

Turbogas Combined Cycle Power Plant in Presenzano (Italy)

General informations

- ✓ Years: 2020-2022
- ✓ Customers: GeKO SpA
Ansaldo Energia
- ✓ End customer: Edison
- ✓ Value of designed work:
€ 36.000.000
- ✓ Total value of work:
€ 43.000.000 euro

Final architectural and structural design of the main buildings of the combined cycle power plant.

Structural design of the special foundations. Design of surface systems (roads and finishes) and utilities (civil and industrial facility networks).

The Presenzano plant will have a nominal power of around 760 MW and will consist of two production cycles: gas and steam. In particular it will be equipped with:

1 gas turbine (TG), class H, with a power of 505 MW;

1 recovery steam generator (GVR), where the hot exhaust fumes from the gas turbine are used to produce high pressure steam.

1 steam turbine (TV), with a power of 255 MW in which the steam produced by the recovery steam generator expands, causing the turbine to rotate and therefore a second electric generator, with the production of additional electricity.

1 air condenser, in which the exhausted steam, coming from the steam turbine, is condensed using air coming from the external environment and re-emitted in the process.

Characteristics of the project

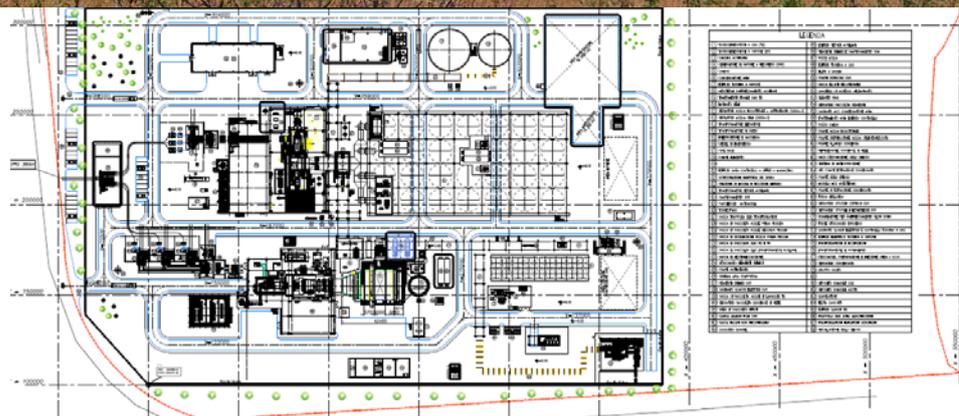
The main buildings are made by metal structure with vertical paneling and roofing made up of corrugated sandwich panels. They respectively house the Tg machine room with the adjacent Air Intake building and the TV machine room with the adjacent TV electrical building.

The TG Building, equipped with a main overhead crane with a capacity of 160 tons and a secondary one of 30 tons, is approximately 26x45x h 30m in size, the Air Intake building, adjacent to it, measures 22x27xh 17m.

The TV building, equipped with a bridge crane with a capacity of 85 tons, is approximately 32x57x h 27m in size, the electrical building, adjacent to it, measures 22x50x h9m. These buildings have deep foundations on piles. There are also elevation works in reinforced concrete, such as transformers, supports for machines as well as tanks for containing acid and/or oily liquids.



The plant under construction



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BIM design

The design was carried out entirely in a BIM environment. The structural design and the design of the underground has been carried out in the Tekla environment, while the architectural one in Revit. The elements both in Tekla and in Revit have been designed in such a way that they can already include the information useful for preparing the estimates, such as, for example, weight, quantity and type of steel in TEKLA, while in Revit the stratigraphies of both the masonry and roofing.

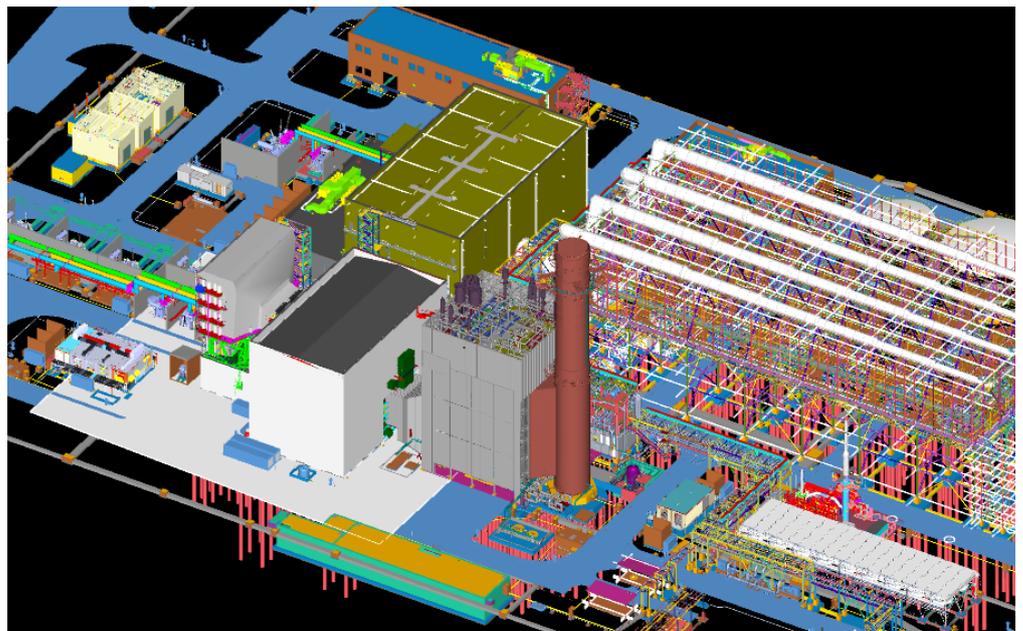
Implementation aspects

Starting from the indications provided by the Customer (operating loads, production requirements, layout of the machinery and pipes, anchorages, etc.), the design of all the steel structures in elevation and of all the foundations was carried out (including the underground networks and the turbine stands) provided for in the plant.

All the structures in elevation, with the exception of the trestles of the turbines and the wet towers, were made of steel providing, depending on the plant requirements, floors in grating, checkered sheet metal or sheet metal cast with concrete. The static analysis and checks were carried out in accordance with the Italian standard NTC2018 relating to seismic actions and, consequently, by applying the response spectra and the ultimate limit states checks.



The seven "dimensions" of B.I.M. refer to the building life cycle



Bim model of the plant including the structures modeled in TEKLA and the architecture modeled in Revit