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This Time in Focus:

Risk Assessment

Machinery Safety Risk Assessment

The topic of safety of machinery, also known as "safety", addresses the protection of people against machines. Specifically, against potential hazards posed by the operation of machines. The requirements for a machinery safety risk assessment are described in the EC Machinery Directive. According to the directive, a risk assessment begins with the design of the machine. Manufacturers have an obligation to consider both further findings gained during manufacturing and field information from past projects.

As a first step, the limits of the machine must be identified. The limits of the machine are not only determined by its weight, dimensions, and materials used, but in particular by the persons present in the surroundings of the machine. The surroundings are not only relevant during normal operation, but also when maintenance work is being carried out; different hazard potentials have to be considered. Additionally, the users' personal training, experience, and skills have to be taken into account. The second step is to identify hazards posed by the machine. Then, the hazards are evaluated using certain factors. This is helpful for users when deciding whether risk reduction measures are required. Finally, necessary protective measures are defined. Useful guidance can be found in EN ISO 12100.

To ensure a structured risk assessment procedure, using a detailed list in tabular form is recommended. The risk assessment is used by the machine manufacturer as legal proof that the requirements of the Machinery Directive have been met. The risk assessment ends when the machine is implemented, that is, built.

Risk Analysis for Industrial Security

The term "security" describes the protection of machines against unauthorized access by people. Machine manufacturers are under no legal obligation to carry out such a risk analysis. Exceptions may contractually be agreed on with the operator.

Any risk analysis begins with the development of the automation concept. The risk analysis must be continuously verified because the threat situation and the effectiveness of the implemented measures are constantly changing. The IEC 62443 standard is a helpful document for those carrying out a risk analysis.
First of all, a threat analysis is performed. It is done to identify relevant threats in the industrial environment. The BSI (German Federal Office for Information Security) provides a document called "Industrial Control System Security – Top 10 Threats and Countermeasures", which may serve as a useful template. The risk assessment is used to estimate possible effects and damage caused by the identified threats as well as their probability of occurrence. The probability of occurrence is calculated from various individual parameters and pieces of context information, such as the complexity of the possible attack or the access rights of the potential attacker. From a business perspective, there are several different options for handling the identified risks: risk avoidance, risk reduction, risk transfer, and risk acceptance.

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