

Advanced Flue Gas Desulfurization Plant

ENVIRONMENTAL PROTECTION. EDL completes EPCM project for Gunvor Raffinerie Ingolstadt after three years.

LEIPZIG. Stricter legal requirements for sulfur dioxide emissions were the impetus for Gunvor Raffinerie Ingolstadt (GRI) to initiate the MINERVA (Modern Ingolstadt Emissions Reduction Via Amine) project. The project covered planning and construction of a flue gas desulfurization plant and its integration into existing plant facilities. The project was implemented as part of the BVT (Best Available Technology) environmental initiative with the aim to efficiently reduce sulfur dioxide emissions. For this purpose, the refinery selected a process from one of the world's leading energy companies. This process converts the separated sulfur dioxide (SO₂) in the existing Claus plant into elemental sulfur, which is provided as a chemical precursor for the industry.

Plant engineering and construction supervision – Made by EDL

In 2020, Gunvor Raffinerie Ingolstadt commissioned EDL from Leipzig with a pre-basic engineering, and in 2021 with the execution of the front-end engineering design (FEED), including a cost estimate as well as the detail engineering for long lead equipment items. After this project phase had successfully been completed, EDL also received the order for the detail engineering and construction

supervision of the flue gas desulfurization plant. In 2022, detail engineering was completed for the most part.

The first construction activities in the FCC plant area started in the winter 2021/2022. They were extended to include the hydroskimming plant area in spring 2022.

The first equipment items were installed in spring 2023 as part of the scheduled turnaround. The flue gas desulfurization plant was accomplished in the first quarter of 2024 and is now being commissioned stepwise by Gunvor Raffinerie.

EDL's Project Manager Matthias Haring

summarizes: "The very fruitful and good cooperation with the customer GRI pulled its weight to an efficient elimination of technical problems and obstacles that occurred. Planning during the Corona pandemic, bottlenecks on the global market, and challenging transport routes imposed high requirements on all parties involved. Due to a lack of capacities among assembling companies and contractors, the implementation was difficult. Looking back, however, we can state that the team, consisting of specialists from EDL and GRI, faced these challenges and achieved a good result."

Fit for the future thanks to the MINERVA project

MINERVA is the largest individual



I would like to thank everyone involved very much for the excellent cooperation.

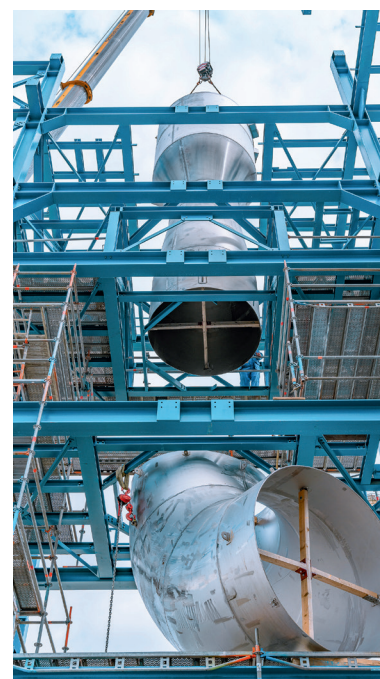
Matthias Haring
Project Manager EDL



Lifting of the lower column section – diameter 5.8 meters, length 19.1 meters, weight 52 tons – onto its foundation.

project at Gunvor Raffinerie Ingolstadt GmbH. In addition to significantly reducing SO₂ emissions, the refinery also increases flexibility in the crude oil selection to strengthen its international competitive position. With the implementation of this project, environmental regulations will permanently be met at the Ingolstadt location.

- ▶ Installation of one of two Venturi scrubbers
- ▶▶ The upper section of the column – 44 tons in weight and 14.9 meters long – was installed and completed with the 38-meter-long and 23-ton heavy smoke-stack.



TRANSPORT AND INSTALLATION OF THE LARGEST EQUIPMENT ITEM

After thorough investigation of the transport route and obtaining the necessary permits, the shipping company set off with the column (diameter 5.8m, length 33.5m, weight more than 100 tons) from Lower Rhine to Ingolstadt at the end of October 2022 – first by riverboat on Rhine, Main and Main-Danube Canal to Kelheim, from there as road transport to the refinery. Aside from the usual difficulties with narrow town passages, the extremely low water levels were also challenging.

In summer 2023, after completion of the required foundations, concrete, and steel structures,

the large equipment items were lifted into place. The two Venturi scrubbers to be mounted on the right and left of the column were installed first. Then the lower section of the column (diameter 5.8m, length 19.1m, weight 52 tons) was placed on its foundation. Only one day later, the upper section of the column (length 14.9m, weight 44 tons) was added, and the two halves of the column were welded together. Afterwards, a 38-meter-long and 23-ton weighing smoke-stack was put on. With a total height of 83 meters, this structure is now a prominent landmark of the refinery.

- ▼ Transport of the column - 33.5 meters long, more than 100 tons in weight, with a diameter of 5.8 meters - by riverboat on the Rhine, Main, and Main-Danube Canal to Kelheim.
- ▲ The second part of the heavy goods transport – by road.

