



## DEHNconcept Planning Service

for lightning and surge protection systems



*Lightning and surge protection is a very complex subject. Planning takes time, requires familiarisation and adds to work loads. So, the option to have absolutely everything done by DEHN is the best thing for me. I save time and my people can work on other projects. I genuinely had no idea that so much could be saved through more precise material calculations.*



## DEHN know-how for your projects

Since 1910, a proven track record in lightning and surge protection and decades of experience in the planning of lightning and surge protection systems – that's DEHN.

### **Make use of this know-how**

Petrochemical plants and power stations, production facilities and office buildings – they all require reliable protection. To make you safe and ensure work and production processes run reliably.

### **Make use of the services from DEHN for your planning.**

### **Ensure availability – protect human lives**

With DEHNconcept, you get the project design for the entire protection concept of your object and the planning as a complete module.

### **Advantages for you:**

- You save time – because DEHN does the planning work.
- You save material – thanks to an exact calculation, you only use the materials that are actually needed.
- You save resources, because your people do not have to deal with the complex and time-consuming subject of lightning and surge protection. They can use this time to work on other things.

# DEHNconcept – what you can expect

This is how the process looks for you when planning with DEHNconcept:

## Questionnaire

Compile the key data for your project here. We will then be best able to prepare for our discussion.

## Preliminary discussion

What scope of services do you require? We will agree on this beforehand.

## Offer

Based on this agreement, you will receive an offer for the services in question. You then grant us a planning contract.

## Specification

In a follow-up discussion, together we discuss how the planning service will look in detail for your project. What special considerations are there from a construction perspective?

What are the correct usage guidelines?

Are there safety-related instructions?

If this discussion takes place at your location, we will take a close look directly at the building and installations.

## Planning

In this phase, we will create the optimum protection solution for your specific safety requirements.

## Concept

You will then receive the finished protection concept, complete with as-built drawings, detailed drawings, textual descriptions with image and design documentation, as well as bills of materials.

We look forward to presenting the project at your location and advising you on its implementation.

## Contact us

DEHNconcept

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# Risk analysis and risk assessment

The basis for the planning of lightning and surge protection concepts is a risk analysis as per DIN EN 62305 Part 2 – risk management.

With this, the class of LPS is determined with which the risk potential of structures is assessed. Only on this basis can specific protection measures and protection components be selected – economically optimised and adapted to the type of use and building characteristics.

Try to anticipate the life cycle of the building. This might be an office to start with, but what if it is subsequently used for a different purpose? What if the rooms are later doctors' surgeries and thus open to the public?

This would mean a different class of LPS.

Think far ahead, because retrofitting is always cost-intensive.

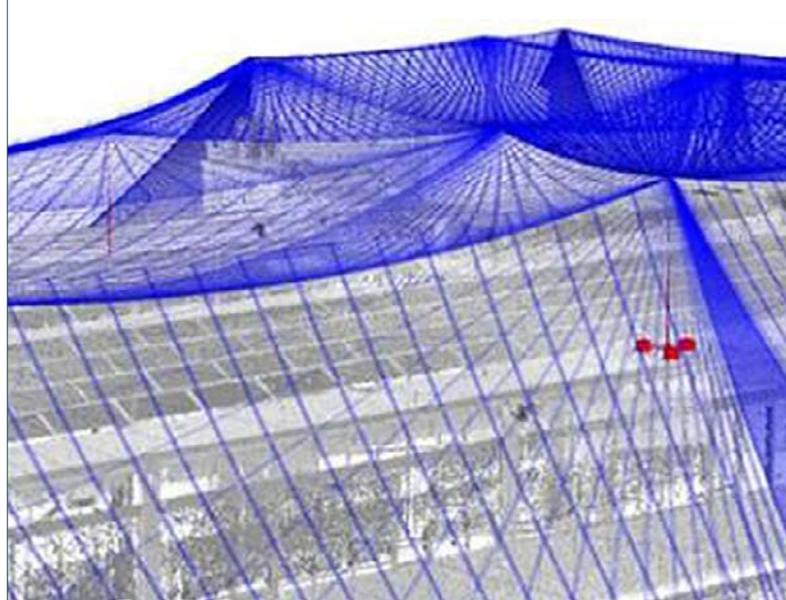
The planning service for the protection measures for your project is always based on the risk assessment.

## Service risk analysis

Have you already determined a class of LPS for your project? If so, our work will be based directly on this.

If you still do not have this for the buildings or installations in your project, we will gladly take on the risk analysis for you.





## 3D planning lightning protection

While a 2D plan can of course suffice for some building projects, it is more efficient to be able to observe the building on a monitor from all sides and from all angles. This way you get a precise basis for the positioning of the air-termination rods and down conductors in your building project. This is how you produce a well-founded lightning protection system nowadays.

Which 3D method is the right one for your project?

### Digitisation of installations by means of 3D simulation

- *Do you have detailed plans and models of your installations and buildings?*  
In this case, planning can be performed on CAD-based 3D models. By using the rolling sphere method, the air-termination rods are positioned precisely to produce a protected volume.

### Digitisation of existing buildings through laser scanning

- *Are you planning an annex but have no plans yet?*  
With 3D laser scanning, you quickly get a precise quantity survey of the existing installation.
- *Do you want to check the protected volume of an existing lightning protection system?*  
Produce digital plans using the laser scans for an authoritative basis.
- *Do you need information about areas of the premises that are difficult to access?*  
Laser scanning helps you monitor changes to the building.

## Why 3D planning with laser scanning?

For complex installations in particular, planning with a 3D program provides a highly precise basis for planning. With laser scanning, you now have a method for the digital recording of existing buildings which provides you with a detailed simulation of the object.

Millions of measuring points produce a 3D model on the basis of which all air-termination systems are precisely positioned. The protected volume is recorded in 360° – making things much easier, especially for difficult-to-access areas.

This way you calculate the exact material requirements for your project. Furthermore, the measuring method ensures an especially high planning quality, while simplifying archiving and documentation.

An additional advantage of laser scanning is demonstrated with extensions, annexes and modifications. The adjustments necessary to the lightning protection measures in these cases are able to be planned with particular ease.

Good to know: you can make as many 3D and 2D drawings as you want of a wide variety of views from each 3D model.

You are thus best equipped for all requirements.



# Planning the surge protection

Ever more expensive production technology and control and measuring systems are the rule. For effective system protection, a holistic approach is required. The external lightning protection system is therefore supplemented with a coordinated surge protection concept.

All power and data cables and conductors leading into the building from outside are taken into consideration here and protected accordingly.

## How it works

We discuss your project together on site and record all the relevant data. On this basis, the DEHNconcept team creates a tailored surge protection concept that takes account of all applicable standards.

## Advantages for you

You get a detailed protection concept for your specific project in the industry in question. Is this the protection of mobile telecommunication systems, battery storage systems,

hazardous areas, wind power stations, PV systems or charging stations? You can rest assured: within the large DEHN product portfolio, you will find just the right arrester for your special system application.

For purchasing, you will receive clear bills of materials and parts lists of all the required products.

The comprehensive documentation provides the best-possible basis for the installation team during the implementation phase. You also always have an overview of which arresters are installed where. This saves time on inspections and further plans involving modifications, extensions and refurbishments.

## Protect reliably and effectively

Let the DEHNconcept team produce a surge protection concept optimised for your project. This way you will protect an electrotechnical installation effectively from damage caused by lightning currents and surges.

# Reference projects

## Sonatrach Raffineria Italiana

The refinery spans an area of 1.9 km<sup>2</sup>. In order to implement effective protection against direct lightning strikes for a plant of this magnitude, profound planning is required.

During ongoing operations, the time-saving 3D laser scan method was therefore used. It offers a sound basis for the optimal positioning of the air-termination systems, as well as for the efficient planning of the installation work and material costs.



## ENERTRAG AG

The pilot project "Hybrid Power Plant Prenzlau" is the highest point in the largely flat terrain. As a result, the risk of a direct lightning strike is especially high. Ex zones throughout the inside of the hall require separate lightning protection, because conventional lightning protection will not suffice here.

The protection concept therefore consists of an air-termination system (HVI system) that is set up at a distance to and completely separated from the structure.



# Earthing simulation for transformer stations

## Step and touch voltages firmly under control

This is where people are at risk. Exposure to lightning or short-circuit currents inside a facility can cause fatal step and touch voltages.

So, take no risks when it comes to the subject of safety.

A correctly dimensioned earthing system, set up according to the specifications of the standards EN 50522 (VDE 0101-2), IEC 60479-1 (VDE V 0140-479-1) and IEC 62305 (VDE 0185-305), ensures a high degree of operational safety and the protection of people. It limits voltage to maximum permissible values, even in the event of a fault.

## Your services

The DEHNconcept team will create an earthing simulation for various scenarios, such as

- Lightning interference on transformer stations
- Short-circuit current interference on transformer stations for 16.7 and 50 Hz
- Short-circuit current interference and lightning interference on transformer stations

This will allow you to make concrete assertions about whether the defined earthing system offers sufficient safety. You now have a sound basis for the optimisation of your protection system.

## How it works

Step 1: you summarise the situation regarding your facility in a questionnaire.

Step 2: we perform the earthing simulation for you.

Step 3: you receive a detailed report.

## What you can expect

The results of the simulation graphically depict the safe/unsafe areas of your facility. They provide you with information on the influence of the disturbance variables in relation to earth potential rise and step and touch voltages.

## You obtain the following documents in PDF format for your planning:

- Detailed report on possible risk potential, including concrete proposals for preventing hazardous step and touch voltages.
- Detailed drawings of the earthing system and graphical depictions of the results.
- Bills of materials and tender specifications of the recommended materials

## Your benefits with DEHNconcept:

- Achieve safety in terms of step and touch voltages.
- Save time through professional planning support.
- Reduce costs by using earthing materials based on requirements.

## Wind energy – DolWin beta converter platform

The world's most powerful offshore converter platform with a transmission capacity of 916 megawatts is anchored to the floor of the North Sea through gravity alone.

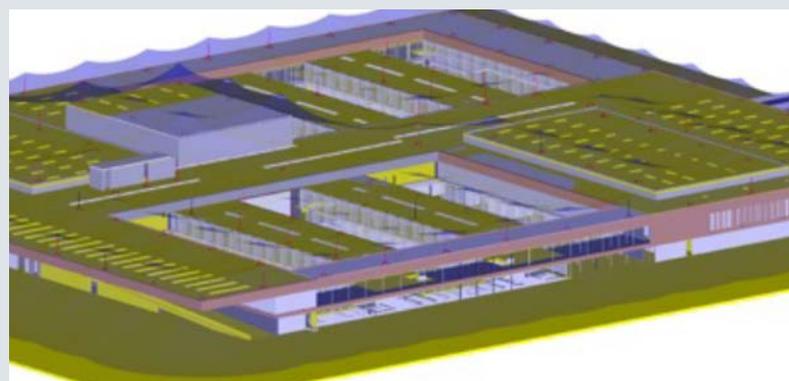
For lightning protection, conventional air-termination rods are used here, with the entire steel structure serving as a natural down conductor. The three-dimensional lightning protection plan was made based on a model supplied by the operator TenneT.



Source: TenneT

## TUM Campus in the Olympic Park Munich

This wooden building represents the new construction of the Sport and Health Sciences faculty at the Technical University of Munich (TUM). In the planning phase, the company bbs-project AG used the service of Concepts & Planning for the lightning protection system. A mixture of conventional and HVI lightning protection was employed specially for the wooden construction in order to optimally maintain the separation distances at critical points.



Surge Protection  
Lightning Protection / Earthing  
Safety Equipment  
DEHN protects.

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