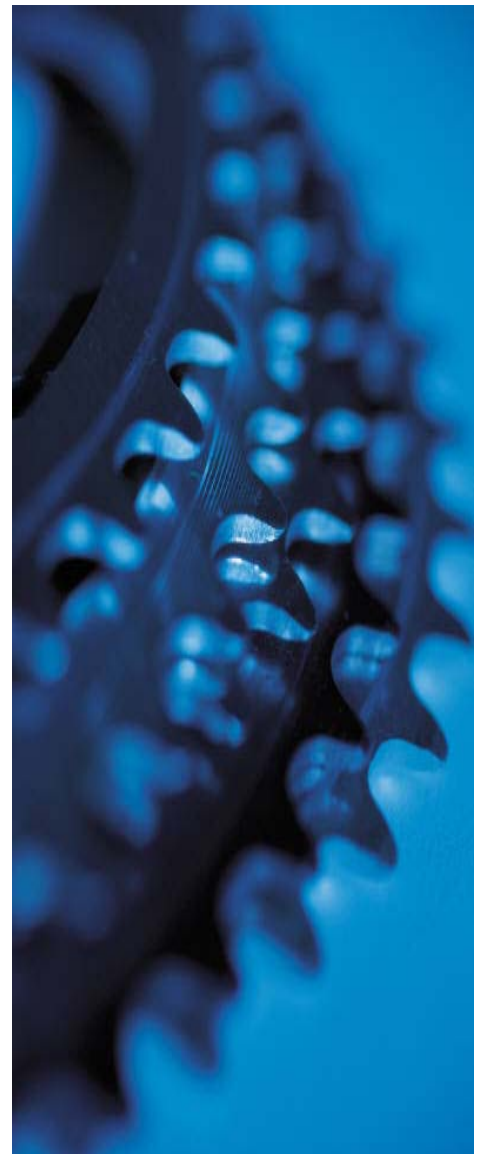


Machine Safeguarding

Kenexis assists organizations that employ industrial machinery to reduce risk of injury and increase uptime and profitability. We do this by assisting in the systematic assessment of the risks posed by their machines and machine safeguards that meet regulatory requirements, are both cost effective, and improve operability. The industries we serve range from chemical and pharmaceutical manufacturers through the more traditional heavy machine users such as automotive manufacturing.

Data from the National Institute for Occupational Safety and Health (NIOSH) indicates that more than that 150 people die every year from being caught in, crushed by, or otherwise fatally injured from hazardous contact on the job with heavy machinery. Between 1980 and 1995, machine related injuries were the second leading cause of occupational fatalities¹. Many of these injuries can be attributed to failure to follow a lifecycle approach to safety that includes the identification of hazards, assessment of risk, selection of appropriate safeguards, verification of design specification, validation testing and continual quality assurance through management of change, testing and maintenance. The Kenexis Machine Safeguarding Solution™ provides a systematic process to meet the regulatory requirements for machine safeguarding and achieve your plant's safety goals. Our process ensures that your machine safeguarding program benchmarks well with your industrial peers and is done in accordance with industrial recognized and generally accepted engineering practices, such as the ANSI B11 series and NFPA 79.



¹Information from the NIOSH Publication, *Worker Health Chartbook, 2000*

Lifecycle Approach to Safety

Our lifecycle approach is a key to ensuring effective machine safety. This process starts at conceptual design and continues through the design of machine safeguards all the way through plant startup and ongoing change management.

Services

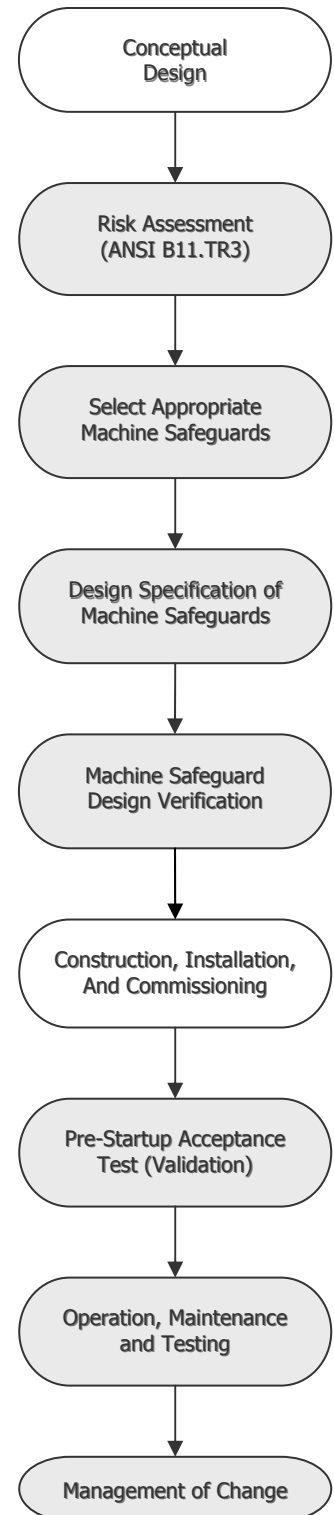
We provide a range of services that are geared toward identifying the risks posed by machines and then assisting in the implementation of protective measures to control those risks.

Risk Assessment—The most important and unfortunately most ignored step in the safety lifecycle is risk assessment. By applying risk assessment techniques such as those described in ANSI B11.TR3, with the assistance of our state-of-the-art computer tool kits, we help to ensure that potential hazards of a machine are identified. Our thorough process reviews each step of each task performed on a machine, whether normal operation or non-routine maintenance, to ensure a comprehensive analysis. For all identified hazards, the existing safeguards are reviewed to determine if regulatory requirements for machine safeguarding are met and if the residual risk is tolerable. Where required, recommendations for improved or additional safeguards are provided.

Safeguard Selection—There are a large number of options available for machine safeguarding, ranging from computer controlled electronic safeguards to simple physical barriers. Kenexis can assist in the task of selecting the most appropriate safeguard. This selection is based on requirements such as speed, safety time, machine dimensions, environmental conditions (dust, oil mist, light, etc.), amount of operational and maintenance activity in the guarded area, and the preferences of the end user. Our selection process yields the most cost-effective safeguard that is appropriate for the situation.

Design Verification—Kenexis is an independent consulting firm that is not involved in detailed engineering or equipment selection/procurement. As a result, we can provide a professional, unbiased third party verification of the appropriateness of the design of safeguards. We verify designs using a proprietary checklist approach that compares engineering drawings including safeguard circuit diagrams, and safeguard physical layout drawings against the requirements specified for them during the risk assessment phase to ensure the dimensions, selected equipment, programming, and wiring practices meets design specifications and relevant standards.

Validation—The final step prior to startup is a physical validation test to ensure proper operation of the safeguards. This step includes actual physical testing and detailed measurement of the layout of the actual installed equipment to ensure all relevant standards requirements and design specifications are met by the installed system.



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