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Safety and Risk Standards & Regulations for Robot Machine Tending



Robotic Machine Tending Safety and Risk Standards & Regulations

Safety and risk assessments are essential when implementing robotic machine tending installations to protect both factory personnel and equipment as well as avoid potential liability.

These assessments evaluate potential hazards associated with robotic operations, such as moving parts, high-speed equipment, and unexpected stops or starts. In CNC robotic machine tending, risks can stem from the robot's movements, the CNC machine's operation, or both, which may pose risks of entrapment, collision, pinch points, or other dangerous situations. Safety measures are crucial to mitigate these hazards and ensure safe operation and can include emergency stops, interlocked barriers, light curtains, and safety-rated robots and machine controllers.

A thorough risk assessment identifies specific dangers in the installation layout, robot reach, and interaction points between the robot and CNC machine. It also evaluates the potential for human interaction, especially in collaborative robot (cobot) setups. Cobots often work near humans, so they are designed with safety features such as force and speed limitations, however the work environment must still be carefully reviewed. When risks are identified, controls like reduced robot speed, protective guarding, or programming adjustments can be implemented.

Regular training for operators on safety procedures, combined with scheduled maintenance checks, are also vital. By conducting a comprehensive risk assessment, manufacturers can create a safer CNC robotic machine tending environment that complies with industry safety standards, minimizes downtime due to safety incidents, and fosters a culture of safety within the facility.

Flexxbotics provides comprehensive safety mitigation as part of installation designs and offers both safety and risk assessments as an optional service for installations of the Flexxbotics solution.

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Regulations & Standards for Safety and Risk

Flexxbotics recommends and uses the following regulations and standards to minimize risks and ensure safe working environments for employees interacting with robots and machinery in CNC robotic machine tending:

ANSI Standards:

ANSI B11.0: Establishes guidelines for designing and safe operation of manufacturing machinery, emphasizing hazard elimination and risk reduction.

ANSI/RIA R15.06: Specifies safety requirements for industrial robots, cobots, and robotic systems, ensuring safe design, installation, and operation.

ANSI/RIA TR R15.306: Provides guidelines for task-based risk assessment in industrial robot systems, promoting safer robotic operation in the workplace.

ANSI/RIA TR R15.406: Identifies guidelines for implementing physical safeguarding measures during the integration of industrial robot systems to enhance operator safety.

ISO Standards:

EN ISO 12100: Provides general principles for designing safe machinery installations, focusing on risk assessment and reduction.

EN ISO 10218-1: Specifies safety requirements for industrial robots and cobots, covering design, implementation, and testing.

EN ISO 10218-2: Addresses safety requirements for robot systems, including installation, operation, and maintenance.

ISO/TS 15066: Provides guidelines for collaborative robot (cobot) design, ensuring safe human-robot interaction.

OSHA Regulations:

CFR 1910 Subpart O, Machine Guarding: Requires employers to safeguard machinery to prevent employee injuries from hazardous mechanical components.

About Flexxbotics

Flexxbotics enables robot-driven manufacturing at scale. Flexxbotics solution digitalizes robotic production with autonomous process control for next generation smart factory environments. Flexxbotics breakthrough, the unique FlexxCORE[™] technology, seamlessly connects and coordinates robots with existing automation equipment, IT systems and people. More powerful, flexible and open, Flexxbotics revolutionizes the use of robotics in complex production.

Visit <u>www.flexxbotics.com</u> to learn more and follow us on <u>LinkedIn</u>.