Istroenergo group a.s.

Contact Jaroslav Konôpka
Address Rozmarínová 4
P.O.Box 157
934 01 Levice, Slovak Republic
Phone +421 36 6376 111
Email ieg@ieg.sk
Website www.ieg.sk

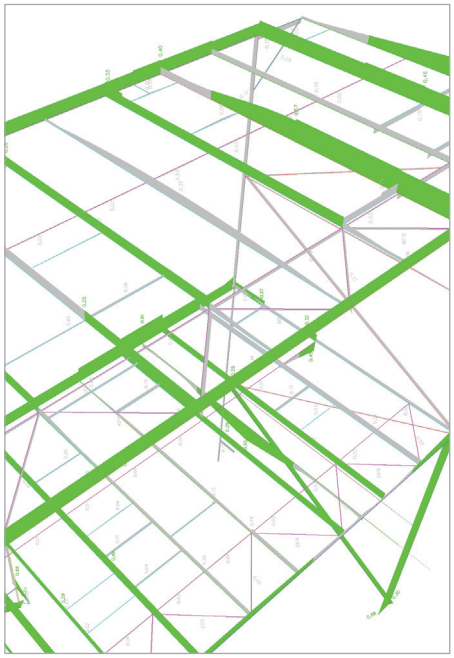
The company IEG was established in 1992. It is aimed at power engineering. Since the very beginning of IEG, the goal was to build up its own know-how, with the capability to provide integrated services up to turn-key deliveries.

Today, IEG is one of the most important Slovak exporters of power generation technology and projects.

IEG is building up this position by developing its own know-how in the areas of engineering, project management and the construction of power generation units.

The main IEG work scope

- World class in engineering and complexity of power plant design and deliveries
- Development and design of projects and equipment
- Engineering and technical documentation preparation, supervision, technical assistance and licences
- Manufacture, purchase, completion of power equipment, delivery of power equipment and turn-key delivery of power plants
- Erection and commissioning
- Guarantee and after-guarantee services



Software: Scia Engineer

Heat Recovery Steam Generator - Wilton, United Kingdom

General

The boiler design is based on state of the art technology to deliver high pressure steam (98 bar) for steam consumers in a big refinery plant, in Wilton, Teesside, North-East of England. A boiler with supplementary firing is installed downstream of the industrial heavy duty Gas Turbine Frame 6B (General Electric). The nominal output from the boiler is steam with the parameters: 98 bar, 385° C, 180 t/hr. The final customer and operator of the boiler is SembCorp. The erection started in 2008 and has been finished successfully in 2009.

IEG was the designer and supplier of HRSG, HRSG platforms, staircases, stack and feed water system included feed water tank (FWT) with de-aerator, feed water pumps, exchangers, pipes with valves and a supporting steel structure. The HRSG structure with platforms and staircase has as dimensions 20 x 11.6 m and the top platform is situated 20.6 m aboveground. The FWT structure has as dimensions 12 x 6 m and the top platform is situated 11.6 m aboveground. The total weight of the steel structure is almost 300 tons.

Description of the Construction

HRSG, FWT and steel structure platforms were interconnected so that they allow relative displacement of each structure part. Except for the boiler, all the structures were designed with bolted interconnections, steel columns and galvanized beams.

Heat Recovery Steam Generator

The HRSG consists of two heat exchanger modules and two parts of flue gas ducts. All parts of the HRSG were calculated separately. The main module structure consists of a frame construction with four massive columns. In each module are placed finned tubes which are hung at top of the main frame construction. In the modules are steel plates to guide the finned tubes. The staircase is located on the left side of the HRSG, platforms and ladders are located on the right side. Two platforms are extended around the stack and are joined to the staircase, so it is easy to get from one side of the HRSG to the other. Platforms accessing the boiler drum and steam silencers are situated on the top of HRSG. The stack is equipped with a 360° platform at +40.0 m above ground, to provide access to different measuring points/nozzles on the flue-gas.

Calculations

Various loads were determined: self-weight, imposed load, load of finned tubes, water tank at top of module, wind, water in tank and pipes, overpressure, loads from steam pipes, loads from connected structures, insulation weight, etc.

Calculations of various combinations were extended to transport and erection positions. During transport in horizontal position and the erection on site, the HRSG modules were equipped with a special construction which was able to keep each module in a correct position and safe deformation.

Feed Water Tank structure

The FWT construction is a main frame structure for the feed water tank, weighing 60 t with water, placed on a platform 11.6 m above ground. The structure has another platform +6.0 m where heat exchangers and pipes are placed. Pipes which are led at the FWT construction are supported or hung on the main structure.
It was requested to keep one axis of columns from the road side without any bracing to ensure easy installation of technology and pipes.

The FWT construction was manufactured in Slovakia and transported to the site in several parts. The erection was swift due to the prefabricated construction and the fact that all connections were bolted.

Calculations

Various loads, such as self-weight, water tank weight, wind, imposed load, pipes, other technology and trolley cranes, were calculated.

Scia Engineer software, introduced to IEG short time before the beginning of the project, was used for structural calculations. Since then it has become our main CAE software, a powerful tool for calculating all power plant steel constructions. The compatibility with various CAD software, Tecla Structures and other programs makes it a very progressive aid for designing our actual and future projects.

Heat Recovery Steam Generator

Wilton, United Kingdom

Project information

Owner	SembCorb
General Contractor	Aker Kvaerner
Engineering Office	Istroenergo Group, Inc.
Construction Period	From 2008 to 2009
Location	Wilton, Teesside, United Kingdom

Short project description

The project is about a heat recovery steam generator and a feed water tank structure. IEG is the engineering company for the platforms, staircases, stack and feed water system including a feed water tank with a de-aerator, feed water pumps, pipes, and supporting steel structures. The boiler design is based on state of the art technology, to deliver high pressure steam (98 bar) in a big refinery plant. A boiler with supplementary firing is installed downstream of an industrial heavy duty Gas Turbine Frame 6B. The nominal output of the boiler is steam with the parameters: 98 bar, 385° C, 180 t/hr.