MACHINERY & EQUIPMENT: 5 Key Elements of Compliance with Conveyor Requirements

Conveyors are used in many workplaces to move materials, products, parts, etc. from one place to another. But as useful as conveyors are, they also pose various safety hazards. For example, workers can get caught in the moving belt or in pinch points. And materials can fall off the belt and strike workers. So the OHS regulations typically impose specific safety requirements on conveyors in addition to the other requirements that apply to all machinery and equipment, such as lockout/tagout rules. Here's a look at the five key elements of compliance with the specific requirements for conveyors.

Defining Our Terms

In this article, we'll discuss the requirements for conveyors in general, not those that apply to only certain industries, such as mining. In addition, note that the article will cover the requirements specific to conveyors only'not basic requirements that may apply to conveyors as well as other types of equipment and machinery.

5 KEY COMPLIANCE ELEMENTS

Each jurisdiction's OHS regulations include specific requirements for conveyors and conveyor belts. (See this chart for the requirements in each jurisdiction.) In some

jurisdictions, such as BC, NB, NS and PE, these requirements are fairly extensive; in others, the requirements address just a few conveyor-specific issues. In any event, you should always consult and comply with the requirements in your jurisdiction's OHS laws. However, an OHS program that covers these five key elements is likely to comply with the conveyor requirements across Canada:

1. **Design Requirements**

Conveyors must be properly designed and constructed to ensure their safe use. So the OHS regulations often require such equipment to comply with a designated standard, usually ASME B20.1, Safety Standard for Conveyors and Related Equipment (version 1993 or 2000).

The OHS regulations may also include additional design requirements. For example, Sec. 255(1) of New Brunswick's OHS regulations says that a conveyor must be constructed and installed so that:

- There's sufficient clearance between the material transported and any fixed or moving object;
- Shearing points between moving and stationary parts are avoided; and
- The conveyor isn't able to feed onto a stopped conveyor [Sec. 255(1)].

2. **Guarding**

The OHS regulations usually include two types of guarding requirements for conveyors:

To protect workers from pinch points/nip hazards. Workers can get caught in parts of a conveyor such as spools, pulleys, rollers, etc. and seriously injured. For example, a 25-year-old worker in the U.K. was sorting clothes hangers on a conveyor when her scarf and hair got caught in the chain and sprocket drive of the belt as she bent over to remove

accumulated hangers. She sustained serious throat injuries, lost a substantial part of her hair and broke a finger. She needed several operations and was in the hospital for three months.

Because of these pinch points or nip hazards, the basic guarding requirements for machinery and equipment likely apply to conveyors. But some jurisdictions have conveyor-specific guarding requirements as well. For example, under BC's OHS laws, a belt conveyor must have accessible nip points of spools and pulleys guarded to prevent contact by a worker and the moving parts of a screw-type conveyor must also be guarded from contact by a worker.

In some circumstances, hazardous areas can't be guarded because of the work process'that is, guards would prevent workers from doing their jobs. In that event, the OHS regulations typically state that workers must be given and required to use suitable tools or devices to prevent them from coming into contact with moving parts of the conveyor.

To prevent materials from falling off the conveyor. The other hazard guarding is intended to address is the risk of materials falling off the conveyor and striking a worker. In general, a conveyor must have either high side walls, sheet metal, guardrails, screen guards, sideboards or other guards to prevent materials from falling off of it if:

- It's an elevated conveyor that passes over a walkway or a place where a worker may pass or work; or
- Falling material presents a hazard to workers.

3. **Emergency Stopping System**

In most jurisdictions, a conveyor must have an emergency stopping system, unless guarding prevents access to the conveyor and possible contact with the moving parts. This system should be designed and installed so that it activates if a worker falls onto the conveyor or if a fallen worker on

the conveyor moves an arm or leg off to one side of the conveyor. If the system uses a pull wire or pull cords, you should ensure that the wires or cords are clearly visible and readily accessible at the operator's normal control station and at other appropriate points along the run of conveyor, including designated work stations, loading and unloading stations, and drive and take up sections. Such a system should be activated when:

- The pull wire or cord is pulled in any direction;
- The wire or cord breaks; or
- A single spring in the assembly fails.

After an emergency stop, the conveyor must not be restarted until an inspection has determined it can be operated safely. And even then, manual resetting should be required before the conveyor can be restarted.

***Insider* Says:** As an alternative to an emergency stopping system, some jurisdictions permit workers to wear safety-belts or other effective means of restraint to prevent them from falling onto the conveyor.

4. **Crossing Over or Under Conveyors**

If a conveyor is elevated, workers may need to cross underneath it and so would be at risk of being struck by materials falling off the conveyor. And if a conveyor isn't elevated, workers may need to cross over it and thus at risk of falling onto the moving conveyor. Most OHS regulations address both of these circumstances and their related risks.

If an elevated conveyor passes over a walkway or an area where workers may work or pass, as discussed above, the conveyor should have guards or other measures to prevent materials from falling from it. In addition, an elevated conveyor may need to run in a trough that's strong enough to carry the weight of a broken chain, rope, belt or other material that falls from the conveyor. Plus, if workers need to access an elevated

conveyor, it should have walkways that have appropriate guardrails.

If workers need to cross over conveyors, there should be adequate crossing facilities, such as bridges, provided for them to use to do so. These bridges should typically be at least one metre wide and have adequate guardrails.

***Insider* Says:** Even if a conveyor isn't elevated, workers may still need to go under it, say, to retrieve a dropped item. For that reason, it's important that any pinch points accessible *under* the conveyor are properly guarded. For example, a warehouse worker went underneath a conveyor to plug in a scale. She was injured when her hair got entangled in an unguarded drive shaft. As a result, the employer was convicted of an OHS violation and fined $80,000 [*R. v. Value Drug Mart Associates Ltd.*, [2014] ABPC 255 (CanLII), Nov. 12, 2014].

5. **Safe Work Rules**

As with any piece of machinery or equipment, you should set safe work rules for the operation of conveyors (and train workers on them). Those rules should, at a minimum:

- Bar workers from standing on the supporting frame of a conveyor while loading or unloading the conveyor or when clearing blockages *unless* the conveyor is stopped and has been locked out;
- Prohibit workers from riding on a conveyor (unless the conveyor is specifically designed and used to transport people);
- Require workers to remove heavy or bulky articles by hand from a moving conveyor at designated stations only;
- Require workers to cross under a moving conveyor belt only at a walkway or other designated place where they're protected from the conveyor's moving parts and from material falling from the belt;
- Require workers to use a walkway or bridge to cross over

a conveyor if the belt is moving or is motionless but hasn’t been locked out; and
- Allow workers to cross over a conveyor at a location other than a bridge if the belt has been locked out.

BOTTOM LINE

Failing to comply with the requirements in the OHS regulations for conveyors can endanger workers and expose employers to liability. For example, an Ontario worker was sorting potatoes on a conveyor belt when his thumb got caught in a pinch point between the belt and the machine’s frame, causing a serious hand injury. His employer pleaded guilty to a guarding violation and was fined $65,000 [*Earthfresh Foods Corp*, Govt. News Release, March 4, 2010]. So ensure that your OHS program address these key elements of compliance with the conveyor requirements to protect your workers from similar incidents and your company from similar fines.