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Regulation Review on Cranes – Your Input Needed!

WorkSafeBC is reviewing two important aspects of the regulation on cranes.

One regulation would require the retrofitting of an additional braking system for some cranes:

"A mobile crane must have two brake systems on each hoist drum operated with friction controls."

The cost of retrofitting is estimated by WorkSafeBC at between $2,000 to $4,000 per drum.

Your input is needed on this regulation. Please advise as to whether you are for it or against it and for what reasons.

Does the proposed regulation achieve a required, higher level of safety?

Is the cost estimate accurate?

A sentence or two may be all that is needed – or you may respond in more detail.

This is a complex technical question that experts can consider.

Please provide your input by December 11, 2007

The full Draft regulation is attached, both below and as a separate file.

WorkSafeBC Material

OVERVIEW

TITLE

Part 14, Cranes and Hoists
NEW section, Supervision (direction) of "critical lifts"
NEW section, Second brake on hoist drums

1. NATURE OF THE PROBLEM TO BE SOLVED

A worker was killed in June 2005 when the brake of a hoist drum on a mobile crane did not properly engage when the crane operator applied the brake before leaving the operating controls. The BC Coroners Service Judgement of Inquiry relating to this incident contained two recommendations directed to WorkSafeBC. The first recommendation relates to supervision during critical lifts, and the second recommendation relates to having second brake systems on hoist drums.

2. PURPOSE OF THE PROPOSED AMENDMENTS

A review of the Judgement of Inquiry Recommendations was done to assess the practicability of developing any necessary changes to the Occupational Health and Safety Regulation, the potential impact of such changes on improving worker safety, and to ensure WorkSafeBC is duly diligent in considering recommendations forwarded by the Chief Coroner. The review resulted in two proposals for changes to Part 14 of the Regulation.

3. SOURCE OF REQUEST

BC Coroners Service
Judgement of Inquiry into the death of Daniel Thomas McCrickard

PART 14: CRANES AND HOISTS

EQUIPMENT OPERATION
Operator's
duties 14.37.1 The operator of a crane, hoist or boom truck must have full control of the equipment controls whenever the hoisting equipment is in use,
and engaged in no other duties while operating the equipment.

Explanatory Note:

In June 2005 a worker was fatally injured when struck by the overhaul ball of a mobile crane. The overhaul ball lowered unexpectedly and struck the worker when the brake on the hoist drum for the load line did not properly engage when set by the operator before the operator left the controls to attend to other duties. The BC Coroners Service *Judgement of Inquiry* into this death made several recommendations directed to WorkSafeBC and the *Occupational Health and Safety Regulation* ("*OHSR"*). This proposed change addresses one of those recommendations, related to operator's duties and supervision.

The relevant *Judgement of Inquiry* Recommendation reads as follows:

"8) That Part 14: Cranes and Hoists, of the OHSR be amended by requiring that all critical lifts (defined in such a way so as to include all situations in which persons on the ground may be at risk of being struck by a suspended load, or any part of the mobile crane) be made under the direction of a qualified supervisor who is not operating the crane, or otherwise involved in the operation of another piece of lifting equipment."

WorkSafeBC has considered this recommendation and had some preliminary discussions with stakeholders regarding possible changes to the *OHSR*.

A number of regulation changes made to Part 14 of the *OHSR* in 2006 and 2007, such as those related to crane operator certification, critical lift definition, tandem lift and critical lift requirements for preplanning and crew meeting prior to the start of lifting operations, and overall site supervision, are beneficial in addressing some aspects of the *Judgement of Inquiry* Recommendation 8.

The requirement added in 2006 for crane operators to be certified (section 14.34.1 of the *OHSR*) has resulted in approximately 10,000 people being registered as operators and is expected to improve the overall competency of crane operations.

The 2007 amendments to the *OHSR*, effective February 1, 2008, provide a definition of critical lift, and also requirements for a tandem lift and critical lift. A tandem lift will require a supervisor who is not operating a crane or hoist. A critical lift will not require such a supervisor but will require a written lift plan, a pre-job crew meeting immediately before starting lifting operations, and that effective communications be established and maintained between all people involved in the lift. The 2007 amendments also provide new section 14.38(6) which will require the employer or prime contractor provide overall supervision and control on the worksite so people not involved in the lifting operation do not need to be supervised by the crane crew.

The definition proposed by the *Judgement of Inquiry* Recommendation for "critical lift" is very broad and would mean that if any person was within the reach of the crane or any possible load path, then a supervisor would be required. Implementing this recommendation would be impracticable. Broadening the *OHSR* definition of critical lift to reflect the proposal in Recommendation 8 is not recommended.

In the June 2005 incident, the crew was small (four people) and it appears crew inexperience may have been a factor in the crane operator, who was the crew foreman, having to regularly leave the operator's position to check on things a trained and experienced crew would be expected to do.

WorkSafeBC proposes adding a new clause restricting the duties that may be assigned to or undertaken by a crane operator similar to section 20.52 of the *OHSR* which sets out "Operator's duties" for the operator of a concrete pump and placing boom or mast. This section states:
20.52 Operator's duties
The operator of a concrete placing boom or mast must have full control of the pump and placing equipment controls whenever the equipment is operating and engage in no other duties while operating the concrete pump and placing boom or mast.

Generally industry has been training crane operators to "own the lift", meaning the operator should
understand all parameters of the lift about to be made and the role of each person involved in the lift,
and to introduce a new role for a supervisor of the lift would likely take away from the operator's sense
of overall obligation to ensure the lift can be safely made.

In proposed section 14.37.1, "in use" is intended to include equipment set up and take down as well as
any time the equipment is being positioned to lift a load or is supporting a load.

PART 14: CRANES AND HOISTS

MOBILE CRANES, BOOM TRUCKS AND SIGN TRUCKS
Hoist drum
brake
systems
14.63.1 (1) A mobile crane must have two brake systems on each hoist drum operated with friction controls.
(2) The operator of a mobile crane with a hoist drum operated with friction controls must engage both brake systems on each such hoist drum before leaving the operator's seat or crane controls.

Explanatory Note:

In June 2005 a worker was fatally injured when struck by the overhaul ball of a mobile crane. The overhaul ball lowered unexpectedly and struck the worker when the brake on the hoist drum for the load line did not properly engage when set by the operator before the operator left the controls to attend to other duties. The BC Coroners Service *Judgement of Inquiry* into this death made several recommendations directed to WorkSafeBC and the *Occupational Health and Safety Regulation*

("*OHSR*"). This proposed change addresses the recommendations related to the brake systems on operating hoist drums.

The *Judgement of Inquiry* recommendations read as follows:

"6) That the OHSR be amended to adopt the future revision of CSA Standard Z150 which will require that a positive secondary drum brake system be installed and used on all operating load hoists;

7) Alternatively, that WorkSafeBC act independently of CSA and implement in the OHSR a specific requirement that a positive secondary drum brake system be installed and used on all operating load hoists being used in all crane operations in British Columbia;

9) That Part 14: Cranes and Hoists, of the OHSR be amended by requiring that crane operators not leave their seat and/or crane controls without first engaging a secondary brake system."

WorkSafeBC is represented on the Technical Committee for the *CSA Standard Z150 Safety Code for Mobile Cranes*. The Committee has discussed the above *Judgement of Inquiry* recommendations and is generally supportive of making the appropriate change to the Standard. However, the Standard will not be "retroactive", so the provision, if it goes through, would apply only to equipment manufactured after the change to the Standard is published. There is no guarantee the change to the Standard will be made and any change to the Standard is estimated to be at least a year away from being published. WorkSafeBC proposes to act independently of CSA to propose a change to the *OHSR* to address the *Judgement of Inquiry* recommendations.

The concept of requiring a second brake on hoist drums is only relevant to mobile cranes with hoist drums operated using friction controls. These types of controls work by the operator applying power to the hoist drum through a clutch (friction) mechanism when the load line is to be spooled on or off the drum, and the operator applies a brake to secure the hoist drum from moving when the clutch for the drum is disengaged and the load line is to remain stationary. Note this type of control system requires the operator to engage the clutch to apply power to move the load line and to manually apply the brake to secure the drum and load line against movement when the clutch is disengaged. This manual application of a brake is not necessary for a hydraulically-controlled mobile crane as the crane motion automatically stops when the hoist control lever is released and returns to the neutral position, and the second brake capability is effectively provided by the design of the hydraulic system.

Generally the main hoist on a crane with friction controls has a second positive brake in the form of a dog that can be set by the operator to engage the drum and secure it against rotation. The auxiliary hoist on such a crane generally does not have a second brake. Generally a second brake can be

retrofitted (at an estimated cost of $2000-4000) but it will likely be a "maxi brake" (spring applied/air released). This type of brake would not be characterized as a positive brake. It is generally not practicable to retrofit with a dog-type brake, which would be a positive brake. The maxi type brake will require regular maintenance to keep it adjusted to function properly, but it does provide a practicable way of providing a second brake capability. Either brake type relies on the operator engaging the brake for it to function.

The proposal is to require a mobile crane with friction controls have two brake systems on hoist drums operated by friction controls and that the operator be required to engage both brakes before leaving the operator's seat or crane controls. The proposed requirement does not mandate the second brake be a positive brake, as retrofitting such a brake is not considered practicable.