

# Industrial Robot Safety – Know the Laws of Your Province



**Only 6 jurisdictions have adopted OHS regulations specifically covering robot safety.**

Despite their widespread use and the dangers they pose, only 6 provinces and territories include specific safety requirements for robots and industrial robot systems in their OHS regulations. Among these, Saskatchewan, Manitoba, the Northwest Territories and Nunavut are the most detailed. Here's a summary of the general and eye/face PPE requirements in each part of Canada. While BC and Alberta have also adopted robot safety regulations, their rules are fairly general. Here's a rundown of OHS industrial robot safety regulation in each part of Canada.

## OHS Robot & Robot System Safety Requirements

### FEDERAL

*COHS Regulations* don't expressly address industrial robots

### ALBERTA

(1) Employer must ensure that industrial robot system design, construction, installation, testing, start up, operation and maintenance meets CSA Z434 03 (R2008), *Industrial Robots and Robot Systems ' General Safety Requirements*; and  
(2) If a worker is teaching a robot, employer must ensure that: (a) only the worker teaching the robot is allowed to enter the restricted work envelope; (b) the robot system is under the sole control of the worker teaching the robot; (c) if the robot is under drive power, it operates at slow speed only or at a speed that's deliberately selected and maintained by the worker teaching the robot; (d) the robot can't respond to a remote interlock or signal that would activate the robot, and (e) the worker is outside the restricted work envelope before the robot is returned to automatic operation (*OHS Code*, Secs. 384 and 385)

## **BRITISH COLUMBIA**

Industrial robot or robot system must be installed, safeguarded, maintained, tested and started, used, programmed and workers trained to meet the requirements of: (a) CSA-Z434-94, *Industrial Robots and Robot Systems ' General Safety Requirements*, or (b) ANSI/RIA R15.06-1992, *American National Standard Industrial Robots and Robot Systems – Safety Requirements*, (OHS Reg., Sec. 12.83)

## **MANITOBA**

(1) Robot safety requirements apply to every workplace where a robot or robot system is used but not to: (a) a personal or mobile robot; (b) an automatic guided vehicle system; (c) an automated storage and retrieval system; or (d) a numerically controlled machine; (2) Employer must: (a) develop and implement safe work procedures for installation, operation, use, teaching and maintenance of robots and robot systems used in the workplace; (b) train workers in the safe work procedures; and (c) ensure that workers comply with the safe work procedures; (3) Employer must ensure that every robot and robot system in the workplace: (a) meets CSA-Z434-03, *Industrial Robots and Robot Systems ' General Safety Requirements*; and (b) is installed, anchored, wired and used in accordance with the manufacturer's specifications; (4) Employer must ensure that every robot and robot system in the workplace has safeguards to prevent a worker from entering the restricted work envelope while the robot or robot system is in motion; (5) Employer must ensure that when a safeguard is removed or made ineffective to permit maintenance, repair, testing, teaching or adjustment, the safeguard is replaced or made effective before a worker uses the robot or robot system again; (6) Employer must ensure that the primary controls of a robot or robot system, including a restart control: (a) are located outside the restricted work envelope; (b) are arranged so that the robot or robot system is clearly visible to the worker operating the primary controls; and (c) can't be activated inadvertently; and (7) Employer must ensure that a worker operating a robot or robot system is provided with a readily accessible emergency stop device (*WSH Regs.*, Secs. 16.29 to 16.33)

## **NEW BRUNSWICK**

OHS regulations don't expressly address industrial robots

## **NEWFOUNDLAND**

OHS regulations don't expressly address industrial robots

## **NOVA SCOTIA**

OHS regulations don't expressly address industrial robots

## **ONTARIO**

OHS regulations don't expressly address industrial robots

## PRINCE EDWARD ISLAND

OHS regulations don't expressly address industrial robots

## QUÉBEC

OHS regulations don't expressly address industrial robots

## SASKATCHEWAN

(1) OHS robot requirements apply to the installation, operation, teaching and maintenance of robots and robot systems, but not personal robots, automatic guided vehicle systems, automated storage and retrieval systems, automatic conveyor and shuttle systems, mobile robots or numerically controlled machine tools; (2) Employer, in consultation with the JHSC or safety representative (or the workers if there is no JHSC or safety rep for the workplace), must: (a) assess the potential hazards to a worker who's required or permitted to install, operate, teach or maintain a robot or robot system at the workplace; and (b) develop written safe work practices and procedures for installation, operation, teaching and maintenance of robots and robot systems; (3) Employer must ensure that workers are trained in and implement the above safe work practices and procedures; (4) Employer must ensure that robots and robot systems are: (a) installed, anchored and wired in accordance with the manufacturer's recommendations and specifications; and (b) compatible with conditions in the workplace environment, including temperature, humidity, corrosive conditions, dust, electromagnetic interference or radiofrequency interference and other conditions that could affect the safe operation or control of the robot or robot system; (5) Employer must ensure that every robot and robot system is equipped with safeguards: (a) to prevent a worker from entering the restricted work envelope while the robot or robot system is in motion; or (b) to inhibit robot motion while any part of a worker's body is within the restricted work envelope while the robot or robot system is in motion; (6) The safeguards required by subsection (5): (a) **may include** interlock barriers, limiting devices and presence-sensing devices; and (b) **must include** clearly visible line markings on the floor on which the robot or robot system is mounted to identify the restricted work envelope; (7) Employer must ensure that a robot's primary controls, including a restart control: (a) are located outside the restricted work envelope; (b) are arranged so that the robot and robot system are clearly visible to the worker who operates the primary controls; and (c) can't be activated inadvertently; (8) If a worker is required or permitted to enter the restricted work envelope, employer must ensure that the robot's motion can't be initiated by any person other than the worker within the restricted work envelope using a pendant; (9) Employer must ensure that a worker who operates a robot or robot system is provided with a readily accessible emergency stop device; (10) Employer must ensure that the controls of a robot provide a slow speed option; (11) Before a worker does maintenance or repair of a robot or robot system, employer must ensure that: (a) the robot or robot system is locked out and remains locked out during that activity; or (b) an equally effective procedure is used to protect the worker; and (12) If a worker is required or permitted to teach a robot, employer must ensure that: (a) only the worker teaching the robot is allowed to enter the restricted work envelope; (b) the robot system is under the sole control of the worker teaching the robot; (c) when the robot is under drive power, it operates at slow speed only or at a

speed that's deliberately selected and maintained by the worker teaching the robot; (d) the robot won't respond to a remote interlock or signal that would activate it; and (e) the worker leaves the restricted work envelope before returning the robot to automatic operation (*OHS Regs.*, Part XV)

## NORTHWEST TERRITORIES & NUNAVUT

(1) OHS robot requirements apply to the installation, operation, teaching and maintenance of robot systems, but not to personal robots, automatic guided vehicle systems, automated storage and retrieval systems, automatic conveyor and shuttle systems, mobile robots or numerically controlled machine tools; (2) Employer must, in consultation with the workplace JHSC or safety rep or, if there is no JHSC or safety rep, the workers: (a) assess potential hazards to a worker required or permitted to install, operate, teach or maintain a robot or robot system at a work site; and (b) develop written safe work practices and procedures for installation, operation, teaching and maintenance of robots and robot systems; (3) Employer must ensure that workers are trained in and implement the above safe work practices and procedures; (4) Employer must ensure that robots and robot systems are: (a) installed, anchored and wired in accordance with the manufacturer's specifications; and (b) compatible with conditions at the work site, including temperature, humidity, corrosive conditions, dust, electromagnetic interference or radio frequency interference and other conditions that could affect safe operation or control; (5) Employer must ensure that each robot and robot system is equipped with safeguards to: (a) prevent a worker from entering the restricted work envelope while the robot or robot system is in motion; or (b) inhibit robot motion while a part of a worker's body is within the restricted work envelope while the robot or robot system is in motion; (6) The safeguards required by subsection (5): (a) **may include** interlock barriers, limiting devices and presence sensing devices; and (b) **must include** clearly visible line markings on the floor on which the robot or robot system is mounted to identify the restricted work envelope; (7) Employer must ensure that a robot's primary controls, including a restart control: (a) are located outside the restricted work envelope; (b) are arranged so that the robot and robot system are clearly visible to the worker who operates the primary controls; and (c) can't be activated inadvertently; (8) If a worker is required or permitted to enter a restricted work envelope, employer must ensure that the robot's motion can't be initiated by an individual other than the worker using a pendant within the restricted work envelope; (9) Employer must ensure that a worker who operates a robot or robot system is provided with a readily accessible emergency stop device; (10) Employer must ensure that the controls of a robot provide a slow speed option; (11) Employer must ensure that, before a worker does maintenance or repair of a robot or robot system: (a) the robot or robot system is locked out and remains locked out during that activity; or (b) a procedure equally as effective is implemented to protect the worker; and (12) If a worker is required or permitted to teach a robot, employer must ensure that: (a) only the worker teaching the robot is required or permitted to enter the restricted work envelope; (b) the robot system is under the sole control of the worker teaching the robot; (c) when the robot is under drive power, it operates at slow speed only or a speed deliberately selected and maintained by the worker teaching the robot; (d) the robot won't respond to a remote interlock or signal that would activate it; and (e) the worker leaves the restricted work envelope before returning the robot to automatic operation (*OHS Regs.*, Part 15)

## **YUKON**

OHS regulations don't expressly address industrial robots