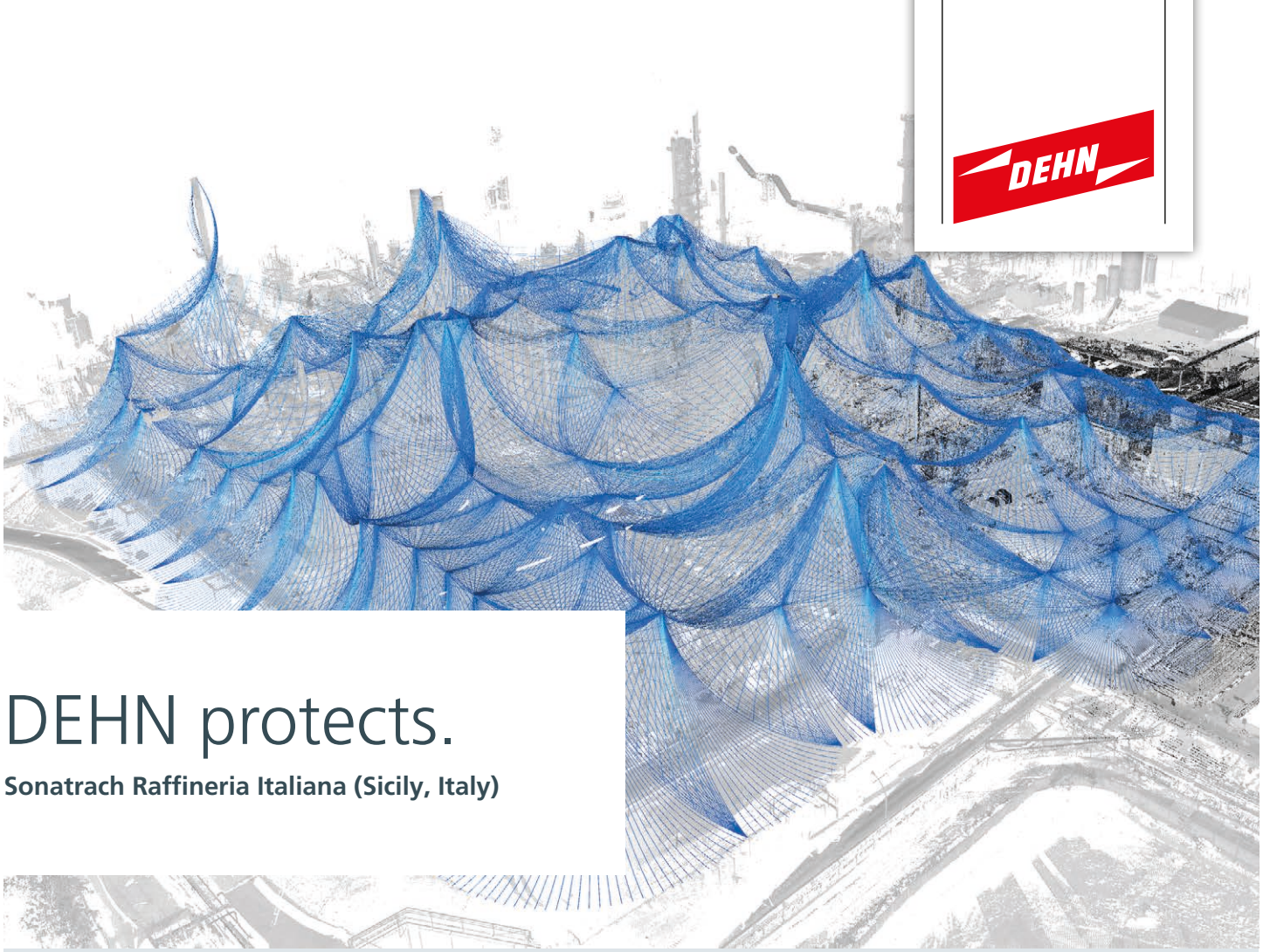


DEHN protects.

Sonatrach Raffineria Italiana (Sicily, Italy)

Customer

Sonatrach Raffineria Italiana S.r.l. con socio unico

Project overview

Sector

Oil industry

Application

3D laser scan of the plant including 3D planning of the external lightning protection system

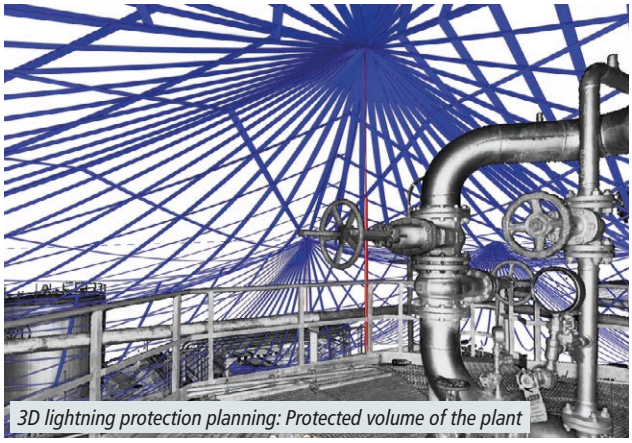
Hardware

AVEVA Everything 3D™

DEHN protects.

Sonatrach Raffineria Italiana (Sicily, Italy)

3D laser scan: Digitalisation of the plant



3D lightning protection planning: Protected volume of the plant

Sonatrach is the largest state-owned company in Algeria and, at the same time, one of the largest energy companies in the world. Its main focus is on the exploration, transport, processing and distribution of oil and gas. Sonatrach Raffineria Italiana is one of the largest petrochemical complexes. The refinery is located on the Italian island of Sicily and is the leading European producer of lubricants, bitumen and paraffins.

Challenge

Safe operation and maximum availability are the top priorities for such an extensive plant as the Sonatrach Raffineria Italiana. For this reason, it is necessary to thoroughly plan and implement a detailed lightning protection concept. In order to completely protect the complex process area against direct lightning strikes, the entire plant was planned in accordance with class of LPS II (LPL II*) and the Part 3 of the IEC 62 305 standard. The size and expansiveness of the site presented a particular challenge: The refinery covers an area of about 1.9 km^2. As the basis for planning the lightning protection system, an area of approx. 250,000 m^2 was scanned within just a week and then converted into laser scan data with a size of approx. 850 GB.

Solution

The focus of 3D laser scanning is a holistic view of the individual parts of the plant and building. For this purpose, the refinery was divided into 5 scan areas. This subdivision was also necessary due to access restrictions in specified safety and Ex areas of the plant. Whilst the plant continued to operate as normal, special digital 3D laser scanning technology was used to create the basis for determining and visualising the protection requirements of the individual areas. The laser scans consist of individual point clouds. These are then processed and consolidated using appropriate software. The result is a detailed 3D point cloud (see cover picture) on the basis of which it is possible to precisely plan the external lightning protection system and clearly display the protected volumes of the air-termination systems. 3D planning also enables optimum positioning of air-termination systems in the plant. This minimises installation and material costs. A further advantage is that the concept is absolutely viable for the future – any plant extensions can easily be integrated in the existing 3D model.

Benefits of 3D laser scanning

- Laser scanning can be performed during plant operation.
- Saves time at the preliminary planning stage – time-consuming redesign based on as-built plans is no longer necessary.
- Exact measurements and high-quality planning – the "3D as-built" model of the plant provides an optimum foundation for the precise 3D design of lightning protection.
- Data output in various formats for further usage (e.g. E57, .nwd …)

Benefits of 3D lightning protection planning

- Errors are minimised - the protected volumes are clearly visible 360° around the building.
- Air-termination systems can be reduced to a minimum thanks to 3D visualisation. This saves time, material and resources.
- The existing 3D model can be quickly and easily adjusted to include any future extensions to plants/buildings

(* Lightning Protection Level)

Surge Protection
Lightning Protection
Safety Equipment
DEHN protects.

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