**Workplace Safety and Robots: NIOSH Develops Program to Study Robot-Related Injuries**

With the increased use in robotic technology, NIOSH has been looking into the safety impact of working alongside these machines. While robots can help reduce workplace injuries by replacing workers in some types of hazardous work conditions, the use of robots may create their own set of hazards.

The National Institute for Occupational Safety and Health (NIOSH) has a Center for Occupational Robotics Research, and more specifically, a special program called the Fatality Assessment and Control Evaluation (FACE) Program. Through the FACE program, NIOSH is conducting surveillance, targeted investigations, and prevention activities. The program is conducting in-depth investigations of robot-related deaths. The FACE program is currently operated in 7 states through local state health or labor agencies.

Recently the Washington State FACE Program issued recommendations for safety actions for two separate types of robots: laser guided vehicles and remote controlled demolition machines.

**Laser Guided Vehicles**

In one case, NIOSH investigated a death at a water bottling company where a worker was crushed. At the facility, each vehicle had safety sensors to detect objects or workers in the vehicle’s path. An alarm would sound when an obstruction was present, and the vehicles would stop moving until the obstruction was removed.

The worker heard an alarm sound on one of the vehicles indicating sensors detected an object in its path. He attempted to remove a piece of plastic that likely tore off of a pallet. Before removing the plastic and reaching under the forks, the worker had not cut the power to the machine. He also had not heeded label warnings to stay clear of the forks. Investigators believe that when he removed the plastic obstruction, he was positioned outside the path of the sensor. The vehicle resumed operation, the forks came down, and the worker was crushed.

**FACE recommends the following safety practices to prevent injury from laser guided vehicles:**

* Incorporate manufacturer safety requirements into written company safety procedures for automated guided industrial vehicles;
* Train workers about the specific hazards and safety requirements associated with automated guided industrial vehicles; and,
* Emphasize workers are expected to follow required safety procedures every time, and ensure compliance through periodic refresher training and spot checks.

**Demolition Robots**

FACE investigated two cases where workers were severely injured by demolition robots. In the first case, a worker was using a machine that had a wire connected to a remote control the worker wore on his waist. When the worker attempted to move the machine’s power cable, he bumped the remote control against the machine, pinning him between the machine and the wall.

In another case, a worker broke his foot when operating a machine to chip concrete. He was in a tight spot between an excavation wall and the machine. When he tried to apply more force on the machine to chip the concrete, the machine shifted and the outrigger came down on his foot.

**As a result, FACE has developed recommendations for demolition robots:**

* Prepare a job hazard analysis with operators for each new job to identify and control hazards. Use the manufacturer’s safety instructions to establish the risk zone for the specific machine, attachment, and task;
* Always stay outside the risk zone when the machine is in operation, and do not enter until the machine is put into emergency stop mode or de-energized;
* Consider using a proximity warning system, such as those based on radio frequency identification (RFID), to maintain a safe worker-to-machine distance;
* Train operators to manage power cables and to continually monitor the process for hazards and redefine the risk zone;
* Ensure operators always read and follow manufacturer’s provided safety instructions; and,
* Consider using a spotter to assist the operator.

**NIOSH is Looking for Case Studies**

NIOSH’s Center for Occupational Robotics Research, and its FACE programs are looking for other instances where robotics technology has contributed to injuries. Through their research, they hope to develop additional safety programs and guidance to help companies keep workers safe. If you know of a related incident, NIOSH would like to hear from you for an anonymous investigation. You can find more about them at <https://www.cdc.gov/niosh/topics/robotics/aboutthecenter.html>.