing is able to provide the complete fuel gas system for the gas supply to the GT (Gas Turbines). The plus we can offer is the advantage to have one single supplier for all the mechanical and electrical equipment complete of the supervision system.

### Inlet Section

**ESD (Emergency Shut Down)**

Situated at the inlet of the Fuel Gas System it grants the closure of the flow into the pipe in case of an emergency. It can be remote/manually operated with different possibility for the re-opening and re-pressurization of the downstream lines. Usually composed of a small skid mounted unit with one actuated ball valves next to a manual gear operated one.

**HIPPS (High Integrity Pressure Protection System)**

A certified SIL 3 (safety integrity level) skid can be used as ESD system in place of a simple ESD. Pietro Fiorentini can provide the HIPPS package complete of certifications, PFD report and SIL 3 issued by a third party.
### Filtration

Pietro Fiorentini can design customized filters according to the design conditions and installation constrains.

- Single stage/ double stage
- Vertical/ horizontal
- Quick opening closure (QOC)
- Manual/ automatic drain
- Vent valves
- Condensate tank with manual/ automatic drain circuit

### Power Plant

- Drain level indicator/ transmitter and alarms
- Level switches
- DP indicators and transmitters
- Maximum efficiency, reliability with the lowest possible delta P across the filter
- Designe considering annular velocity limit and cartridges limit

Skid mounted with the possibility to be shipped separately are installed downstream the ESD and the KO DRUM, if present. They can remove both liquid or solid particles up to a maximum efficiency of 99.9% for particles up to 3 micron.

### KO Drums

Placed after the ESD skid it is used as a single filter to remove the most heavy particles inside the gas. Thanks to the impingement or gravitational effect it is only used in case of dirty gas.

### Filter type

**Gas - Solid separators**
- Cartridge filter
- Mini cyclone separator

**Gas - Liquid separators**
- Demister (Wire Mesh) separator
- Vane separator
- Coalescer filter
- Cyclotube

**Gas - Liquid - Solid separators**
- Two stage filter separators

### Condensate tank

- Placement of skids with the possibility to be shipped separately downstream the ESD and the KO DRUM, if present. They can remove both liquid or solid particles up to a maximum efficiency of 99.9% for particles up to 3 micron.
Pietro Fiorentini can design and manufacture accurate metering system necessary for:

- Custody transfer and invoicing
- Measurement of generator efficiency

Custody transfer metering skids are used for invoicing at the delivery point where gas is changing hands and every cubic meter of fluid has to be accurately accounted for its delivery conditions such as pressure, temperature, energy values and contaminants.

For this reason packages can be supplied complete of gas chromatograph and flow computer.

We have experience in metering system with alternatives meters: ultrasonic, turbine or orifice.
The heating section is needed for the following reasons:

- Gas Dew Point heating: high-pressure natural gas heating upstream pressure regulation stations preventing condensation phenomena due to Joule-Thomson effect.
- Heating of high pressure natural gas upstream pressure regulation in order to prevent external icing formation.
- Fuel gas super-heating upstream gas turbines (Performance heaters)
Natural gas is usually highly pressurized as it travels through transport pipelines. But once it reaches the consumers, it needs to be brought up to the contractual specifications for delivery. This often means that solids and liquids have to be filtered out, the pressure has to be reduced, and the gas may need to be preheated to counteract the cooling effect of the pressure reduction. And last but not least, the downstream consumers need to be protected from being exposed to the full transport pipeline pressure.

- The regulator is the key item of the system
- Wide range of products
- Rubber produced internally
- Accurate supply pressure
- Quick response
- System redundancy
- Safety device for overpressure protection

Final filtration is composed of a vessel that removes all the liquid and solid particles contained in the fuel gas. The configuration is usually a single stage filter that can be composed of coalescing cartridges or in case of a scrubber of mini cyclones.
Higher efficiency power plants are increasing and a growing number of combined-cycle power plants are incorporating fuel gas performance heaters as a means of improving overall plant efficiency. This heating, typically increasing fuel temperatures in the range of 365°F/185°C up to more than 200°C, improves gas turbine efficiency by reducing the amount of fuel needed to achieve desired firing temperatures. Proper design and operation of the Gas Fuel Heating System is critical in insuring reliable operation of the gas turbine.

**Turn Key projects**

PIETRO FIORENTINI SERVICE

Commissioning – Start-up activities, Repairs, Spare Parts, Maintenance Program
The data are not binding. We reserve the right to make eventual changes without prior notice.

CT-s 580-E December 10