

# EVOLUTION OF MOBILE CRANE INSPECTION REQUIREMENTS IN ONTARIO OCCUPATIONAL HEALTH AND SAFETY REGULATIONS

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### INTRODUCTION

Mobile cranes are a critical and substantial piece of equipment on construction sites, and they can be associated with significant risks if not operated and maintained properly. In worst-case scenarios, those risks include catastrophic accidents resulting in injuries, death, and damage to assets. To mitigate these inherent risks, the OCCUPATIONAL HEALTH AND SAFETY REGULATIONS of Ontario, along with Canadian code and standards, have evolved over the years to provide a set of regulations and guidelines for the safe operation, inspection, and maintenance of mobile cranes.

### History of Mobile Crane Safety Code and Regulations in Ontario

In Canada, the first edition of a standard for the safety of mobile cranes was published by the Canadian Standards Association (CSA) as the *Z150 Safety Code for Mobile Cranes* in December 1974. The need for such a standard was conveyed to CSA by the Construction Safety Association of Ontario following the first Canadian Construction Crane Safety Conference held in Toronto in November 1971. At that time, a safety code for tower cranes was already being developed by a CSA Committee and the conference proceedings indicated that there was a need for a similar code covering mobile cranes. A CSA Committee was then organized to develop standards for mobile cranes<sup>1</sup>.

When Ontario Occupational Health and Safety Regulations O.Reg.213/91 was issued on June 1, 1991<sup>2</sup>, it used the same terminology presented in CSA Z150 -1974 for mobile crane inspection and maintenance under section 152:

#### O. Reg. 213/91, s.152:

*152. (1) The owner of a crane or similar hoisting device shall keep a permanent record of all inspections of, tests of, repairs to, modifications to and maintenance of the crane or similar hoisting device. O. Reg. 213/91, s. 152 (1).*

*(2) The owner of a crane or similar hoisting device shall prepare a log book for it for use at a project that shall include the record referred to in subsection (1) covering the period that is the greater of,*

*(a) the immediately preceding twelve months; and*

*(b) the period the crane or similar hoisting device is on the project. O. Reg. 213/91, s. 152 (2).*

*(3) The log book shall be kept with the crane or similar hoisting device. O. Reg. 213/91, s. 152 (3).*

*(4) The owner of a crane or similar hoisting device shall retain and make available to the constructor on request copies of all log books and records for the crane or similar hoisting device. O. Reg. 213/91, s. 152 (4).*

## Evolution of Ontario Occupational Health and Safety Regulations

In 1994, an amendment was made to the O.Reg. 213/91 regulations<sup>3</sup> to involve a professional engineer and non-destructive testing in the structural integrity inspection of cranes, but only if the crane is lifting personnel under section 153 (2) (8):

**O. Reg. 213/91, s.153(2)(8):**

*(8) A professional engineer or a competent worker designated by the professional engineer shall inspect the crane to ensure its structural integrity using non-destructive testing methods approved by the Canadian General Standards Board before the crane is used to lift persons and then at least once every 12 months after that. O. Reg. 631/94, s. 4.*

Two more amendments were made to this section in 2016<sup>4</sup> and 2022<sup>5</sup> to clarify the frequency of such inspections:

**O. Reg. 213/91, s.153(2)(8):**

*(8) Before the crane is first used to lift persons, and at least once every 12 months after the first test, an engineer shall ensure that the crane be subjected to non-destructive testing to ensure the structural integrity of the crane. O. Reg. 242/16, s. 15; O. Reg. 375/22, s. 5.*

Finally, another amendment in 2016 specified the requirement for qualification of non-destructive testing personnel under section 1, (1.1):

**O. Reg. 213/91, s.1(1.1):**

*(1.1) Every non-destructive test required by this Regulation shall be carried out and interpreted by a person who has been certified by Natural Resources Canada to the appropriate level in accordance with CAN/CGSB Standard 48.9712-2014, Non-destructive Testing – Qualification and Certification of Personnel. O. Reg. 242/16, s. 2 (5).*

## Development of Crane Inspection Requirements in CSA Z150 Standard

From 1974 to 2016, the CSA standard *Z150 Safety Code for Mobile Cranes* was also evolving. When it was first revised in 1998, it better clarified what type of inspection must be done as an annual inspection. It also clarified the qualifications required for non-destructive personnel and specified the need for the involvement of a professional engineer. Moreover to O.Reg.213/91 regulations, CSA Z150 -1998<sup>6</sup> recommended such inspection for all mobile cranes, not only those used for lifting a worker:

**CSA Z150-1998:**

**4.3.5 Annual Inspection**

**4.3.5.1**

*Complete inspection of the crane shall be performed by a competent person and supervised by a professional engineer competent in the inspection of cranes. (continued on next page)*

#### 4.3.5.1 (continued)

*Visual weld inspection shall be performed and documented to CSA Standard W59 by a person qualified to the requirements of CSA Standard W178.2 or by other persons qualified to the satisfaction of the authority having jurisdiction.*

*Critical, suspect areas and other inconsistencies identified by the manufacturer, the supervising professional engineer, the competent person, or the qualified visual inspector shall be further examined by an appropriate non-destructive test method by a person(s) qualified to meet the requirements of CGSB Standard CAN/CGSB 48.9712.*

However, the scope of the inspection was still not fully clear. A crane has both structural and mechanical components that require different methods of inspection. Non-destructive testing is only applicable to structural components and not mechanical parts.

The need for such clarification led to the revision of CSA Z150 in 2016<sup>7</sup>. In this edition, it was well distinguished between the **structural** inspection and **operational and mechanical** inspection of mobile cranes:

#### CSA Z150-2016:

#### 5.3.5 Annual inspection

##### 5.3.5.1

##### 5.3.5.1.1

*Complete structural inspection of the crane shall be performed by a competent person designated by an engineer competent in the inspection of cranes. Visual weld inspection shall be performed and documented in accordance with CA W59, by a person qualified to the requirements of CSA W178.2 or a person deemed competent by the engineer.*

*Note: The authority having jurisdiction can have alternative means of qualification.*

*Operation of the crane as required for the inspection shall be carried out by a competent person. Critical areas, suspect areas, and other areas of concern identified by the manufacturer, the supervising engineer, the competent person, or the qualified visual inspector shall be further examined by an appropriate NDT method by a person(s) qualified to the requirements of CAN/CGSB 48.9712/ISO 9712.*

##### 5.3.5.2

*Complete mechanical and operational inspection of the crane shall be performed by a competent person. Operation of the crane as required for the inspection shall be carried out by a competent person. The need for disassembly of any critical component shall be determined by the manufacturer or a competent person. The manufacturer or a competent person shall approve the crane for continued use when operated in accordance with the manufacturer's instructions.*

*Inspection shall be of the mechanical and operational components as defined in Clauses 5.3.3.1 and 5.3.4.1.*

## Integration of Ontario Crane Inspection Regulations and CSA Z150-2016

Over the years, many construction sites and crane owners in Ontario followed the requirements outlined in CSA Z150 – 1998 for annual structural inspection of mobile cranes to do their due diligence in the safe operation of mobile cranes.

The question remained as to why Ontario occupational health and safety regulations were behind the evolution of the CSA Z150 standard — especially when other provinces such as British Columbia and Alberta had already implemented the crane inspection regulations in OHSR Section 14 - 2008 <sup>8</sup> and AR87 – 2009 <sup>9</sup>, respectively.

This question was answered on August 8, 2023. A significant amendment to the Ontario legislation O.Reg. 213/91 was made to be effective from January 1st, 2024 <sup>10</sup>:

*Note: On January 1, 2024, section 152 of the Regulation is revoked and the following substituted: (See: O. Reg. 241/23, s. 8)*

*152. (1) The owner of a crane or similar hoisting device shall keep an owner's crane log consisting of a record of all inspections of, tests of, repairs to, modifications to and maintenance of the crane or similar hoisting device. O. Reg. 241/23, s. 8*

*(2) If the owner's crane log does not include all the information required under subsection (1), the owner shall ensure that, before a crane is put into service at a project, an inspection of the crane or similar hoisting device is completed pursuant to the inspection requirements for tower cranes in clause 6.4.7 of CSA Standard Z248-17 and the inspection requirements for mobile cranes in clause 5.3.5 of CSA Standard Z150-16, as applicable, and the results of the inspection shall be added to the owner's crane log. O. Reg. 241/23, s. 8.*

The amendment made a clear reference to the 2016 edition of CSA Z150 for the inspection and testing of the mobile cranes. It is now clear that the owner of the crane must keep a logbook showing all the records including the inspection and test conducted as per CSA Z150-16 standard.

By referring to the 2016 edition of CSA Z150, structural inspection becomes mandatory for all mobile cranes, not only those used for lifting a worker. Also, crane owners are obliged to ensure that annual structural, operational, and mechanical inspections are conducted under the supervision of a professional engineer utilizing certified non-destructive testing personnel.

## CONCLUSION

Starting January 1, 2024, Ontario Occupational Health and Safety Regulations require all mobile cranes to be thoroughly inspected for structural integrity, safe operation, and mechanical compliance. The inspection utilizing non-destructive testing performed by certified personnel to CGSB 48.9712 must be conducted under the supervision of a professional engineer.

#### References:

- 1- Safety Code for Mobile Cranes – CSA Z150, 1974.
- 2- Ontario Occupational Health and Safety – Construction Projects, O.Reg. 213/91, 1991.
- 3- Ontario Regulation 631/94, Amending O.Reg.375/22, 1994.
- 4- Ontario Regulation 242/16, Amending O.Reg.213/91, 2016.
- 5- Ontario Regulation 242/16, Amending O.Reg.375/22, 2022.
- 6- Safety Code for Mobile Cranes – CSA Z150, 1998.
- 7- Safety Code for Mobile Cranes – CSA Z150, 2016.
- 8- British Columbia Occupational Health and Safety Regulation, B.C. Reg.296/97 Part 14.71, 2008.
- 9- Alberta Occupational Health and Safety Code, A.R. 87/2009, 2009.
- 10- Ontario Regulation 241/23, Amending O.Reg.213/91, 2023.

Indeed, the adaptation of the mobile crane industry to the new regulations will be a gradual process. It may involve adjustments to equipment, maintenance procedures, and workforce training. The implementation of such regulations is essential for several reasons, primarily centered around enhancing safety in crane operations, accident prevention, liability reduction, asset protection and, most importantly, saving lives.



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