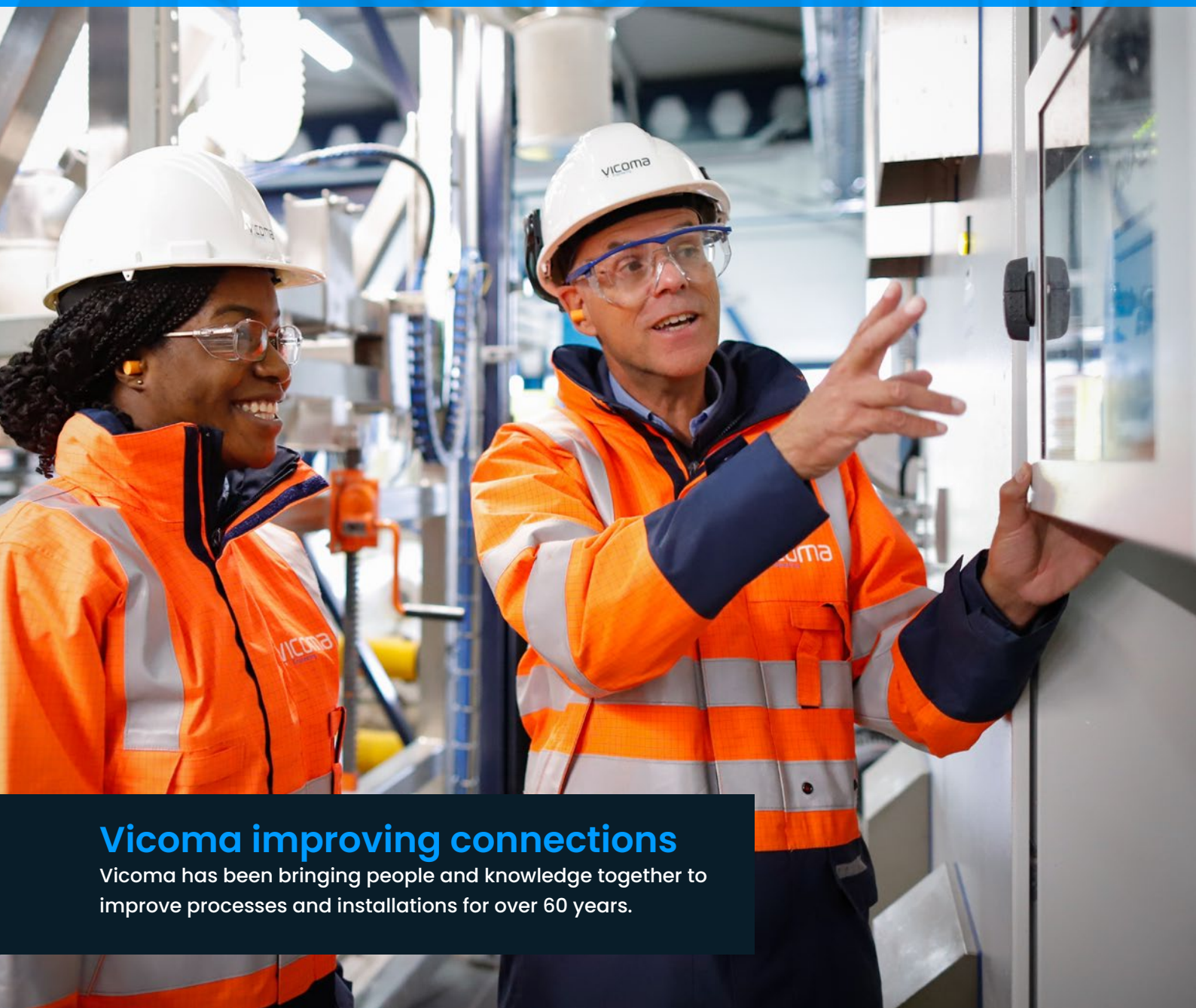
vicoma
Consultancy & Engineering

Safety first

Arc flash hazard analysis



Vicoma improving connections

Vicoma has been bringing people and knowledge together to improve processes and installations for over 60 years.

Safety first

Arc flash hazard analysis

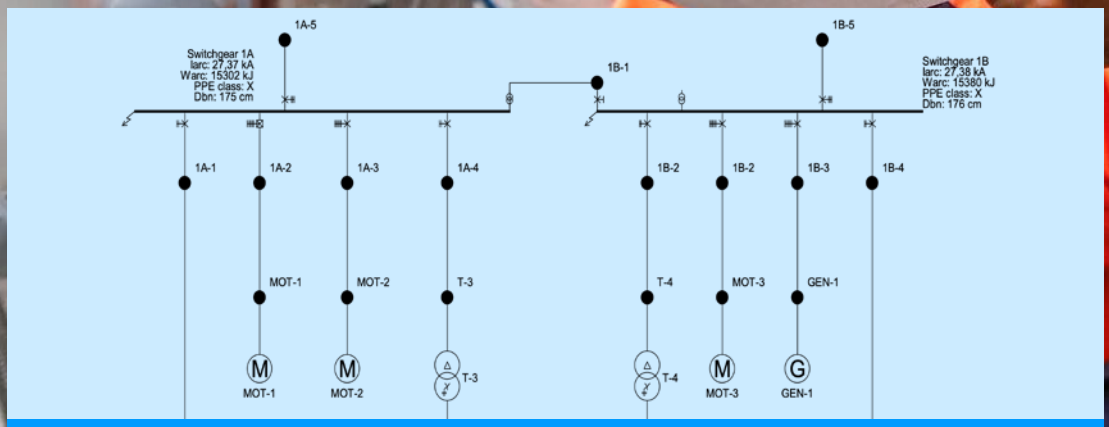
According to standards NEN 3140 and NEN 3840, the employer has an obligation to protect its employees from the dangers of electric arcs. Performing an *arc flash hazard analysis* is a first step in assessing the risks of arcs in the electrical installation. Vicoma has extensive expertise in this area and is happy to offer customers support.

What is an electric arc?

An electric arc occurs after a short circuit - for example due to faulty insulation - which causes electricity to jump between conductors. Air ionises, which then becomes conductive and creates a path for an even bigger electric arc, or arc flash. The whole process is very explosive, the blast causing pressure waves, a lot of heat, light and noise. The pressure waves disperse the hot air and the copper of the conductors, which vaporises from a solid state to gas.

Damage

An arc flash can cause a lot of property damage and serious personal injury. What's more, distributors are often unusable after an electric arc. After all, the arc blast release enormous heat that turns copper into a gaseous substance. The copper that settles inside the distributor afterwards causes the insulator to fail. This increases the risk of electricity jumping over, resulting in a new arc flash.



Analysis

An *arc flash hazard analysis* is an assessment of the risk of electric arcs that can potentially occur in an electrical installation. Doing this analysis enables owners of electrical plants to better understand the dangers of electric arcs and to take appropriate mitigating measures for the safety of their employees.

When performing *arc flash hazard analysis*, Vicoma maps the entire electrical plant and calculates short-circuit currents. We calculate the arc currents, the tripping times of the protective devices and the arc energy that is finally released.

Process steps

The process consists of the following steps:

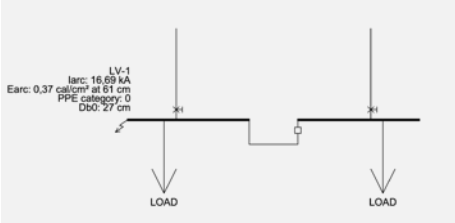
1. **Collection of data**
   The first step is to collect all the relevant system data, such as drawings, technical specifications, load data and security settings.

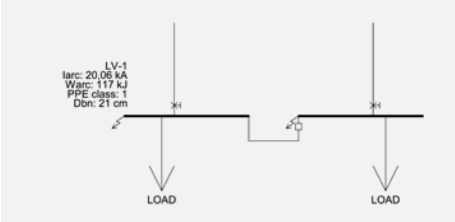
2. **Short circuit calculations**
   After this, we perform calculations to determine the short-circuit currents in the installation.

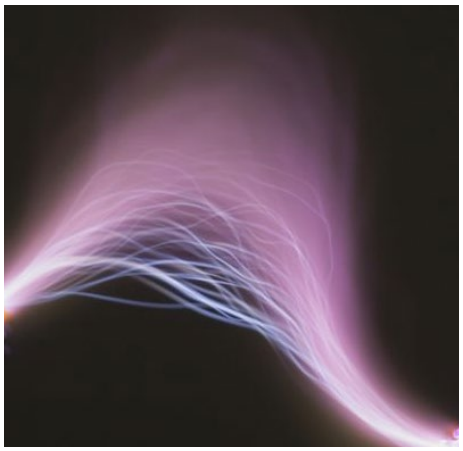
3. **Arc flash berekeningen**
   Based on the calculated *short circuit currents* (short circuit calculations), it's time to do the arc flash calculations in order to determine the potential energy that is released during an arc flash. This takes into account electrical parameters such as the current, voltage, time, and the distance from the worker. The result of these calculations is the incident energy, expressed in kilojoules per square metre (kJ/m²).

4. **Classification of PPE**
   Based on the calculated incident energy, we can decide on which personal protective equipment (PPE) is required: the appropriate classification of protective clothing, face protection, gloves and other PPE needed to protect workers from the thermal effects of an arc flash.

5. **Reporting and recommendations**
   All results of the analysis are summarised in a report. The report contains the identified risks, calculated incident energies and recommended safety precautions. We also make recommendations for upgrading protection devices, implementing safety procedures and training personnel.







Vision software

Vicoma uses Vision software to calculate both the arc currents and the thermal energy that is released in an electric arc. Calculations are made according to the ISSA (European) standard or according to IEEE 1584 (American). The IEEE 1584 is mainly used in the Netherlands by companies that operate mainly in or for the US market, as the PPE classes are determined according to US standards.

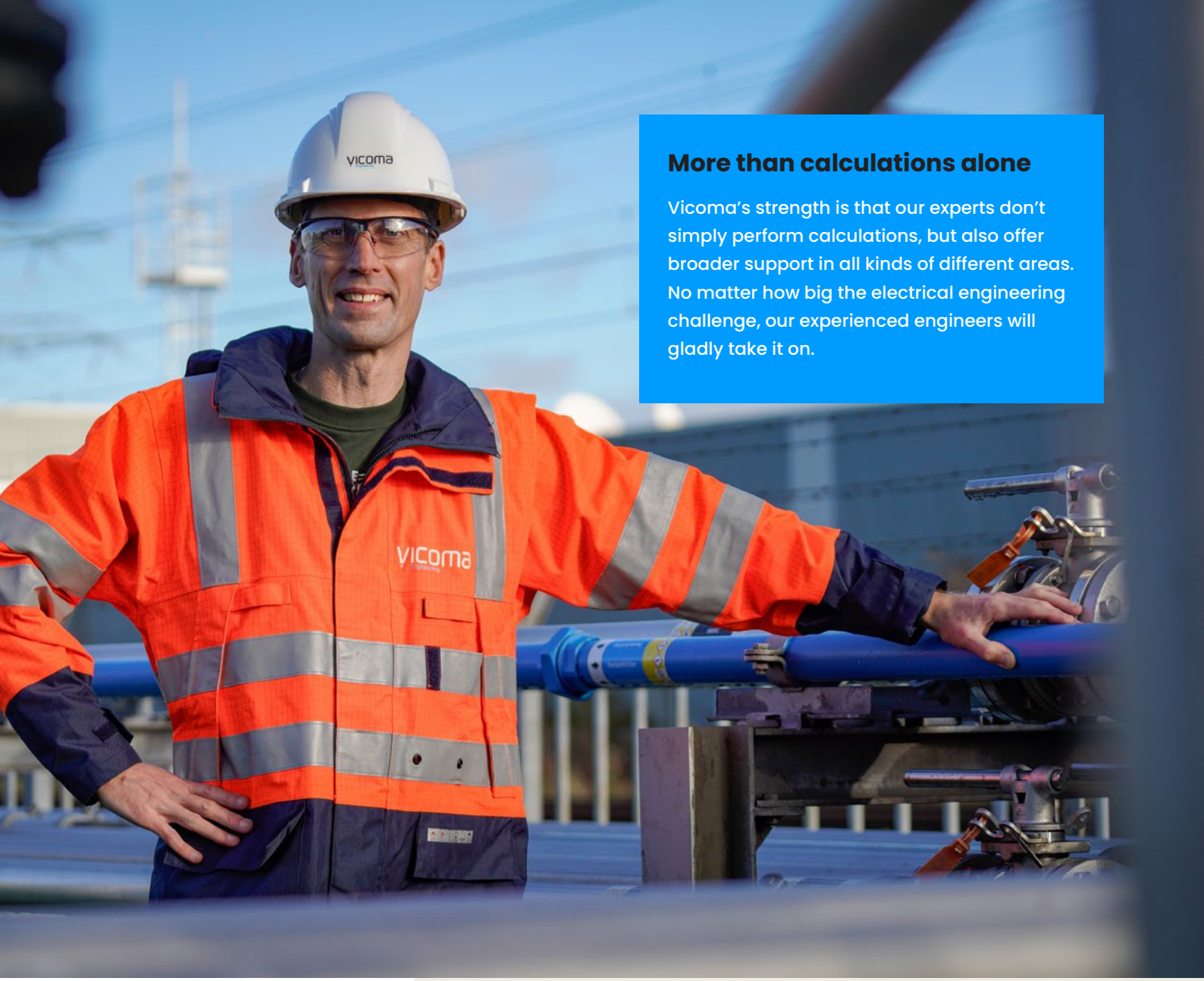
Solutions

Does the *arc flash hazard analysis* show that the arc energy is too high to operate the existing on-site electrical system? No problem. There are various methods to reduce the arc energy to a safe level. The most efficient method is rapid and efficient shut-down of the arc. We provide advice on the best way to achieve this in the existing system. In addition, we can perform a selectivity study to determine which parts of the system can be protected by changing the settings of the existing safeguards.

If this can't be achieved, we can investigate which alternatives can work, make a concept design and determine the CAPEX of the required modifications. System modifications can be extensive. We can also provide you with professional support in prioritising and creating a roadmap to implement the measures.

Professionally trained staff

Having properly trained personnel who understand the risks of arc flash incidents is crucial. Employees need to know how to act when an arc occurs. Implementing safety procedures and training employees regularly leads to greater awareness of the risks and the measures that are needed to minimise the arc energy. We can assist companies in drawing up clear safety procedures and advise on the right training for employees.



More than calculations alone

Vicoma's strength is that our experts don't simply perform calculations, but also offer broader support in all kinds of different areas. No matter how big the electrical engineering challenge, our experienced engineers will gladly take it on.

vicoma
Consultancy & Engineering

An innovative, flexible, and independent Consultancy & Engineering firm

Our consultancy and engineering firm has been working for 60 years with a wide array of clients on single and multidisciplinary projects. What can you expect from us? A pragmatic and flexible approach.

Our engineers are capable of overseeing diverse projects from start to finish, handling the engineering aspect efficiently. We also operate swiftly with flexible teams and streamlined communication channels. Being an independent family-owned business, it's inherent for us to prioritize your interests alone. As such, we are not publicly listed and are not tied to specific contractors.

Vicoma Sales
Middenbaan Noord 210
3191 EL Rotterdam
Mailbox 63, 3190 AB Hoogvliet
Netherlands

Call us:
+31 (0) 10 416 00 11

Email us:
info@vicoma.com

www.vicoma.com

We serve 150+ customers in 5 locations in the Netherlands and India.