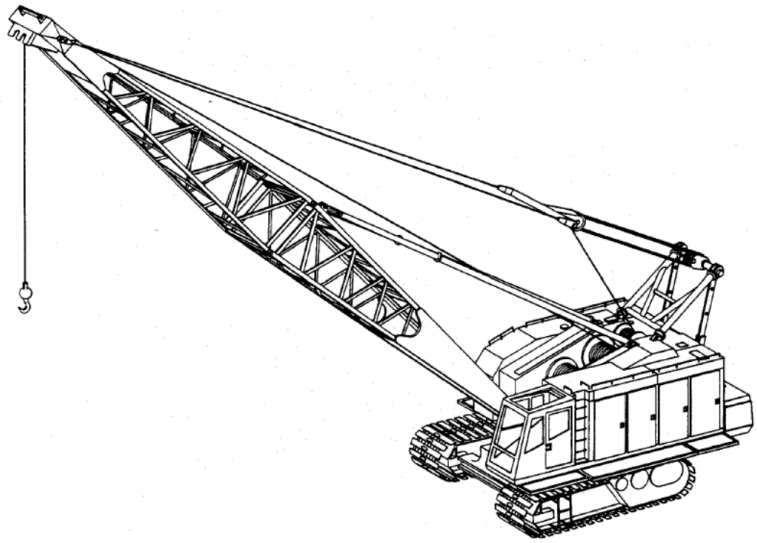
Mobile Crane Operator Standards
Lattice Boom Friction Crane

December 2009



BC Crane Safety

Crane Certification and Licensing Authority

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FOREWORD

This Program Outline is for use in guiding competency-based training of crane operators who operate Mobile Lattice Boom Cranes with Friction Drive.

The program outline contains Knowledge Units and Workplace Unit Standards of Competence (Workplace Units).

Knowledge units are achieved outside the performance of the learner's regular work as for example in a classroom or through self study of learning resources.

Workplace Units build upon the Knowledge Units and allow the learner to gather naturally occurring evidence of workplace performance while they work. Evidence is assessed against the performance standard defined by industry which is twinned with each task outlined in the Workplace Unit.

Typically credit for Knowledge Units will be achieved through learning sponsored by SkilledTradesBC (formerlythe Industry Training Authority). The Knowledge Units in this document define the desired outcome for learners to achieve in the theoretical portions of training. Industry wishes learners to have options in achieving credit for Knowledge Units and it is that methods will be devised to enable learners to achieve these outcomes using a variety of non-traditional learning methodologies such as distance education and self-study.

Safe working practices, though not always specified in each of the competencies, are a part of the safe working and learning conditions underlying all these standards and will be required in the presentation of evidence to meet these standards.

This Program Outline includes a list of recommended reference textbooks that are available to support achievement of the Knowledge Units. The final section of the Outline provides some direction by industry on training options for the program as a whole.

SAFETY ADVISORY

Be advised that references to the parts of the WorkSafeBC regulation contained within these materials do not/may not reflect the most recent Occupational Health and Safety Regulation (the current Standards and Regulation in BC can be obtained on the following website: http://www.worksafebc.com. Please note that it is always the responsibility of any person using these materials to inform him/herself about the Occupational Health and Safety

ACKNOWLEDGEMENTS

Development of the Standards

These Unit Standards were developed through extensive consultation with a broad cross section of stakeholders in BC's crane industry – crane owners, operators and other occupations which make occasional yet regular use of cranes.

The BC Association for Crane Safety (BCACS) is a nonprofit society which was formed in 2005 to lead and coordinate activities and initiatives which promote safer crane operation in BC. BCACS was started and is governed by BC's Crane Industry through a volunteer board of crane industry stakeholders. A main area of concern has been setting the standard for competent operation in BC and promotion of the industry standard to drive excellence in crane training.

The BCACS led the development of these standards through funding support of WorkSafe BC and the Industry Training Authority of BC.

In 2005 a representative group of crane owners from the Mobile Crane, Boom Truck and Tower Crane industries in BC began work to identify the Core Standards of Competence required of all Crane Operators in BC. To begin this work the Skills Profiles for Operating Engineers, produced by the Construction Sector Council, were used.

In mid 2006 the industry had identified a Common Core of Competence Standards across all crane types. The core competencies were drawn from three sets of revised Competency Profiles endorsed by the industry in 2006. These are the profiles:

1) Mobile Crane
   a) Mobile 80 tonnes and under
   b) Mobile (unlimited tonnage)
   c) Mobile Lattice Friction
   d) Mobile Lattice Hydraulic

2) Boom Cranes
   a) Boom Folding under 22 tonnes
   b) Boom Folding (unlimited tonnage)
   c) Boom Stiff under 40 tonnes
   d) Boom Stiff (unlimited tonnage)

3) Tower Cranes
   a) Tower Crane

These Competency Profiles and the Core components were submitted to the Industry Training Authority for approval as revised program standards in July of 2006. They were approved by

the ITA board shortly thereafter.

In October 2006 the ITA Board approved funding to develop industry's requested modifications to the Mobile Crane Operator Apprenticeship with a portion of the development funds assigned to develop the Crane Common Core Standards. The BCACS was awarded development funds to build the Mobile Crane Program Standards and Assessment Tools (which includes the Common Core) as an integrated on job / off job Competency Based Qualification. This Program Outline contains the Standards for Mobile Lattice Friction Crane Operators.

BCACS contracted this work to Fulford Harbour Group and Durham College in 2007. Through the first quarter of 2007 a group of Subject Matter Experts (SMEs) met to validate the Competency Standards developed from the Industry Endorsed Competency Profile. This group was made up of the following SMEs:

Barry Conroy	Richard Hobman
Gord Lindberg	Terry Lindal
Grant Washington	Brad Paddock
Steve Neil	Rob Falk
Don Cousins	Paul Welder

The development team wishes to thank the SMEs for their dedication, Fraser Cocks Executive Director and Rob Magee Chairman of the BCACS for their support in pioneering development of an innovative approach to competency based crane training, Russel Robertson of the ITA for insight and guidance through his unstinting sharing of international competency based training best practice and lastly Don Nelson of Work Safe BC for the unwavering commitment to proof of competence as the foundation of BC's crane regulations.

This work would not have been possible without the contribution of thousands of hours of industry stakeholder time through the BCACS task groups. This group expressed great patience in opening new waters for BC Crane Training and their efforts are appreciated.

Validation: Common Core and Mobile Crane Standards

The standards were validated by the following Multi-Crane Stakeholder and SME Group:

Name
Fraser Cocks
Barry Conroy
Gord Lindberg
Grant Washington
Steve Neil
Don Cousins
Richard Hobman
Terry Lindal
Brad Paddock
Rob Falk
Paul Welder

Mechanism for Adjustment

The BC Association for Crane Safety is industry's lead body in coordinating development of and updates to these standards.

For revision suggestions please e-mail info@bccranesafety.ca.

BCACS will endeavour to respond as quickly as possible to suggestions or concerns over the standards. Some suggestions or requested changes may require an industry consultation to determine their validity and relevance across all sectors of the industry.

OCCUPATION ANALYSIS CHART

Core & Mobile Crane Operator Lattice Boom Friction Crane Competency Profile Chart

1. Safety (CS)	**1.1 K** Demonstrate knowledge of safe working practices for crane operators	**1.2 K** Demonstrate knowledge of power line hazards and high voltage equipment	**1.3 W** Comply with WorkSafeBC and OH & S regulations			
	1	1	1			
2. Communications (CCOM)	**2.1 K** Demonstrate knowledge of personnel involved in crane operations	**2.2 K** Demonstrate knowledge of hand signals	**2.3 K** Demonstrate knowledge of radio communications	**2.4 K** Demonstrate knowledge of workplace communications	**2.5 W** Use hand signals in the workplace	**2.6 W** Use radio communications in the workplace
	1	1	1	1	1	1
	2.7 W Communicate information clearly and check for understanding in the workplace					
	1					
3. Cranes (CC)	**3.1 K** Demonstrate knowledge of types of cranes and classifications	**3.2 K** Demonstrate knowledge of terminology related to craning and craning concepts	**3.3 K** Demonstrate knowledge of hoisting terminology, functions and systems	**3.4 K** Demonstrate knowledge of regulatory requirements pertaining to cranes	**3.5 K** Demonstrate knowledge of crane components and attachments	**3.6 K** Demonstrate knowledge of engines and ancillary systems
	1	1	1	1	2	2
	3.7 K Demonstrate knowledge of power transfer for cranes	**3.11 K** Demonstrate knowledge of components and attachments for boom trucks with folding booms (unlimited tonnage)	**3.12 K** Demonstrate knowledge of engines and ancillary systems on boom trucks with folding booms (unlimited tonnage)	**3.13 K** Demonstrate knowledge of power transfer for boom trucks with folding booms (unlimited tonnage)	**3.17 K** Demonstrate knowledge of components and attachments for boom trucks with stiff booms (unlimited tonnage)	**3.18 K** Demonstrate knowledge of engines and ancillary systems on boom trucks with stiff booms (unlimited tonnage)
	2	2	2	2	2	2
	3.19 K Demonstrate knowledge of power transfer for boom trucks with stiff booms (unlimited tonnage)					
	2					

4. Rigging (CR)	**4.1 K** Demonstrate knowledge of lifting theory and forces					**4.2 K** Demonstrate knowledge of rigging hardware, materials, tools and manuals					**4.3 K** Demonstrate knowledge of types and function of wire rope and chains					**4.4 K** Demonstrate knowledge of installation, inspection and storage of wire rope					**4.5 K** Demonstrate knowledge of rigging techniques					**4.6 W** Use rigging hardware and tools in the workplace				
	1					1					1					1					1					1				
5. Load Charts (CLC)	**5.1 K** Demonstrate knowledge of determining weight loads using fundamental math functions and calculations					**5.2 K** Demonstrate knowledge of loading and lifting					**5.3 W** Interpret load charts and load study drawings to configure crane for workplace operation																			
	1					1					1																			
6. Transportation and Delivery (ATD)	**6.1 K** Demonstrate knowledge of BC Ministry of Transportation – Commercial Transport rules and regulations as they pertain to transportation of cranes					**6.2 K** Demonstrate knowledge to prepare and to transport a mobile crane					**6.3 K** Demonstrate knowledge to assemble and disassemble a crane at a worksite					**6.4 W** Prepare and transport a mobile crane to a worksite following all Highway and traffic rules and regulations					**6.5 W** Assemble and disassemble a crane at a worksite					**6.8 K** Demonstrate knowledge of BC Ministry of Transportation – Commercial Transport rules and regulations as they pertain to driving boom trucks with folding booms (unlimited tonnage)				
		2					2					2					2					2					2			
	6.9 K Demonstrate knowledge to prepare a boom truck with a folding boom (unlimited tonnage) for highway/road travel					**6.12 K** Demonstrate knowledge of BC Ministry of Transportation – Commercial Transport rules and regulations as they pertain to the driving of boom trucks with stiff booms (unlimited tonnage)					**6.13 K** Demonstrate knowledge to prepare a boom truck with a stiff boom (unlimited tonnage) for highway/road travel																			
		2					2					2																		
7. Site Planning and Crane Positioning (ASPCP)	**7.1 K** Demonstrate knowledge of accurate site assessment tools					**7.2 K** Demonstrate knowledge to locate and safely position crane					**7.3 W** Conduct an accurate site assessment and safely position a crane in the workplace					**7.6 K** Demonstrate knowledge to locate and safely position a boom truck with a folding boom (unlimited tonnage) using site assessment tools					**7.7 W** Conduct an accurate site assessment and safely position a boom truck with a folding boom (unlimited tonnage) in the workplace					**7.10 K** Demonstrate knowledge to safely position a boom truck with a stiff boom (unlimited tonnage) in the workplace				
		2					2					2					2					2					2			

	7.11 W Conduct an accurate site assessment and safely position a boom truck with a stiff boom (unlimited tonnage) in the workplace 2					
8. **Crane Operations (CCO)**	**8.1 K** Demonstrate knowledge of pre-operational requirements in crane operations 1	**8.2 K** Demonstrate knowledge of crane operations 2	**8.3 K** Demonstrate knowledge to leave a crane unattended 2	**8.4 W** Demonstrate crane set-up per manufacturer's instructions (except Task 4 in Mobile) 1	**8.4 W** Demonstrate crane set-up per manufacturer's instructions – Task 4 only (others core) 2	**8.5 W** Use a mobile crane to safely pick and carry loads in a workplace 2
	8.6 W Leave a crane unattended. 2	**8.9 K** Demonstrate knowledge of operating a boom truck with a folding boom (unlimited tonnage) 2	**8.10 W** Operate a boom truck with a folding boom (unlimited tonnage) to safely lift and place loads in a workplace 2	**8.13 K** Demonstrate knowledge of operating a boom truck with a stiff boom (unlimited tonnage) 2	**8.14 W** Operate a boom truck with a stiff boom (unlimited tonnage) to safely pick up and carry loads in a workplace 2	
9. **Maintenance and Service (CMS)**	**9.1 W** Maintain an equipment logbook to retain a permanent written record of maintenance and repairs 1	**9.2 K** Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems 2	**9.3 K** Demonstrate knowledge of servicing and maintenance procedures on mobile cranes 2	**9.4 W** Complete maintenance checklists (engine on/ engine off) and maintain engines to manufacturer's specifications 2	**9.5 W** Perform routine inspections and maintenance of hydraulic systems 2	**9.6 W** Inspect monitoring devices and control mechanisms 2
	9.7 W Perform service on engine cooling systems on mobile cranes 2	**9.13 K** Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with folding booms (unlimited tonnage) 2	**9.14 K** Demonstrate knowledge of servicing and maintenance procedures on boom trucks with folding booms (unlimited tonnage) 2	**9.15 W** Complete maintenance checklists (engine on/ engine off) and maintain engines on a boom truck with a folding boom (unlimited tonnage) to manufacturer's specifications 2	**9.16 W** Perform routine inspections and maintenance of hydraulic systems on a boom truck with a folding boom (unlimited tonnage) 2	**9.17 W** Inspect monitoring devices and control mechanisms on a boom truck with a folding boom (unlimited tonnage) 2

	9.23 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with stiff booms (unlimited tonnage)	**9.24 K** Demonstrate knowledge of servicing and maintenance procedures on boom trucks with stiff booms (unlimited tonnage)	**9.25 W** Complete maintenance checklists (engine on/ engine off) and maintain engines on a boom truck with a stiff boom (unlimited tonnage) to manufacturer's specifications	**9.26 W** Perform routine inspections and maintenance of hydraulic systems on a boom truck with a stiff boom (unlimited tonnage)	**9.27 W** Inspect monitoring devices and control mechanisms on a boom truck with a stiff boom (unlimited tonnage)
	2	2	2	2	2
10. Hydraulic Boom Crane (no tonnage restrictions) (AHBC)	**10.1 K** Demonstrate knowledge of hydraulic boom crane structure and assembly	**10.2 K** Demonstrate knowledge of hydraulic boom crane load charts and load calculations	**10.3 K** Demonstrate knowledge of lift plans and rigging for hydraulic broom cranes	**10.4 W** Operate a hydraulic boom crane safely according to manufacturer's specifications and regulations	
	2	2	2	2	
11. Lattice Boom Crane (ALBC)	**11.1 K** Demonstrate knowledge of lattice boom crane structure and assembly	**11.2 K** Demonstrate knowledge of lattice boom crane load charts and load calculations	**11.3 K** Demonstrate knowledge of lift plans and rigging for lattice boom cranes	**11.4 W** Operate a lattice boom crane safely according to manufacturer's specifications and regulations	
	2	2	2	2	
12. Lattice Friction Crane (ALFC)	**12.1 K** Demonstrate knowledge of lattice friction crane structure and assembly	**12.2 K** Demonstrate knowledge of lattice friction crane load charts and load calculations	**12.3 K** Demonstrate knowledge of lifting plans and rigging for lattice friction cranes	**12.4 W** Operate a lattice friction crane safely according to manufacturer's specifications and regulations	
	2	2	2	2	

CORE
&
MOBILE CRANE OPERATOR
LATTICE BOOM FRICTION CRANE

OPERATOR STANDARDS

SUGGESTED INSTRUCTIONAL TIME ALLOTMENTS CORE

Core Level		Theory	Practical
Unit	**Section 1 – Safety Knowledge % of Time**	**5%**	
CS 1.1 K	Demonstrate knowledge of safe working practices for crane operators	✓	
CS 1.2 K	Demonstrate knowledge of power line hazards and high voltage equipment	✓	
Unit	**Section 1 – Safety Practical (Workplace) standards**	**Must meet**	
CS 1.3 W	Comply with WorkSafeBC and OH & S regulations		✓
	Total Percentage for Section 1	**5%**	
Unit	**Section 2 - Communications Knowledge% of Time**	**5%**	
CCOM 2.1 K	Demonstrate knowledge of personnel involved in crane operations	✓	
CCOM 2.2 K	Demonstrate knowledge of hand signals	✓	
CCOM 2.3 K	Demonstrate knowledge of radio communications	✓	
CCOM 2.4 K	Demonstrate knowledge of workplace communications	✓	
Unit	**Section 2 - Communications Practical standards**	**Must meet**	
CCOM 2.5 W	Use hand signals in the workplace		✓
CCOM 2.6 W	Use radio communications in the workplace		✓
CCOM 2.7 W	Communicate information clearly and check for understanding in the workplace		✓
	Total Percentage for Section 2	**5%**	

Core Level		Theory	Practical
Unit	**Section 3 – Cranes Knowledge % of Time**	**10%**	
CC 3.1 K	Demonstrate knowledge of types of cranes and classifications	✓	
CC 3.2 K	Demonstrate knowledge of terminology related to craning and craning concepts	✓	
CC 3.3K	Demonstrate knowledge of hoisting terminology, functions and systems	✓	
CC 3.4 K	Demonstrate knowledge of regulatory requirements pertaining to cranes	✓	
	Total Percentage for Section 3	**10%**	
Unit	**Section 4 – Rigging Knowledge % of Time**	**20%**	
CR 4.1 K	Demonstrate knowledge of lifting theory and forces	✓	
CR 4.2 K	Demonstrate knowledge of rigging hardware, materials, tools and manuals	✓	
CR 4.3 K	Demonstrate knowledge of types and function of wire rope and chains	✓	
CR 4.4 K	Demonstrate knowledge of installation, inspection and storage of wire rope	✓	
CR 4.5 K	Demonstrate knowledge of rigging techniques	✓	
Unit	**Section 4 - Rigging Practical standards**	**Must meet**	
CR 4.6 W	Use rigging hardware and tools in the workplace		✓
	Total Percentage for Section 4	**20%**	
Unit	**Section 5 – Load Charts Knowledge % of Time**	**30**	
CLC 5.1 K	Demonstrate knowledge of determining weight loads using fundamental math functions and calculations	✓	
CLC 5.2 K	Demonstrate knowledge of loading and lifting	✓	
Unit	**Section 5 – Load Charts Practical standards**	**Must meet**	
CLC 5.3 W	Interpret load charts and load study drawings to configure crane for workplace operation		✓
	Total Percentage for Section 5	**30%**	

Core Level		Theory	Practical
Unit	**Section 8 – Crane Operations - Knowledge**	**30%**	
CCO 8.1 K	Demonstrate knowledge of pre-operational requirements in crane operations	✓	
Unit	**Section 8 – Crane Operations – Practical standards**	**Must meet**	
CCO 8.4 W	Demonstrate crane set-up per manufacturer's instructions (except Task 4 in Mobile)		✓
	Total Percentage for Section 8	**30%**	
Unit	**Section 9 - Maintenance & Service – practical standards**	**Must meet**	
CMS 9.1 W	Maintain an equipment logbook to retain a permanent written record of maintenance and repairs		✓
	Total Percentage for Section 9		
	TOTAL ALL UNITS	**100%**	

SUGGESTED TIME ALLOTMENTS
MOBILE CRANE OPERATOR LATTICE BOOM FRICTION CRANE

Mobile Crane Operator Lattice Boom Friction Crane		Theory	Practical
Unit	**Section 3 – Cranes - Knowledge % of Time**		
AC 3.5 K	Demonstrate knowledge of crane components and attachments	✓	
AC 3.6 K	Demonstrate knowledge of engines and ancillary systems	✓	
AC 3.7 K	Demonstrate knowledge of power transfer for cranes	✓	
AC 3.11 K	Demonstrate knowledge of components and attachments for boom trucks with folding booms (unlimited tonnage)	✓	
AC 3.12 K	Demonstrate knowledge of engines and ancillary systems on boom trucks with folding booms (unlimited tonnage)	✓	
AC 3.13 K	Demonstrate knowledge of power transfer for boom trucks with folding booms (unlimited tonnage)	✓	
AC 3.17 K	Demonstrate knowledge of components and attachments for boom trucks with stiff booms (unlimited tonnage)	✓	
AC 3.18 K	Demonstrate knowledge of engines and ancillary systems on boom trucks with stiff booms (unlimited tonnage)	✓	
AC 3.19 K	Demonstrate knowledge of power transfer for boom trucks with stiff booms (unlimited tonnage)	✓	
	Total Percentage for Section 3		

Unit	**Section 6 - Transportation & Delivery – Knowledge % of Time**		
ATD 6.1 K	Demonstrate knowledge of BC Ministry of Transportation – Commercial Transport rules and regulations as they pertain to transportation of cranes	✓	
ATD 6.2 K	Demonstrate knowledge to prepare and to transport a mobile crane	✓	
ATD 6.3 K	Demonstrate knowledge to assemble and disassemble a crane at a worksite	✓	

Unit	**Section 6 - Transportation & Delivery – Practical**	**Must meet standards**	
ATD 6.4 W	Prepare and transport a mobile crane to a worksite following all Highway and traffic rules and regulations		✓
ATD 6.5 W	Assemble and disassemble a crane at a worksite		✓

Mobile Crane Operator Lattice Boom Friction Crane		Theory	Practical
ATD 6.8 K	Demonstrate knowledge of BC Ministry of Transportation – Commercial Transport rules and regulations as they pertain to driving boom trucks with folding booms (unlimited tonnage)	✓	
ATD 6.9 K	Demonstrate knowledge to prepare a boom truck with a folding boom (unlimited tonnage) for highway/road travel	✓	
ATD 6.12 K	Demonstrate knowledge of BC Ministry of Transportation – Commercial Transport rules and regulations as they pertain to delivery of boom trucks with stiff booms (unlimited tonnage)	✓	
ATD 6.13 K	Demonstrate knowledge to prepare a boom truck with a stiff boom (unlimited tonnage) for highway/road travel	✓	
	Total Percentage for Section 6		

Unit	Section 7 - Site Planning & Crane Positioning - Knowledge	% of Time	
ASPCP 7.1 K	Demonstrate knowledge of accurate site assessment tools	✓	
ASPCP 7.2 K	Demonstrate knowledge to locate and safely position crane	✓	
ASPCP 7.6 K	Demonstrate knowledge to locate and safely position a boom truck with a folding boom (unlimited tonnage) using site assessment tools	✓	
ASPCP 7.10 K	Demonstrate knowledge of accurate site assessment tools	✓	

Unit	Section 7 - Site Planning & Crane Positioning – Practical	Must meet standards	
ASPCP 7.3 W	Conduct an accurate site assessment and safely position a crane in the workplace		✓
ASPCP 7.7 W	Conduct an accurate site assessment and safely position a boom truck with a folding boom (unlimited tonnage) in the workplace		✓
ASPCP 7.11 W	Conduct an accurate site assessment and safely position a boom truck with a stiff boom (unlimited tonnage) in the workplace		✓
	Total Percentage for Section 7		

Unit	Section 8 – Crane Operations - Knowledge	% of Time	
ACO 8.2 K	Demonstrate knowledge of crane operations	✓	
ACO 8.3 K	Demonstrate knowledge to leave a crane unattended	✓	

Mobile Crane Operator Lattice Boom Friction Crane		Theory	Practical
ACO 8.11 K	Demonstrate knowledge of operating a boom truck with a folding boom (unlimited tonnage)	✓	
ACO 8.13 K	Demonstrate knowledge of operating a boom truck with a stiff boom (unlimited tonnage)	✓	

Unit	Section 8 – Crane Operations – Practical	Must meet standards
ACO 8.4 W	Demonstrate crane set-up per manufacturer's instructions	✓
ACO 8.5 W	Use a mobile crane to safely pick and carry loads in a workplace	✓
ACO 8.6 W	Leave a crane unattended	✓
ACO 8.12 W	Operate a boom truck with a folding boom (unlimited tonnage) to safely lift and place loads in a workplace	✓
ACO 8.14 W	Operate a boom truck with a stiff boom (unlimited tonnage) to safely pick and carry loads in a workplace	✓
	Total Percentage for Section 8	

Unit	Section 9 - Maintenance & Service - Knowledge % of Time	
AMS 9.2 K	Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems	✓
AMS 9.3 K	Demonstrate knowledge of servicing and maintenance procedures on mobile cranes	✓
AMS 9.13 K	Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with folding booms (unlimited tonnage)	✓
AMS 9.14 K	Demonstrate knowledge of servicing and maintenance procedures on boom trucks with folding booms (unlimited tonnage)	✓
AMS 9.23 K	Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with stiff booms (unlimited tonnage)	✓
AMS 9.24 K	Demonstrate knowledge of servicing and maintenance procedures on boom trucks with stiff booms o(unlimited tonnage)	✓

Unit	Section 9 - Maintenance & Service - Practical	Must meet standards
AMS 9.4 W	Complete maintenance checklists (engine on/ engine off) and maintain engines to manufacturer's specifications	✓
AMS 9.5 W	Perform routine inspections and maintenance of hydraulic systems	✓
AMS 9.6 W	Inspect monitoring devices and control mechanisms	✓

Mobile Crane Operator Lattice Boom Friction Crane		Theory	Practical
AMS 9.7 W	Perform service on engine cooling systems on mobile cranes		✓
AMS 9.15 W	Complete maintenance checklists (engine on/ engine off) and maintain engines on a boom truck with a folding boom (unlimited tonnage) to manufacturer's specifications		✓
AMS 9.16 W	Perform routine inspections and maintenance of hydraulic systems on a boom truck with a folding boom (unlimited tonnage)		✓
AMS 9.17 W	Inspect monitoring devices and control mechanisms on a boom truck with a folding boom (unlimited tonnage)		✓
AMS 9.25 W	Complete maintenance checklists (engine on/ engine off) and maintain engines on a boom truck with a stiff boom (unlimited tonnage) to manufacturer's specifications		✓
AMS 9.26 W	Perform routine inspections and maintenance of hydraulic systems on a boom truck with a stiff boom (unlimited tonnage)		✓
AMS 9.27 W	Inspect monitoring devices and control mechanisms on a boom truck with a stiff boom (unlimited tonnage)		✓
	Total Percentage for Section 9		

Unit	Section 10 – Hydraulic Boom - Knowledge % of Time	
AHBC 10.1 K	Demonstrate knowledge of hydraulic boom crane structure and assembly	✓
AHBC 10.2 K	Demonstrate knowledge of hydraulic boom crane load charts and load calculations	✓
AHBC 10.3 K	Demonstrate knowledge of lift plans and rigging for hydraulic broom cranes	✓

Unit	Section 10 – Hydraulic Boom- Practical (Workplace)	Must meet Standards
AHBC 10.4 W	Operate a hydraulic boom crane safely according to manufacturer's specifications and regulations	✓
	Total Percentage for Section 10	

Unit	Section 11 – Lattice Boom - Knowledge % of Time	
ALBC 11.1 K	Demonstrate knowledge of lattice boom crane structure and assembly	✓

Mobile Crane Operator Lattice Boom Friction Crane		Theory	Practical
ALBC 11.2 K	Demonstrate knowledge of lattice boom crane load charts and load calculations	✓	
ALBC 11.3 K	Demonstrate knowledge of lift plans and rigging for lattice boom cranes	✓	

Unit	Section 11 – Lattice Boom- Practical (Workplace)	Must meet standards	
ALBC 11.4 W	Operate a lattice boom crane safely according to manufacturer's specifications and regulations		✓
	Total Percentage for Section 11		

Unit	Section 12 – Lattice Boom - Knowledge % of Time		
ALFC 12.1 K	Demonstrate knowledge of lattice friction crane structure and assembly	✓	
ALFC 12.2 K	Demonstrate knowledge of lattice friction crane load charts and load calculations	✓	
ALFC 12.3 K	Demonstrate knowledge of lifting plans and rigging for lattice friction cranes	✓	

Unit	Section 12 – Lattice Friction- Practical (Workplace)	Must meet standards	
ALFC 12.4 W	Demonstrate knowledge of lifting plans and rigging for lattice friction cranes		✓
	Total Percentage for Section 12		

PROGRAM OUTLINE
FOR
SECTION 1
SAFETY

SECTION 1 – SAFETY
Unit Standard CS 1.1 K

SAFETY
Demonstrate knowledge of safe working practices for crane operators Core

Purpose
This unit of competency covers knowledge of potential hazards in the workplace.

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Describe workplace hazards in terms of the WorkSafeBC OHS regulations and how to eliminate, isolate, or minimize hazards.

Performance standards

1.1 Energy source hazards are described.

Must include
1. hydraulic
2. steam
3. electrical
4. air
5. stored energy
6. gravitational
7. pinch points
8. barriers
9. guards

1.2 Overhead hazards are described.

Must include
1. power lines
2. cranes
3. scaffolding
4. falling objects

1.3 Falling and lifting hazards and safe lifting procedures are described.

Must include
1. open holes
2. scaffolding

1.4 Mobile machinery hazards are described.

Must include
1. trains
2. trucks
3. cranes
4. forklift trucks
5. mobile conveyor

1.5 Rotating equipment hazards are described.

Must include
1. belts
2. pulleys
3. sheaves
4. conveyors
5. sprockets
6. chains

7. couplings
8. pinch points
9. barriers
10. guards

1.6 Gas hazards are described

Must include
1. explosive gases
2. poisonous gases
3. atomizers
4. oxygen deprived atmospheres
    a. methane (CH_4)
    b. lower explosive limit (LEL)
    c. hydrogen sulphide (H_2S).

Task 2
Demonstrate knowledge of worksite hazard risk assessment and risk management procedures.

Performance standards
2.1 Risk assessment procedures and risk management procedures are described.

Must include
1. responsibility to maintain a safe work environment
2. changing weather
3. frozen surfaces
4. traffic
5. location
6. operating blind
7. slips
8. trips and falls
9. injury to others
10. injury from moving machinery.

2.2 Methods of communicating risks and risk situations to others are explained.

Must include
1. signage
2. tagging
3. verbal communications
4. written communications
5. safe work cards
6. risk hazard assessment procedures

2.3 Notifying local utilities when operating near utility lines or potential hazards is explained.

Task 3
Demonstrate knowledge of accident and incident reporting procedures.

3.1 Requirements for recording an accident and incident are explained

Must include
1. report form completion
2. report form processing

Task 4
Describe personal protection equipment.

Performance standards

4.1 Breathing protection equipment is described.

Must include
1. respirators and filters
2. dust protection
3. hand protection

4.2 Eye protection equipment in terms of goggles and shields.

4.3 Personal protective equipment and clothing (PPE) is described.

Must include
1. hard hat
2. boots
3. eyewear
4. hearing protection

Task 5
Demonstrate knowledge of response to fire emergencies.

Performance standards

5.1 Fire extinguisher types, servicing and use are described.

Must include
1. extinguisher types and capacities
2. use of extinguishers

5.2 Procedures for fighting electrical fires are explained.

Must include
1. isolate power
2. fire fighting equipment

5.3 Fire emergency response and evacuation procedures in accordance with industry practice are described.

Task 6
Describe procedure for emergency rescue from a crane.

Performance standard

5.1 Emergency rescue procedures are described.

Must include
1. tower crane operator station rescues
2. crane accident
3. crane fire

Task 7
Describe the 3 point contact method when mounting and dismounting equipment

Must include
1. cranes
2. other heavy equipment

Unit Standard CS 1.2 K

SAFETY
Demonstrate knowledge of power line hazards and high voltage equipment

Purpose

This unit standard covers knowledge about crane operation around high voltage equipment.

Prerequisite

CS 1.1 K Demonstrate knowledge of safe working practices for crane operators

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CSA Standard Z150-1974 Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual,
Construction Safety Association of Ontario, 1997
CSA Standard Z150-1974 Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS)
and delivery agency policy
BC Hydro High Voltage safety manual

Task 1

Describe procedures for operating in proximity of overhead conductors.

Performance standard

1.1 Operating procedures in the vicinity of overhead conducts are described.

Must include

1. interpret signage related to high voltage
2. state safe limits of approach to overhead conductors

1.2 Procedures if contact is made with high voltage equipment are explained.

Must include

1. break crane contact with wire if possible
2. stay in cab until de-energized by utility company
3. jump clear
    a. step potential (toe to heel)
4. apply first aid
5. inspect machine for damage caused by contact
6. report contact to job supervisor immediately
7. report contact to WorkSafeBC immediately
8. report contact to utility company immediately
9. record contact in crane Work Record log book

Unit Standard CS 1.3 W

Safety
Comply with WorkSafeBC OHS regulations

Purpose
Interpret and comply with WorkSafeBC OHS regulations, standards and guidelines.

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual,
Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Comply with WorkSafeBC OHS regulations and procedures applicable to workers in the industrial workplace by demonstrating knowledge gained in training.

Performance standards
1.1 The purpose and role of WorkSafeBC is upheld while in the workplace.

1.2 The rights and responsibilities of employers and employees are protected and upheld

1.3 Reporting procedures are accurately completed

1.4 Thorough workplace inspections are performed

1.5 WorkSafeBC OHS regulations, standards and guidelines are complied with and adhered to in the workplace.

Must include

1. all regulations applicable in the apprentices workplace

PROGRAM OUTLINE FOR SECTION 2 COMMUNICATIONS

SECTION 2 – COMMUNICATIONS
Unit Standard CCOM 2.1 K

Communications
Demonstrate knowledge of personnel involved in crane operations - core

Purpose

Demonstrate knowledge of the personnel involved in crane operations and in a traditional workplace.

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual,
Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1

Describe the personnel involved in a workplace and the roles they play.

Performance standards

1.1 The roles and responsibilities are explained for personnel in the workplace

Must include

1. site supervisor
2. crane operator
3. rigger
4. signaller
5. CSO – construction safety officer

Unit Standard CCOM 2.2 K

Communications
Demonstrate knowledge of hand signals – core

Purpose

Demonstrate knowledge of hand signals used in crane operations

Prerequisite

Unit Standard 2.1 K Demonstrate knowledge of personnel involved in crane operations

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual,
Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, CSA Standard Z248 Safety Code for Tower Cranes
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1

Describe the hand signals used during crane operations.

Performance standards

1.1 Hand signals are accurately described

1.2 Hand signals are accurately identified and interpreted

1.3 Requirements of the crane hand signaller are explained

Unit Standard CCOM 2.3 K

Communications
Demonstrate knowledge of radio communications - core

Purpose

Demonstrate knowledge of the use of radio communications in the workplace.

Prerequisites

Unit Standard 2.1 K Demonstrate knowledge of personnel involved in crane operations
Unit Standard 2.2 K Demonstrate knowledge of hand signals

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual,
Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1

Describe the use of two-way electronic voice communication devices

Performance standards

1.1 The basic functions of the radio communication devices are described

1.2 Language and terminology used during radio communication is explained

Must include

1. short form words and phrases
2. use of 12 o'clock (clock face positioning reference) to aid in direction giving and interpreting

1.3 Use of two-way communication devices are demonstrated and tested in a class room environment.

Must include

1. Lost contact by radio and requirements to stop operation

Unit Standard CCOM 2.4 K

Communications
Demonstrate knowledge of workplace communications - core

Purpose
Demonstrate knowledge of the use of effective communications in the workplace.

Prerequisite
Unit Standard 2.1 K Demonstrate knowledge of personnel involved in crane operations

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual,
Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Definitions
Active listening –the skills of listening. These skills may include but are not limited to questioning, reading and responding to body language, use of silence, paraphrasing, reflecting feels, summarizing

Task 1

Demonstrate knowledge of basic workplace documents and explain the need to correctly act on the content

Performance standards

1.1 Basic written communications in the workplace are described and interpreted accurately.

Must include

1. work orders and written instructions
2. work records
3. company logs
4. basic project plan
5. written reports

1.2 Techniques to ensure clear communication is achieved are explained

Must include

1. English workplace vocabulary
2. non-verbal communications
3. use of tone and volume
4. slang
5. cultural and geographical differences in language
6. tact
7. diplomacy
8. assertiveness

1.3 Techniques for checking understanding are described.

Must include

1. active and focused listening
2. recapping the key points
3. restating the instruction or sentence
4. clarifying questions

1.4 Hazards to personnel and equipment when communication breaks down in terms of safety and liability are described.

1.5 Causes of communication breakdowns are described.

Must include

1. noise
2. language differences
3. hearing problem (that may not have been identified)
4. bias
5. attitude
6. issues with egos and arrogance
7. issues with timidness and fear of speaking up

Unit Standard CCOM 2.5 W

Communications
Use hand signals in the workplace - core

Purpose

Demonstrate ability to use hand signals correctly in crane operations

Prerequisites

Unit Standard CCOM 2.1 K Demonstrate knowledge of personnel involved in crane operations
Unit Standard CCOM 2.2 K Demonstrate knowledge of hand signals
Unit Standard CCOM 2.3 K Demonstrate knowledge of radio communications
Unit Standard CCOM 2.4 K Demonstrate knowledge of workplace communications

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual,
Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1

Use hand signals and respond to hand signals during crane operations.

Performance standards

1.1 Hand signals are accurately used

1.2 Hand signals of others are accurately identified and interpreted

1.3 Hand signals aided in the safe and correct completion of a crane operation

Unit Standard CCOM 2.6 W

Communications
Use radio communications in the workplace - core

Purpose

Demonstrate ability to use radio communications in the workplace.

Prerequisites

Unit Standard CCOM 2.1 K Demonstrate knowledge of personnel involved in crane operations
Unit Standard CCOM 2.2 K Demonstrate knowledge of hand signals
Unit Standard CCOM 2.3 K Demonstrate knowledge of radio communications
Unit Standard CCOM 2.4 K Demonstrate knowledge of workplace communications

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1

Use a two-way electronic voice communication device in the workplace

Performance standards

1.1 Basic functions of the radio communication devices are used according to equipment instructions

1.2 Language and terminology used during radio communication is clearly understood

1.3 Two-way communication devices are used to relay clear, concise, relevant information.

Unit Standard CCOM 2.7 W

Communications
Communicate information clearly and check for understanding in the workplace – core

Purpose
Demonstrate knowledge of the use of effective and clear communications in the workplace.

Prerequisite
Unit Standard CCOM 2.1 K Demonstrate knowledge of personnel involved in crane operations

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Definitions
Active listening –the skills of listening. These skills may include but are not limited to questioning, reading and responding to body language, use of silence, paraphrasing, reflecting feels, summarizing

Task 1

Read and demonstrate the correct interpretation of workplace documents

Performance standards

1.1 Use and interpret basic written communications in the workplace to accurately perform tasks as assigned.

Must include

1. work orders and written instructions
2. maintenance records
3. company logs
4. basic project plan
5. written reports.

1.2 Use techniques to ensure clear communication is achieved in the workplace

Must include

1. English workplace vocabulary
2. non-verbal communications
3. use of tone and volume
4. colloquialisms
5. cultural and geographical differences in language
6. tact
7. diplomacy
8. assertiveness.

1.3 Use techniques for checking understanding with colleagues

Must include

1. active and focused listening
2. recapping the key points
3. restating the instruction or sentence
4. clarifying questions.

1.4 Breakdown in communication does not occur and personnel and equipment are not exposed to hazards

1.5 Communicates clearly, fairly and accurately despite workplace communication barriers.

May include

1. noise
2. language differences
3. hearing problem (that may not have been identified)
4. bias
5. attitude
6. issues with egos and arrogance
7. issues with timidness and fear of speaking up.

PROGRAM OUTLINE
FOR
SECTION 3

CRANES

SECTION 3 – CRANES
Unit Standard CC 3.1 K

Cranes
Demonstrate knowledge of types of cranes and classifications- Core

Purpose

Demonstrate knowledge of types of cranes.

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1

Describe the types of cranes and their key functions.

Performance standards

1.1 The purpose and functions of cranes are described.

Must include

1. boom trucks
2. mobile cranes
3. tower cranes
4. self erect cranes

1.2 Cranes are categorized using classifications.

Must include

1. carrier types (e.g. crawler, rubber)
2. hoist mechanisms (e.g. hydraulic, conventional, electrical)
3. lifting capacity
4. boom types (e.g. lattice, hydraulic, knuckle boom, luffing boom.)
5. heavy lift cranes (e.g. super lift, ringer)
6. tower cranes
7. self-erect cranes

Unit Standard CC 3.2 K

Cranes
Demonstrate knowledge of terminology related to craning and craning concepts - core

Purpose

Demonstrate knowledge of terminology related to craning and craning concepts.

Prerequisite

Unit Standard CC 3.1 K Demonstrate knowledge of cranes and classifications
Unit Standard CC 3.2 K Demonstrate knowledge of crane components and attachments

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1

Describe terms related to craning commonly used in the work environment

Performance standards

1.1 Terms related to craning are explained and must include:

1. wire rope
2. fittings
3. drums
4. hooks
5. sheaves
6. winch
7. slew / swing
8. hoist
9. boom
10. swing brake
11. swing dog
12. mast
13. gantry
14. overload protection systems (limits)

Task 5

Demonstrate knowledge of travel braking systems in crane operations.

Performance standards

5.1 Components of the braking systems are described and their functions explained

Must include

1. air compressor
2. brake chambers
3. drums
4. brake bands
5. slack adjusters

5.2 Defects or malfunctions of braking systems are described

Must include

1. air compressors
2. brake chambers
3. drums
4. brake bands
5. slack adjusters

Unit Standard CC 3.3 K

Cranes
Demonstrate knowledge of hoisting terminology, functions and systems - core

Purpose

Demonstrate knowledge of hoisting terminology, functions and systems for crane operations

Prerequisite

Unit Standard CC 3.1 K Demonstrate knowledge of cranes and classifications
Unit Standard CC 3.2 K Demonstrate knowledge of crane components and attachments

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1

Demonstrate knowledge of hoisting functions and systems for crane operation

Performance Standards

1.1 Components of hoisting systems are described and their functions explained

Must include

1. hydraulic boom
2. lattice boom
3. drums
4. hooks
5. sheaves
6. winch
7. brakes and clutches
8. trolley
9. roller
10. swing bearing

1.2 Defects or malfunctions of hoisting systems are described

Must include

1. hydraulic boom
2. lattice boom
3. drums
4. hooks
5. sheaves
6. winch
7. brakes and clutches
8. trolley
9. roller
10. swing bearing

Unit Standard CC 3.4 K

Cranes
Demonstrate knowledge of regulatory requirements pertaining to cranes - Core

Purpose

Demonstrate knowledge of the regulations to legally and safely operate cranes.

Prerequisite

Unit Standard CC 3.1 K Demonstrate knowledge of cranes and classifications
Unit Standard CC 3.2 K Demonstrate knowledge of crane components and attachments
Unit Standard CC 3.3 K Demonstrate knowledge of engines and ancillary systems

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy
IPT Crane and rigging manual

Task 1

Demonstrate knowledge of how the regulations apply to the operation of cranes in a workplace.

Performance standards

1.1 The impact of current regulations on workplace practices and crane operations is described

Must include

1. WorkSafeBC Occupational Health and Safety (OHS) regulations
2. The Hoisting and Rigging Safety Manual
3. Construction Safety Association of Ontario, 1997
4. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes
5. CSA Standard Z248 Safety Code for Tower Cranes
6. ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
7. Workplace Hazardous Material Information System (WHMIS)
8. Delivery agency policy

CORE PROGRAM OUTLINE

PROGRAM OUTLINE FOR SECTION 4 RIGGING

SECTION 4 – RIGGING
Unit Standard CR 4.1 K

Rigging
Demonstrate knowledge of lifting theory and forces – Core

Purpose
Demonstrate knowledge of the fundamentals of leverage

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1
Demonstrate knowledge of the principles of leverage

Performance standards

1.1 The principles of leverage are described

Must include
1. Sling angles
2. Class 1 lever
3. Class 2 lever
4. Class 3 lever
5. Centre of gravity
6. Sine of angle

Unit Standard CR 4.2 K

Rigging
Demonstrate knowledge of rigging hardware, materials, tools and manuals - Core

Purpose

Demonstrate knowledge of rigging hardware, materials, tools and manuals to safely rig a crane.

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
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and delivery agency policy

Task 1

Demonstrate knowledge of rigging hardware used in crane operations

Performance standards

1.1 Rigging hardware and its uses are described

Must include

1. hooks
2. shackles
3. slings
4. spreader bars
5. equalizer beams
6. chains
7. bridles
8. chokers

1.2 Specific information on rigging hardware from manufacturer's and rigging manuals is described and interpreted accurately according to industry standards

Task 2

Demonstrate knowledge of inspection, service and repairs to rigging hardware.

2.1 The procedure for inspecting rigging hardware is described as per manufacturer's manuals

2.2 Requirements for examining rigging hardware are described

Must include

1. excessive wear
2. damage
3. fraying
4. cracks
5. safety clips
6. broken wire

Task 3

3.1 Criteria for removing rigging hardware from service are described according to appropriate BC regulations

3.2 The procedure to remove clips is described as per manufacturer's manual and company procedures.

3.3 The process for removing rigging hardware is described

Must include

1. remove from crane and destroy.

3.4 The process of acceptable repairs to rigging hardware is described as prescribed by manufacturer

Must include

1. nylon sling – no repair
2. wire sling – no repair
3. chain – repair by manufacturer only
4. Kevlar – repair by manufacturer only

3.5 Defects and deficiencies are reported to appropriate personnel

Must include

1. job supervisor
2. crane supervisor
3. enter in crane logbook

Task 4

Demonstrate knowledge to store rigging hardware after use

4.1 Criteria for storing rigging hardware is explained as per manufacturer's guidelines

Unit Standard CR 4.3 K

Rigging
Demonstrate knowledge of types and functions of wire rope and chains - core

Purpose

Demonstrate knowledge of wire rope and chains in crane operations.

Assessment

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Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1

Describe types of wire used in crane operation and their functions.

Performance standards

1.1 Types of wire rope, their characteristics, classifications and uses are described

Must include

1. Ordinary construction
2. Warrington construction
3. Seale construction
4. Filler construction

1.2 Interpret manufacturer's certificate of origin for wire rope

Task 2
Describe grades of chain and their uses in crane operations.

Performance Standards

2.1 Grades of chain and their uses are described

Must include
1. grade 8 for hoisting
2. grade 6 or 7 to tie down loads
3. grade 1000 – pending

2.2 Interpret manufacturer's certificate of origin and capacity tags on chains

Unit Standard CR 4.4 K

Rigging
Demonstrate knowledge of installation, inspection and storage of wire rope - core

Purpose
Demonstrate knowledge of inspection, installation and storage of wire rope for crane operation

Prerequisites
Unit Standard CR 4.1 K Demonstrate knowledge of lifting theory and forces
Unit Standard CR 4.2 K Demonstrate knowledge of rigging hardware, materials and tools
Unit Standard CR 4.3K Demonstrate knowledge of types and functions of wire rope and chains

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
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Task 1
Demonstrate knowledge of the process for inspection and replacement of wire ropes in accordance with manufacturer's recommendations

1.1 The inspection and examination procedure is described for wire rope defects

Must include
1. frayed wire rope
2. broken strands

3. lubrication
4. excessive wear
5. bird caging
6. kinking
7. flattening
8. proper spooling
9. broken wires

1.2 The criteria to remove damaged or defective rope is explained according to WorkSafeBC regulations.

1.3 The process to remove damaged or defective wire rope is described according to manufacturer's guidelines.

1.4 The process to examine the drum to ensure proper installation is described.

1.5 The process to record and report the inspection defects and deficiencies is explained.

Must include
1. record inspection in logbook
2. record defects in logbook
3. report defects and deficiencies to job supervisor
4. report defects and deficiencies to crane supervisor

Task 2
Demonstrate knowledge of installing the new rope according to manufacturer's instructions.

2.1 New wire rope installation process is described according to manufacturer's requirements.

Must include
1. interpretation of manufacturer's certificate of origin/data plates.

2.2 Wire rope system components are identified.

Must include
1. rope guides
2. drums
3. blocks
4. hooks
5. sheaves
6. wedge and socket termination.

Task 3
Demonstrate knowledge of storing wire rope

Performance Standards

3.1 The criteria for storing wire rope are described according to manufacturer's requirements.

Task 4
Demonstrate knowledge of maintenance of wire ropes

Performance Standards

4.1 Criteria for lubricating wire rope are described

Must include
1. inspection of rope
2. identifying rope needing lubrication.

4.2 Procedures to perform maintenance on wire ropes are described as manufacturer dictates

Must include
1. cutting wire ropes
2. cleaning
3. lubrication.

4.3 Record wire rope maintenance in the log book within the regulated timeframe.

Unit Standard CR 4.5 K

Rigging
Demonstrate knowledge of rigging techniques – core

Purpose

Demonstrate knowledge of rigging techniques as they are applied in the workplace

Prerequisites

Unit Standard CR 4.1 K Demonstrate knowledge of lifting theory and forces
Unit Standard CR 4.2 K Demonstrate knowledge of rigging hardware, materials and tools
Unit Standard CR 4.3K Demonstrate knowledge of types and functions of wire rope and chains

Assessment

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Quality Assurance

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Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1

Demonstrate knowledge to assemble appropriate rigging for a given load according to manufacturer's recommendations.

Performance standards

1.1 Appropriate slings and hardware are selected for a given load

Must include
1. determining load weight
2. calculating sling size

3. safe working load (SWL / WLL) of wire rope

1.2 Safe and efficient rigging procedures for a given lift are established

Must include
1. determining load weight
2. calculating sling size
3. safe working load (SWL / WLL) of wire rope.

1.3 Rigging is selected in a safe and efficient manner for a given lift

Must include
1. calculations done
2. safe working load (SWL / WLL) calculated
3. correct sling size.

1.4 Load and hardware characteristics are defined.

Must include
1. advantages and disadvantages of particular hardware
2. characteristics of hardware
3. characteristics of the load.

Unit Standard CR 4.6 W

Rigging
Use rigging hardware and tools in the workplace - core

Purpose

This unit standard allows the trainee to demonstrate the knowledge he has gained by performing rigging activities in the workplace

Prerequisites

Unit Standard CR 4.1 K Demonstrate knowledge of lifting theory and forces
Unit Standard CR 4.2 K Demonstrate knowledge of rigging hardware, materials and tools
Unit Standard CR 4.3K Demonstrate knowledge of types and functions of wire rope and chains
Unit Standard CR 4.4 K Demonstrate knowledge of installation, inspection and storage of wire ropes
Unit Standard CR 4.5 Demonstrate knowledge of rigging techniques

Assessment

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Quality Assurance

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Task 1

Assemble appropriate rigging for a given load according to manufacturer's recommendations.

Performance standards

1.1 Appropriate slings, chains, wire ropes and hardware are selected and installed for lifts: concrete equipment and tanks

Must include

1. measure load
2. calculate weight of load
3. calculate sling requirements
4. complete the appropriate rigging
5. wear protective equipment
6. signal correctly

Task 2

Inspect, maintain and store rigging hardware, wire ropes and chains in workplace operations.

Performance Standards

2.1 Rigging hardware, wire ropes and chains are inspected, maintained and stored according to company and manufacturer's specifications and company requirements

CORE PROGRAM OUTLINE

PROGRAM OUTLINE
FOR
SECTION 5
LOAD CHARTS

SECTION 5 – LOAD CHARTS
Unit Standard CLC 5.1 K

Load Charts
Demonstrate knowledge of determining weight of loads using fundamental math functions and calculations - core

Purpose
This unit provides the basis for determining weigh loads for given lifts by using fundamental math functions and calculations.

Note
A scientific calculator is required for this unit

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
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Task 1
Demonstrate the functions of a scientific calculator to perform mathematical calculations.

Performance standards

1.1 Fundamental mathematical functions are performed.

Must include

1. rounding off
2. fractions
3. metric and imperial units of measure
4. circumference of a circle
5. perimeter of an object
6. surface area of an object
7. Sine of an angle
8. Pythagorean theorem

Task 2
Demonstrate knowledge of accurately calculating load

Performance Standards

2.1 Accurate load weights are determined

Must include

1. volume of an object
2. weight of a cubic unit of an object
3. bearing pressure on the load supporting surfaces
4. weight of materials
5. total weight of load.

Task 3
Demonstrate knowledge of crane documentation affecting loads

Performance Standards

3.1 Engineer's drawings and blueprints are interpreted accurately

Must include

1. capacity
2. boom configuration
3. load weight
4. rigging weight
5. calculations
6. radius of crane
7. positioning of crane
8. positioning of the load

3.2 Shipping company's bill of lading is compared to an estimated weight based on volume, LMI (Load Moment Indicator) and type of load to determine accuracy

3.3 Load capacity charts are interpreted accurately

Unit Standard CLC 5.2 K

Load Charts
Demonstrate knowledge of loading and lifting - core

Purpose
This unit provides the basis for proper loading and lifting.

Prerequisites
Unit Standard CR 4.1 K Demonstrate knowledge of lifting theory and forces
Unit Standard CR 4.2 K Demonstrate knowledge of rigging hardware, materials and tools
Unit Standard CR 4.3K Demonstrate knowledge of types and functions of wire rope and chains
Unit Standard CR 4.5 K Demonstrate knowledge of rigging techniques

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
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and delivery agency policy

Task 1
Demonstrate knowledge to determine sufficient lifting capacity of a crane considering the configuration and attachments required for the lift.

Performance standards

1.1 Fundamentals of leverage are reviewed

1.2 Optimum boom configurations are described

Must include
1. boom length
2. boom angle
3. radius
4. hook height
5. quadrant.

1.3 Configurations appropriate for lifting loads are selected

Must include
1. radius
2. parts of line
3. height of the combined load and rigging
4. weight of the combined load and rigging
5. boom length
6. boom jib combination
7. counterweight combination.

1.4 Configurations for the lifts for the crane are verified by the site supervisor and the crane supervisor

Must include
1. complete lift forms as required by company

1.5 Differences between gross load and gross capacity are described

1.6 Static and dynamic loading and lifting principles are explained

Task 2
Demonstrate knowledge of selection of rigging hardware to safely lift loads in accordance with manufacturer's recommendations

Performance Standards

2.1 Load configurations are accurately determined

Must include
1. calculations for rigging
2. calculations for loads
3. load chart accuracy

2.2 Load height, weight, length and width are verified with crane supervisor

Must include

1. calculations for rigging
2. calculations for loads
3. load chart accuracy

2.3 Centre of gravity for a load is accurately calculated

2.4 The safe working load (SWL / WLL) for wire rope and rigging hardware is accurately calculated and used

Must include
1. prevent overloading
2. prevent spooling

2.5 Criteria for selecting the appropriate hardware are described according to the manufacturer's requirements

Must include
1. weight
2. size of load

2.6 Criteria for selecting the appropriate safety devices are described.

Must include
1. shape
2. weight
3. sharp edges
4. round edges.

2.7 Loads on slings of equal and unequal length are accurately calculated

Must include
1. weight of load
2. centre of gravity
3. sling angles
4. dimension of the load.
    i. height
    ii. weight
    iii. length.

Unit Standard CLC 5.3 W

Load Charts
Interpret load charts and load study drawings to configure crane for workplace operation - core

Purpose

This unit allows for the demonstration of correct crane configuration based on load charts and load study drawings

Prerequisites

Unit Standards CLC 5.1 K Demonstrate knowledge of determining weight loads using fundamental math functions and calculations
Unit Standard CLC 5.2 K Demonstrate knowledge of loading and lifting

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

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Workplace Hazardous Material Information System (WHMIS),
and delivery agency policy

Task 1

Configure crane appropriately after accurately interpreting load charts and lift plan drawings.

Performance standards

1.1 Load charts are interpreted accurately

1.2 Load dimensions are verified by crane supervisor, crane operator (and engineer as required)

1.3 Centre of gravity is calculated

1.4 Special lift instructions are followed

1.5 Safe working loads (SWL / WLL) for wire rope and rigging are determined

1.6 Appropriate hardware and safety devices are selected

1.7 Load on the slings is considered for equal and unequal lengths

CORE PROGRAM OUTLINE

PROGRAM OUTLINE
FOR
SECTION 8
CRANE OPERATIONS

SECTION 8 – CRANE OPERATIONS
Unit Standard CCO 8.1 K

Crane Operations
Demonstrate knowledge of preoperational requirements in crane operations - core

Purpose
This unit provides the knowledge required to do a pre-operational inspection in accordance with manufacturer's recommendations

Prerequisites
All Unit Standards in Sections 1 through 7

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
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and delivery agency policy

Task 1
Demonstrate knowledge of the pre-operational inspection procedures recommended for a mobile crane, a Boom truck, a tower crane and a self erect crane.

Performance Standards

1.1 Inspection procedures are described accurately

Must include

1. operator aids for crane in place
2. inspection and erection reports are completed
3. OH & S requirements followed
4. locate control systems and system gauges
5. according to manufacturer's requirements

1.2 The place, location and verification of operator aids for the crane are described

Must include

1. the LMI
2. boom length indicator (assessment note for Tower Crane and Self Erect Crane)
3. boom angle indicator (see above 1.2 2)

1.3 The completion and filing of inspection and erection reports is described

Must include

1. crane logbook
2. lift plan

Task 2

Demonstrate knowledge of tests, repairs and maintenance required during the pre-operation inspection stage.

Performance Standards

2.1 Function tests on hoist systems are described

Must include

1. boom up
2. boom down (assessment note for Tower Crane and Self Erect Crane)
3. hoist up
4. hoist down
5. swing left
6. swing right
7. scope in (assessment note for Tower and Self Erect)
8. scope out
9. brakes

2.2 Repairs and maintenance prior to operation are described according to manufacturer's requirements and they are entered in the crane logbook

Task 3

Demonstrate knowledge of reports and records required for reporting deficiencies or defects.

Performance Standard

3.1 The process of defects and deficiencies being accurately reported to the supervisor and properly documented in the crane log book is described

Must include

1. date
2. description of issue
3. signature of person doing the repairs
4. signature of the operator
5. legal requirements entries must meet WorkSafeBC regulations, corporate standards, and any other applicable regulatory agencies codes, laws and guidelines.

3.2 The process to ensure repairs and maintenance are recorded in the appropriate crane log book is described

Must include

1. date
2. description
3. signature of repair person

Task 4

Demonstrate knowledge of the setup procedures for a mobile cranes/ boom trucks (assessment note for Tower Crane and Self Erect)

Performance Standards

4.1 Setup procedures are accurately explained according to manufacturer's specifications

4.2 Overhead obstructions and underground hazards are described.

Must include

1. power cables

2. trees
3. underground sewers
4. underground water
5. underground building structures

4.3 The requirements for blocking and mats to be sufficient considering the load requirements and surface conditions to level the crane is described

4.4 Programming and adjusting safety devices to ensure accuracy and safety while lifting

Must include

1. LMI Load moment indicator
2. anti two block systems, high speed limits and max. height limits
3. boom angle indicators
4. level

Unit Standard CCO 8.4 W

Crane Operations
Demonstrate safe crane set up according to manufacturer's instructions – core (Note: Task 4 applies only to mobile cranes)

Purpose
This unit demonstrates a pre-operational inspection of a crane prior to use in accordance with manufacturer's recommendations

Prerequisites
All Knowledge Units in Sections 1 through 7.
Unit Standard CCO 8.1 K Demonstrate knowledge of pre-operational requirements in crane operations
Unit Standard CCO 8.2 K Demonstrate knowledge of crane operations to pick up and carry loads
Unit Standard CCO 8.3 K Demonstrate knowledge to leave a crane unattended

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
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Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Conduct pre-operational inspections as recommended for a mobile crane, a Boom truck, a tower crane and a self erect crane

Performance Standards

1.1 Inspection procedures are accurately followed

Must include

1. operators aids for crane in place
2. inspection and erection reports are completed
3. OH & S requirements followed
4. control systems and system gauges are located
5. manufacturer's requirements

1.2 Operator aids for the crane are in place, located and verified

Must include

1. the LMI
2. boom length indicator
3. boom angle indicator

1.3 All inspection and erection reports are accurately completed and appropriately filed

Must include

1. crane logbook
2. lift plan

Task 2

Perform tests, repairs and maintenance required during the pre-operation inspection stage.

Performance Standards

2.1 Perform function tests on hoist systems

Must include

1. boom up
2. boom down
3. hoist up
4. hoist down
5. swing left
6. swing right
7. scope in
8. scope out

9. brakes

2.2 Perform repairs and maintenance prior to operation according to manufacturer's requirements and they are entered in the crane logbook

Task 3
Complete reports and records required for reporting deficiencies or defects.

Performance Standard

3.1 Defects and deficiencies are accurately reported to the supervisor and properly documented in the crane log book

Must include
1. date
2. description of issue
3. signature of person doing the repairs
4. signature of the operator

3.2 Repairs and maintenance are recorded in the appropriate crane log book

Must include
1. date
2. description of issue
3. signature of person doing the repairs

Task 4 is part of the Advanced Program - Mobile 80 tonnes and under.

CORE PROGRAM OUTLINE

PROGRAM OUTLINE
FOR
SECTION 9
MAINTENANCE & SERVICE

SECTION 9 – MAINTENANCE & SERVICE
Unit Standard CMS 9.1 W

Maintenance & Service
Maintain an equipment logbook to retain a permanent written record of maintenance and repairs

Purpose
This unit provides the correct use of and input to an equipment logbook for cranes.

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
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Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1

Record all inspections and maintenance in an equipment log book

Performance Standards

1.1 All entries are legible and easily understood

1.2 All entries are complete and accurate

1.3 All inspections are accurately recorded when inspection is completed

1.4 All requests for the external supply of maintenance are accurately recorded within

1.5 All maintenance performed is accurately recorded when it is completed

Task 2

Report all inspections, defects, deficiencies, and maintenance to the crane supervisor and site supervisor

Performance Standards

2.1 Communication is clear and understood

2.2 Reports are made at the time of the inspection, request or maintenance.

CORE PROGRAM OUTLINE

SECTION 3
TRAINING PROVIDER STANDARDS

TRAINING PROVIDER STANDARDS

The Crane Core Program is a Competency Based Program of Instruction. This means that the Program Outline defines the Outcomes expected of training, not the inputs, which include time.

By their nature cranes require a one-to-one ratio of student-to-crane to develop the required competence. Industry believes a crane operator becomes competent through building on his or her theoretical knowledge with real world experience.

This program is divided into theoretical and practical components.

The theoretical component is made up of the Knowledge Units, which:

- can be taught in a classroom setting by a qualified instructor (see below)
- delivered on line
- learned through self study on line or through printed materials

The practical component is made up of the Workplace Units, which:

- require hands on experience
- are assessed on the job by a Registered Workplace Assessor
- may be begun in a simulated setting such as a training yard, but are assessed for credit in the workplace

The industry is interested in the outcome of training and is looking for creative responses from the crane training community on how to best deliver training to these standards in a time efficient and cost effective manner. Industry has purposely not set minimum equipment requirements for this reason.

Past training experience in this area has shown consistent training outcomes to these standards in a wide range of times and with a variable mix of on seat equipment time vs. theory instruction time.

With these competence standards industry now has a vehicle for structuring on the job training and wishes to see trainers take advantage of the opportunity on the job training represents. For example, some ideas industry has discussed as options include:

1. Support learners on the job by bringing the trainer to the job site. Crane purchase or rental is not required by the trainer and the learner receives targeted instruction.

2. Deliver instruction in the evenings or on weekends to complement the learner's on the job experience.
3. Deliver targeted theory and practical instruction precisely geared to the standards in this outline – which will ideally guarantee a highly skilled individual to the employer who can demonstrate workplace competence in short order.

Instructor Qualification:

For technical training, instructors must be occupationally competent to run the crane type they are training to, and hold a full scope certificate for the crane type they are training to.

Minimum List of Shop/Laboratory Equipment Required for Crane Common Core

Industry wishes to state no minimum requirement in the interest of permitting training providers maximum flexibility in the options and strategies they may employ in training to these standards, in the case of Knowledge Units, and supporting development of workplace performance in the case of Workplace Units.

BC CRANE OPERATOR PROGRAM OVERVIEW

Section 14.34.1 of the OHS Regulation states: On and after July 1, 2007, a mobile crane, tower crane or boom-truck must be operated only

a) by a person with a valid operator's certificate issued by a person acceptable to the Board, and
b) in accordance with any conditions stipulated on the certificate by the issuing person.

Section 14.34.1 applies to operators of all mobile cranes, boom trucks, and tower cranes with a rated capacity greater than five tonnes or with a boom length greater than 8 metres.
Operator Certification/Qualification for Crane Operators in BC may be obtained to operate each of the following types of cranes:

Mobile Cranes

1. Mobile Lattice Friction (mobile crane)
2. Mobile Hydraulic Unlimited tonnage (mobile crane)
3. Mobile Lattice Hydraulic (mobile crane)
4. Mobile Hydraulic – 80 tonnes and under
5. Mobile Hydraulic – 20 tonnes and under

Boom Trucks

1. Boom Folding 10 tonnes and under
2. Boom Folding 22 tonnes and under
3. Boom Folding unlimited tonnage
4. Boom Stiff 20 tonnes and under
5. Boom Stiff 40 tonnes and under
6. Boom Stiff unlimited tonnage

Tower Cranes

1. Tower Crane
2. Self-Erect Tower Crane

Operator certification is granted for each crane type. A candidate may choose to undertake certification in one or two crane types only or in all crane types. Each crane type requires a course of study, on-job training and the successful completion the operator assessments for that crane type. Certification is granted according to the BC Association for Crane Safety (BCACS) Levels.

The BCACS Levels [1]

Provisional Operator means a person who has passed the theory assessment and is certified to make routine lifts with a minimum of indirect supervision, but will require hands-on, direct supervision for all first time significant lifts and critical lifts. These lifts will be clearly documented by both the operator and the employer. Theory assessments for existing operators who choose to obtain provisional certification will be conducted by the employer. New operators will be required to pass a formal written assessment.. Provisional certification is valid for one year and can be renewed up to three times. A Provisional Certificate will specify what type of crane the operator may operate and their employer. The Provisional Certificate is only valid while working for the identified employer on the certificate. If the operator changes employers, they must submit a change of employer form.

Full Scope Operator means a person who has passed both the theory and practical assessments conducted by a third party assessor for a specific crane type. A Full Scope Certificate will specify what type of crane the operator may operate. This certificate means that the operator is competent to safely perform all crane lifts within the scope of the identified crane type and size. The employer is not identified on this certificate.

[1] From http://www.bcacs.ca/levels.html

Assessors

Third Party Assessor means a person recognized by the BCACS to perform practical assessments. This person must be dedicated to assessing only and not be a trainer of crane operators or otherwise be in any other potential conflict of interest.

Theory Assessment means an assessment administered by the BCACS, conducted on either paper, computer, verbal or other means. These assessments will be delivered through SkilledTradesBC (STBC) and administered by the BCACS.

Practical Assessment means an assessment conducted by a third party assessor approved by the BCACS. The assessment involves spoken questions, as well as the operator using the crane to show that they have the basic knowledge, skills and ability to safely operate the crane. The operator is then considered to be **competent** (having the right skills and knowledge to operate the crane) and will receive written proof. If the operator is found **not yet competent** after performing the practical assessment they would be allowed to continue operating with a Provisional Certificate as decided by the third party assessor. An action plan and a follow-up date will be set following the completion of the assessment. The operator will be informed of this date both verbally and in writing.

The Steps to Qualification
To become a certified crane operator in British Columbia candidates may follow one of two options:

1. Experienced operators who are not yet certified, must challenge the certification process. Some classifications require one to three theory exams before the full scope assessment can be attempted. Other classifications require only the full scope assessment. Operators who are certified in another jurisdiction, must apply to BCACS to have their credential(s) recognized in British Columbia.
2. New crane operators must apply, with their employer, for a provisional certificate and work under supervision until they have met the competency and hour requirements. Upon successful completion of each program candidates will receive their operators certificate as per the above described levels for the particular crane type(s) they are assessed on.

Each course of study and on-job training includes:

1. A mandatory common core program for all crane types.
2. Advanced units of study in each of the individual crane types that build on the common core.

This program is divided into theoretical and practical components.

The theoretical component is made up of the Knowledge Units, which:

- may be taught in a classroom setting by a qualified instructor,
- delivered on line, or
- learned through self study on line or through printed materials

The practical component is made up of the Workplace Units, which:

- require hands on experience
- are assessed on the job by a Registered Workplace Assessor
- may be begun in a simulated setting such as a training yard, but are assessed for credit in the workplace

RECOMMENDED REFERENCE TEXTBOOKS

From the Construction Safety Association of Ontario http://www.csao.org/

Mobile Crane Manual
by Donald E. Dickie, P. Eng., D. H. Campbell, P. Eng.
Construction Safety Association of Ontario ..... SBN 0-8273-6527-6

Rigging Manual
by Donald E. Dickie, P. Eng.
Construction Safety Association of Ontario ..... SBN 0-7726-1574-8

Hoisting and Rigging Safety Manual
Construction Safety Association of Ontario ..... SBN 0-919465-70-6

Slings
Construction Safety Association of Ontario ..... SBN 0-919465-76-5

Safety in Rigging Video/DVD Series

The complete set of 10 *Safety in Rigging* DVDs (FD001-FD010), complete with instructor's notes. Includes:

1. Cranes: Types, Components and Case Histories (FD001)
2. Hazard Awareness in Crane Operating Areas (FD002)
3. International Hand Signals (FD003)
4. Wire Rope (FD004)
5. Hardware (FD005)
6. Chain (FD006)
7. Slings (FD007)
8. Reeving (FD008)
9. Hoists, Winches and Related Devices (FD009)
10. Jacks, Rollers and Related Devices (FD010)

Cranes: Types, Components and Case Histories Video/DVD (set of 10)

From the Operating Engineers Training Institute of Ontario http://www.oetio.com

Mobile Craning Today

Operating Engineers Training Institute of Ontario ..... SBN 0-8273-5460-6

Additional Resources

IPT's Crane and Rigging Handbook
by Ronald G. Garby ..... ISBN 0-920855-14-8

IPT's Crane and Rigging Training Manual
By Ronald G. Garby ..... ISBN 0-920855-16-4

Reference Authority
(to be developed when revised OSH regulations released in Summer 07)

1. WorkSafeBC Occupational Health and Safety (OHS) regulations

2. WorkSafe BC Occupational First Aid Requirements

3. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,

4. ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,

5. ANSI Standard ANSI/SIA A92.2-2001 American National Standard Vehicle-Mounted Elevating and Rotating Aerial Devices

PROGRAM OUTLINE
FOR
SECTION 3

CRANES

SECTION 3 – CRANES
Unit Standard AC 3.5 K

Cranes
Demonstrate knowledge of crane components and attachments (Mobile)

Purpose
Demonstrate knowledge of crane components and attachments

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Demonstrate knowledge of carriers and undercarriages.

Performance standards
1.1 The purpose of carrier and undercarriage components are identified and explained

Must include

1. suspensions
2. car body
3. wheels
4. tires
5. tracks
6. sprocket idlers
7. travel chains
8. hydraulic motors

1.2 Defects and malfunctions that can occur on the carrier and undercarriage are described (Mobile)

Must include

1. cracked frame
2. cracked welds
3. broken drive line shafts
4. damaged wheels
5. damaged differentials
6. tires
7. tracks
8. track pads
9. rollers

Task 2

Demonstrate knowledge of outrigger and stabilizing equipment (Mobile)

2.1 The function of outrigger and stabilizing equipment are identified and explained

Must include

1. outrigger beams
2. outrigger jacks
3. outrigger pads
4. retaining pins
5. hydraulic hoses

Task 3

Demonstrate knowledge of the turntable on a variety of cranes (All Mobile)

3.1 Components of a turntable

Must include
1. bearing
2. hook rollers
3. bolts

3.2 The function of turntable components are identified and explained

Must include
1. bearing
2. hook rollers
3. bolts

3.3 Defects and malfunctions of the turntable components are described

Must include
1. loose bolts
2. structural cracks
3. distortions to the turntable
4. damage to the turntable

Task 4
Demonstrate knowledge of attachments for cranes (Mobile)

4.1 Attachments for cranes are listed.

Must include
1. boom extensions
2. boom stabilizers
3. jibs
4. boom dolly
5. elevated work platforms (e.g. personnel basket)
6. heavy lift attachments
7. dragline and bucket
8. clam bucket
9. drilling unit
10. pile driving unit
11. extraction unit

4.2 Functions for attachments are identified and explained (Mobile)

Must include

1. boom extensions
2. boom stabilizers
3. jibs
4. boom dolly
5. elevated work platforms
6. heavy lift attachments
7. dragline and bucket
8. clam bucket
9. drilling unit
10. pile driving unit
11. extraction unit

4.3 Defects or malfunctions of an attachment are explained

Must include

1. boom extensions
2. boom stabilizers
3. jibs
4. boom dolly
5. elevated work platforms
6. heavy lift attachments
7. dragline and bucket
8. clam bucket
9. drilling unit
10. pile driving unit
11. extraction unit

Task 5

Demonstrate knowledge of crane safety components, devices and aids

5.1 The safety component devices and aids and their functions for boom trucks and mobile cranes are described

Must include

1. safety guards
2. covers
3. Load Moment Indicator (LMI)
4. anti-two block devices

5. boom length indicators
6. boom angle indicator

5.2 On-board crane operator aids and their functions are introduced and briefly described

Must include
1. load charts
2. operators' manuals
3. operator log book

5.3 Programming the Load Moment Indicator is explained

5.4 Defects or malfunctions of safety devices, components and aids are described.

Must include
1. safety guards
2. covers
3. Load Moment Indicator (LMI)
4. anti-two block devices
5. boom length indicators
6. boom angle indicator.

5.6 Actions to take when safety devices malfunction are explained

Must include
1. report to job supervisor
2. report to crane or equipment supervisor
3. enter in logbook
4. stop or continue depending on seriousness.

Unit Standard AC 3.6 K

Cranes
Demonstrate knowledge of engines and ancillary systems - mobile

Purpose
Demonstrate knowledge of crane engines and ancillary systems

Prerequisite
Unit Standard CC 3.1 K Demonstrate knowledge of cranes and classifications
Unit Standard AC 3.5 K Demonstrate knowledge of crane components and attachments

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Demonstrate knowledge of crane engines and electric motors on mobile cranes

Performance standards

1.1 The components of electrical, diesel and gas power plants are listed and their functions described

Must include

1. block
2. piston
3. connecting rod
4. camshaft
5. rotors
6. stators
7. fuel injectors
8. fuel pumps
9. electric motors
10. limit switches.

1.2 Defects or malfunctions of power plants are described for components

Must include

1. block
2. piston
3. connecting rod
4. camshaft
5. rotors
6. stators
7. fuel injectors
8. fuel pumps
9. electric motors
10. limit switches.

Task 2

Demonstrate knowledge of crane drive systems for boom trucks and mobile cranes

Performance standards

2.1 The components of the drive system are explained and their functions described

Must include

1. clutch
2. transmission
3. differentials
4. power take-offs
5. hydraulic motors
6. electric motors

2.2 Defects or malfunctions of drive system components are described

Must include

1. clutch
2. transmission
3. differentials
4. power take-offs
5. hydraulic motors
6. electric motors

Unit Standard AC 3.7 K

Cranes
Demonstrate knowledge of power transfer for cranes - mobile

Purpose
Demonstrate knowledge of power transfer including pneumatic, hydraulic, electrical, steering and braking.

Prerequisite
Unit Standard CC 3.1 K Demonstrate knowledge of cranes and classifications
Unit Standard AC 3.5 K Demonstrate knowledge of crane components and attachments
Unit Standard AC 3.6 K Demonstrate knowledge of engines and ancillary systems

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Demonstrate knowledge of pneumatic systems in crane operations.

Performance standards

1.1 Components of pneumatic systems are described and their functions explained

Must include
1. air brakes
2. horn
3. seats
4. boom locks
5. boom pawls
6. air control levers.

1.2 Defects or malfunctions of pneumatic systems are described

Must include
1. air brakes
2. horn
3. seats
4. boom locks
5. boom pawls
6. air control levers.

Task 2

Demonstrate knowledge of hydraulic systems in crane operations.

Performance standards

2.1 Components of hydraulic systems are described and their functions explained

Must include
1. hydraulic fluid
2. filters
3. lines
4. pumps
5. motors
6. fittings
7. hydraulic control levers.

2.2 Defects or malfunctions of pneumatic systems are described.

Must include

1. hydraulic fluid
2. filters
3. lines
4. pumps
5. motors
6. fittings
7. hydraulic control levers.

Task 3

Demonstrate knowledge of electrical systems in crane operations.

Performance standards

3.1 Components of electrical systems are described and their functions explained

Must include

1. alternator
2. starter
3. regulator
4. wiring
5. fuses
6. generator
7. electric motor
8. limit switches

3.2 Defects or malfunctions of electrical systems are described.

Must include

1. alternator
2. starter
3. regulator
4. wiring
5. fuses
6. generator
7. electric motor

8. limit switches.

Task 4

Demonstrate knowledge of steering system components in crane operations.

Performance standards

4.1 Components of steering systems are described and their functions explained

Must include

1. axles
2. tie rods
3. steering box
4. sliding jaw clutch
5. ball joints
6. walking beam

4.2 Defects or malfunctions of steering systems are described

Must include

1. axles
2. tie rods
3. steering box
4. sliding jaw clutch
5. ball joints
6. walking beam

Task 5

Demonstrate knowledge of travel braking systems in crane operations.

Performance standards

5.1 Components of the braking systems are described and their functions explained

Must include

6. air compressor
7. brake chambers
8. drums

9. brake bands
10. slack adjusters

5.2 Defects or malfunctions of braking systems are described

Must include

6. air compressors
7. brake chambers
8. drums
9. brake bands
10. slack adjusters

Unit Standard AC 3.11 K

Cranes

Demonstrate knowledge of crane components and attachments for boom trucks with folding booms (unlimited tonnage)

Purpose

Demonstrate knowledge of folding boom crane components and attachments

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CSA Standard Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS), and delivery agency policy

Task 1

Demonstrate knowledge of carriers and undercarriages.

Performance standards

1.1 The purpose of truck and undercarriage components are identified and explained

Must include
1. suspensions
2. wheels
3. tires
4. travel chains
5. hydraulic motors

1.2 Defects and malfunctions that can occur on the truck and undercarriage are described

Must include
1. cracked frame
2. cracked welds
3. broken drive line shafts
4. damaged wheels
5. damaged differentials
6. tires

Task 2
Demonstrate knowledge of outrigger and stabilizing equipment

2.1 The functions of outrigger and stabilizing equipment are identified and explained

Must include
1. outrigger beams
2. outrigger jacks
3. outrigger pads
4. retaining pins
5. hydraulic hoses

Task 3
Demonstrate knowledge of the turntable on a variety of cranes

3.1 Components of a turntable and turret

Must include
1. bearing
2. bolts

3.2 The function of turntable components are identified and explained

Must include
1. bearing
2. bolts

3.3 Defects and malfunctions of the turntable or turret components are described

Must include
1. loose bolts
2. structural cracks
3. distortions to the turntable or turret
4. damage to the turntable or turret

Task 4
Demonstrate knowledge of crane safety components, devices and aids

4.1 The safety component devices and aids and their functions for boom trucks are described

Must include
1. safety guards
2. covers
3. Load Moment Indicator (LMI)
4. anti-two block devices (when hoist is installed)
   boom length indicators
5. boom angle indicator

4.2 On-board crane operator aids and their functions are introduced and briefly described

Must include
1. load charts
2. operators' manuals
3. operator log book

4.3 Programming the Load Moment Indicator is explained

4.4 Defects or malfunctions of safety devices, components and aids are described.

Must include

1. safety guards
2. covers
3. Load Moment Indicator (LMI)
4. anti-two block devices (when hosithoist is installed)
5. boom length indicators
6. boom angle indicator.

Must include

1. report to job supervisor
2. report to crane or equipment supervisor
3. enter in logbook
4. stop or continue with appropriate precautions depending on seriousness.

Unit Standard AC 3.12 K

Cranes

Demonstrate knowledge of engines and ancillary systems on boom trucks with folding booms (unlimited tonnage)

Purpose

Demonstrate knowledge of crane engines and ancillary systems

Prerequisite

Core Unit Standards CC 3.1 K, CC 3.2 K, CC 3.3 K and CC 3.4 K
Unit Standard AC 3.11 K Demonstrate knowledge of crane components and attachments for boom trucks with folding booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS), and company policy

Task 1
Demonstrate knowledge of crane engines on boom trucks.

Performance standards

1.1 The components of electrical, diesel and gas power plants are listed and their functions described

Must include
1. block
2. piston
3. connecting rod
4. camshaft
5. fuel injectors
6. fuel pumps
7. limit switches.

1.2 Defects or malfunctions of power plants are described for components

Must include
1. block
2. piston
3. connecting rod
4. camshaft
5. fuel injectors
6. fuel pumps
7. limit switches.

Task 2
Demonstrate knowledge of crane drive systems for boom trucks.

Performance standards

2.1 The components of the drive system are explained and their functions described

Must include

1. clutch
2. transmission
3. differentials
4. power take-offs
5. hydraulic motors

2.2 Defects or malfunctions of drive system components are described

Must include

1. clutch
2. transmission
3. differentials
4. power take-offs
5. hydraulic motors

Unit Standard AC 3.13 K

Cranes

Demonstrate knowledge of power transfer for boom trucks with folding booms (unlimited tonnage)

Purpose

Demonstrate knowledge of power transfer including pneumatic, hydraulic, electrical, steering and braking.

Prerequisite

Core Unit Standards CC 3.1 K, CC 3.2 K, CC 3.3 K and CC 3.4 K
Unit Standard AC 3.11 K Demonstrate knowledge of crane components and attachments for boom trucks with folding booms (unlimited tonnage)
Unit Standard AC 3.12 K Demonstrate knowledge of engines and ancillary systems for boom trucks with folding booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS), and delivery agency policy

Task 1

Demonstrate knowledge of pneumatic systems in crane operations.

Performance standards

1.1 Components of pneumatic systems are described and their functions explained

Must include

1. air brakes
2. horn
3. seats
4. air control levers.

1.2 Defects or malfunctions of pneumatic systems are described

Must include

1. air brakes
2. horn
3. seats
4. air control levers.

Task 2

Demonstrate knowledge of hydraulic systems in crane operations.

Performance standards

2.1 Components of hydraulic systems are described and their functions explained

Must include

1. hydraulic fluid
2. filters
3. lines
4. pumps
5. motors
6. fittings
7. hydraulic control levers.

2.2 Defects or malfunctions of pneumatic systems are described .

Must include
1. hydraulic fluid
2. filters
3. lines
4. pumps
5. motors
6. fittings
7. hydraulic control levers.

Task 3

Demonstrate knowledge of electrical systems in boom crane operations.

Performance standards

3.1 Components of electrical systems are described and their functions explained

Must include
1. alternator
2. starter
3. regulator
4. wiring
5. fuses
6. generator
7. limit switches

3.2 Defects or malfunctions of electrical systems are described .

Must include
1. alternator
2. starter
3. regulator
4. wiring
5. fuses
6. generator
7. limit switches.

Task 4

Demonstrate knowledge of steering system components in boom crane operations.

Performance standards

4.1 Components of steering systems are described and their functions explained

Must include
1. axles
2. tie rods
3. steering box
4. sliding jaw clutch
5. ball joints
6. walking beam

4.2 Defects or malfunctions of steering systems are described

Must include
1. axles
2. tie rods
3. steering box
4. sliding jaw clutch
5. ball joints
6. walking beam

Task 5

Demonstrate knowledge of travel braking systems in boom crane operations.

Performance standards

5.1 Components of the braking systems are described and their functions explained

Must include
1. air compressor
2. brake chambers
3. drums
4. brake bands
5. slack adjusters

5.2 Defects or malfunctions of braking systems are described

Must include
1. air compressors
2. brake chambers
3. drums
4. brake bands
5. slack adjusters

Unit Standard AC 3.17 K

Cranes

Demonstrate knowledge of crane components and attachments for boom trucks with Stiff booms (unlimited tonnage)

Purpose

Demonstrate knowledge of stiff boom crane components and attachments

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1

Demonstrate knowledge of carriers and undercarriages.

Performance standards

1.1 The purpose of truck and undercarriage components are identified and explained

Must include
1. suspensions
2. wheels
3. tires
4. travel chains
5. hydraulic motors

1.2 Defects and malfunctions that can occur on the truck and undercarriage are described

Must include
1. cracked frame
2. cracked welds
3. broken drive line shafts
4. damaged wheels
5. damaged differentials
6. tires

Task 2
Demonstrate knowledge of outrigger and stabilizing equipment

2.1 The functions of outrigger and stabilizing equipment are identified and explained

Must include
1. outrigger beams
2. outrigger jacks
3. outrigger pads
4. retaining pins
5. hydraulic hoses

Task 3

Demonstrate knowledge of the turntable and turret on a variety of boom trucks

3.1 Components of a turntable and turret

Must include
1. bearing
2. bolts

3.2 The function of turntable/ turret components are identified and explained

Must include
1. bearing
2. bolts

3.3 Defects and malfunctions of the turntable / turret components are described

Must include
1. loose bolts
2. structural cracks
3. distortions to the turntable and turret
4. damage to the turntable and turret

Task 4
Demonstrate knowledge of attachments for boom trucks with stiff booms

4.1 Attachments for boom trucks are listed.

Must include
1. boom extensions
2. jibs
3. elevated work platforms (e.g. personnel basket)

4.2 Functions for attachments are identified and explained

Must include
1. boom extensions
2. jibs
3. elevated work platforms (e.g. personnel basket)

4.3 Defects or malfunctions of an attachment are explained

Must include
1. boom extensions
2.
3. jibs

Task 5
Demonstrate knowledge of crane safety components, devices and aids for boom trucks.

5.1 The safety component devices and aids and their functions for boom trucks are described

Must include
1. safety guards
2. covers
3. Load Moment Indicator (LMI)
4. anti-two block devices
5. boom length indicators
6. boom angle indicator

5.2 On-board crane operator aids and their functions are introduced and briefly described

Must include
1. load charts
2. operators' manuals
3. operator log book

5.3 Programming the Load Moment Indicator is explained

5.4 Defects or malfunctions of safety devices, components and aids are described.

Must include
1. safety guards
2. covers
3. Load Moment Indicator (LMI)
4. anti-two block devices
5. boom length indicators
6. boom angle indicator.

5.6 Actions to take when safety devices malfunction are explained

Must include
1. report to job supervisor
2. report to crane or equipment supervisor
3. enter in logbook
4. stop or continue with appropriate precautions depending on seriousness.

Unit Standard AC 3.18 K

Cranes

Demonstrate knowledge of engines and ancillary systems on boom trucks with stiff booms (unlimited tonnage)

Purpose

Demonstrate knowledge of boom truck engines and ancillary systems

Prerequisite

Core Unit Standards CC 3.1 K, CC 3.2 K, CC 3.3 K and CC 3.4 K
Unit Standard AC 3.17 K Demonstrate knowledge of crane components and attachments for boom trucks with stiff booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Demonstrate knowledge of drive engines on boom trucks.

Performance standards

1.1 The components of diesel and gas power plants are listed and their functions described

Must include

1. block
2. piston
3. connecting rod
4. camshaft
5. fuel injectors
6. fuel pumps
7. limit switches.

1.2 Defects or malfunctions of boom truck power plants are described for components

Must include

1. block
2. piston
3. connecting rod
4. camshaft
5. fuel injectors
6. fuel pumps
7. limit switches.

Task 2
Demonstrate knowledge of crane drive systems for boom trucks.

Performance standards

2.1 The components of the drive system are explained and their functions described

Must include

1. clutch
2. transmission
3. differentials
4. power take-offs
5. hydraulic motors

2.2 Defects or malfunctions of drive system components are described

Must include

1. clutch
2. transmission
3. differentials
4. power take-offs
5. hydraulic motors

Unit Standard AC 3.19 K

Cranes

Demonstrate knowledge of power transfer for boom trucks with stiff booms (unlimited tonnage)

Purpose

Demonstrate knowledge of power transfer including pneumatic, hydraulic, electrical, steering and braking.

Prerequisite

Core Unit Standards CC 3.1 K, CC 3.2 K, CC 3.3 K and CC 3.4 K
Unit Standard AC 3.17 K Demonstrate knowledge of crane components and attachments for boom trucks with stiff booms (unlimited tonnage)
Unit Standard AC 3.18 K Demonstrate knowledge of engines and ancillary systems for boom trucks with stiff booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1

Demonstrate knowledge of pneumatic systems in boom truck operations.

Performance standards

1.1 Components of pneumatic systems are described and their functions explained

Must include

1. air brakes
2. horn
3. seats
4. boom locks
5. boom pawls
6. air control levers.

1.2 Defects or malfunctions of pneumatic systems are described

Must include

1. air brakes
2. horn
3. seats
4. boom locks
5. boom pawls
6. air control levers.

Task 2

Demonstrate knowledge of hydraulic systems in boom truck operations.

Performance standards

2.1 Components of hydraulic systems are described and their functions explained

Must include

1. hydraulic fluid
2. filters
3. lines
4. pumps
5. motors
6. fittings
7. hydraulic control levers.

2.2 Defects or malfunctions of pneumatic systems are described.

Must include
1. hydraulic fluid
2. filters
3. lines
4. pumps
5. motors
6. fittings
7. hydraulic control levers.

Task 3

Demonstrate knowledge of electrical systems in crane operations.

Performance standards

3.1 Components of electrical systems are described and their functions explained

Must include
1. alternator
2. starter
3. regulator
4. wiring
5. fuses
6. generator
7. electric motor
8. limit switches

3.2 Defects or malfunctions of electrical systems are described.

Must include
1. alternator
2. starter
3. regulator
4. wiring
5. fuses
6. generator
7. electric motor
8. limit switches.

Task 4

Demonstrate knowledge of steering system components on boom trucks.

Performance standards

4.1 Components of steering systems are described and their functions explained

Must include

1. axles
2. tie rods
3. steering box
4. ball joints
5. walking beam

4.2 Defects or malfunctions of steering systems are described

Must include

1. axles
2. tie rods
3. steering box
4. ball joints
5. walking beam

Task 5

Demonstrate knowledge of travel braking systems in boom truck operations.

Performance standards

5.1 Components of the braking systems are described and their functions explained

Must include

6. air compressor
7. brake chambers
8. drums
9. brake bands
10. slack adjusters

5.2 Defects or malfunctions of braking systems are described

Must include

1. air compressors
2. brake chambers
3. drums
4. brake bands
5. slack adjusters

PROGRAM OUTLINE
FOR
SECTION 6

TRANSPORTATION & DELIVERY

SECTION 6 – TRANSPORTATION & DELIVERY
Unit Standard ATD 6.1 K

Transportation & Delivery
Demonstrate knowledge of the BC Ministry of Transportation – Commercial Transport rules and regulations as they pertain to the transportation of cranes - mobile

Purpose
This unit provides the knowledge required to transport a crane in accordance with the BC Ministry of Transportation – Commercial Transport regulations.

Prerequisites
Unit Standard CC 3.1 K Demonstrate knowledge of types of cranes and classifications

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS), Insurance Corporation of BC (ICBC) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
Insurance Corporation of BC (ICBC)
BC Ministry of Transportation – Commercial Transport regulations and delivery agency policy
Commercial Vehicle Safety Enforcement

Task 1

Demonstrate knowledge of legislation and regulations to travel or transport a crane on public highways according to the BC Ministry of Transportation - Commercial Transport Regulations

Performance standards

1.1 Related sections of the BC Ministry of Transportation - Commercial Transport Regulations are located and explained for the travel and transportation of boom trucks, mobile cranes and components

1.2 Criteria for special permits for travel or transportation of a crane on a public highway are described

Must include

1. overall height
2. overall weight
3. overall length
4. total axle weight

Unit Standard ATD 6.2 K

Transportation & Delivery
Demonstrate knowledge to prepare and to transport a mobile crane - mobile

Purpose
This unit provides the knowledge to prepare and to transport a mobile crane

Prerequisites
Unit Standard CC 3.1 K Demonstrate knowledge of types of cranes and classifications
Unit Standard ATD 6.2 K Demonstrate knowledge of the BC Ministry of Transportation - Commercial Transport Regulations, as they pertain to the transportation of cranes

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS), Insurance Corporation of BC (ICBC) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
Insurance Corporation of BC (ICBC)
BC Ministry of Transportation – Commercial Transport regulations and delivery agency policy

Task 1

Demonstrate knowledge to prepare a crane and components for highway travel on a transporter in accordance with manufacturer's recommendations and the BC Ministry of Transportation - Commercial Transport Regulations.

Performance standards

1.1 The requirements of a transporter to transport a crane on public highways are explained

Must include

1. ramps
2. decking
3. 2 pieces of planking (for outriggers)
4. flags
5. lights
6. permits
7. wheel chocks

1.2 The structural integrity and capacity to transport the crane and components are described.

Must include

1. weight carrying capacity
2. operational levers
3. goose neck
4. glad hands
5. electrical connections
6. inspection stickers
7. ownership papers
8. permits

1.3 The procedures for correctly preparing the crane for transporter travel are explained.

Must include

1. swing/away lattice extension stowed
2. retract the boom
3. lower boom into cradle
4. apply swing brake and house lock
5. secure hook to tie down
6. retract and pin outrigger beam
7. remove outrigger pads

1.4 Requirements to safely load and secure a crane and components on a transporter displaying correct and serviceable signage and signals are explained.

Must include

1. manufacturer's procedures
2. BC Ministry of Transportation - Commercial Transport Regulations
3. flags
4. flashers
5. warning signs.

1.5 Verification of permits for the crane and transporter are explained.

Must include

1. correct permit present for crane being transported

Task 2

Demonstrate knowledge to safely unload a crane and components from a transporter.

Performance standards

2.1 Requirements to unload a crane and components from a transporter are correctly explained.

Must include

1. blocking
2. rigging
3. ramps

Task 3

Demonstrate knowledge to prepare a rubber-tired crane for highway travel on a transporter in accordance with manufacturer's recommendations and the BC Ministry of Transportation - Commercial Transport Regulations.

Performance standards

3.1 The procedure to prepare a rubber-tired crane for travel is explained

Must include:

1. swing/away lattice extension stowed
2. retract the boom
3. lower boom into cradle
4. use boom dolly, if applicable
5. apply swing brake and house lock
6. secure hook to tie down
7. retract and pin outrigger beam
8. remove outrigger pads if required

3.2 Securing the components and/or loads on rubber-tired cranes to prevent shifting during travel are explained.

Must Include:

1. manufacturer's procedures
2. BC Ministry of Transportation - Commercial Transport Regulations
3. flags
4. flashers
5. warning signs

3.3 Verification of all permits for rubber-tired crane travel on a public highway is explained.

Must include:

1. correct permit present for crane being transported

Unit Standard ATD 6.3 K

Transportation & Delivery
Demonstrate knowledge to assemble and disassemble a crane at a worksite – mobile

Purpose
This unit provides the knowledge to assemble and disassemble a crane at a worksite

Prerequisites
Unit Standard CC 3.1 K Demonstrate knowledge of types of cranes and classifications

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS), Insurance Corporation of BC (ICBC) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
Insurance Corporation of BC (ICBC)
BC Ministry of Transportation – Commercial Transport regulations and delivery agency policy

Task 1

Demonstrate knowledge to assemble a crane in accordance with manufacturer's recommendations.

Performance standards

1.1 Procedures to assemble cranes are explained

Must include

1. attachments
2. counter weights
3. booms
4. undercarriage adjustments
5. boom dollies.

1.2 Process to check the area to be used for crane assembly is secure and free of obstructions is described

Must include

1. overhead wires
2. overhead obstructions
3. underground services
4. level site

1.3 Positioning the crane in accordance with the site assembly plan is described.

Must include

1. area is large enough for assembly
2. proper radius for loading and unloading the load
3. site is level

Task 2

Demonstrate knowledge to disassemble a crane in accordance with manufacturer's recommendations.

Performance standards

1.1 Procedures to disassemble cranes are explained

Must include

1. attachments
2. counter weights
3. booms
4. undercarriage adjustments
5. boom dollies

1.2 Process to check the area to be used for crane disassembly is secure and free of obstructions is described

Must include

1. overhead wires
2. overhead obstructions
3. underground services
4. level site

1.3 Positioning the crane in accordance with the site disassembly plan is described.

Must include

1. area is large enough for assembly
2. proper radius for loading and unloading the load
3. site is level

Unit Standard ATD 6.4 W

Transportation & Delivery
Prepare and transport a mobile crane to a worksite following all Highway and traffic rules and regulations - mobile

Purpose
This unit provides the demonstration of skills required to prepare and transport a mobile crane to a worksite

Prerequisites
Unit Standard ATD 6.1 K Demonstrate knowledge of the BC Ministry of Transportation – Commercial Transport regulations as they pertain to the transportation of cranes
Unit Standard ATD 6.2 K Demonstrate knowledge to prepare and to transport a mobile crane

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS), Insurance Corporation of BC (ICBC) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
Insurance Corporation of BC (ICBC)
BC Ministry of Transportation – Commercial Transport regulations and delivery agency policy

Task 1

Prepare crawler cranes and rubber-tired cranes and components for highway travel following manufacturer's recommendations and the BC Ministry of Transportation - Commercial Transport Regulations

Performance Standards

1.1 The crane and components are safely loaded and secured for transporter travel displaying correct and serviceable signage and signals

Must include

1. manufacturer's recommendations
2. BC Ministry of Transportation - Commercial Transport Regulations
3. transporter structural integrity and capacity
4. flags
5. flashers
6. warning signals
7. permit verification

Unit Standard ATD 6.5 W

Transportation & Delivery
Assemble and disassemble a crane at a worksite - mobile

Purpose
This unit provides the knowledge to assemble and disassemble a crane at a worksite

Prerequisite
Unit Standard ATD 6.3K Demonstrate knowledge to assemble and disassemble a crane at a worksite

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS), Insurance Corporation of BC (ICBC) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
Insurance Corporation of BC (ICBC)
BC Ministry of Transportation – Commercial Transport regulations and delivery agency policy

Task 1
Assemble a crane in accordance with manufacturer's recommendations in an area that is secure and free of obstructions.

Performance standards

1.1 Crane is assembled correctly

Must include
1. attachments
2. counter weights
3. booms
4. undercarriage adjustments
5. boom dollies.

1.2 Area is secure and free of obstruction

Must include
1. overhead wires
2. overhead obstructions
3. underground services
4. level site.

1.3 The crane is positioned in accordance with the site assembly plan

Must include
1. area is large enough for assembly
2. proper radius for loading and unloading the load
3. site is level

Task 2
Disassemble a crane in accordance with manufacturer's recommendations.

Performance standards

2.1 Crane is disassembled correctly

Must include
1. attachments
2. counter weights
3. booms
4. undercarriage adjustment
5. boom dollies

2.2 Area to be used for crane disassembly is secure and free of obstruction

Must include

1. overhead wires
2. overhead obstructions
3. underground services
4. level site.

Unit Standard ATD 6.8 K

Transportation & Delivery

Demonstrate knowledge of the BC Ministry of Transportation – Commercial Transport rules and regulations as they pertain to highway transportation of boom trucks with folding booms (unlimited tonnage)

Purpose

This unit provides the knowledge required to transport a crane in accordance with the BC Ministry of Transportation – Commercial Transport regulations.

Prerequisites

Unit Standard CC 3.1 K Demonstrate knowledge of types of cranes and classifications
Unit Standard AC 3.9 K Demonstrate knowledge of components and attachments for boom trucks with folding cranes (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)
Insurance Corporation of BC (ICBC) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,

Workplace Hazardous Material Information System (WHMIS)
Insurance Corporation of BC (ICBC)
BC Ministry of Transportation – Commercial Transport regulations and delivery agency policy
Commercial Vehicle Safety Enforcement

Task 1

Demonstrate knowledge of legislation and regulations to drive a boom truck with a folding boom on public highways according to the BC Ministry of Transportation - Commercial Transport Regulations

Performance standards

1.1 Related sections of the BC Ministry of Transportation - Commercial Transport Regulations are located and explained for the travel and transportation of boom trucks.,

1.2 Criteria for special permits for travel or transportation of a boom truck on a public highway are described

Must include

1. overall height
2. overall weight
3. overall length
4. total axle weight

Unit Standard ATD 6.9 K

Transportation & Delivery

Demonstrate knowledge to prepare a boom truck with a folding boom (unlimited tonnage) for highway/road travel

Purpose

This unit provides the knowledge to prepare a boom truck with a folding boom (unlimited tonnage) for travel to a worksite

Prerequisites

Unit Standard CC 3.1 K Demonstrate knowledge of types of cranes and classifications
Unit Standard ATD 6.8 K Demonstrate knowledge of the BC Ministry of Transportation - Commercial Transport Regulations, as they pertain to the transportation of cranes

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)
Insurance Corporation of BC (ICBC) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
Insurance Corporation of BC (ICBC)
BC Ministry of Transportation – Commercial Transport regulations and delivery agency policy

Task 1

Demonstrate knowledge to prepare a boom truck with a folding boom (unlimited tonnage) and its components for highway travel in accordance with manufacturer's recommendations and the BC Ministry of Transportation - Commercial Transport Regulations.

Performance standards

1.1 The requirements to drive a boom truck with a folding boom (unlimited tonnage) and its components on public highways are explained

Must include

1. ramps
2. decking
3. 2 pieces of planking (for outriggers)
4. flags
5. lights
6. permits
7. wheel chocks

1.2 The procedure for correctly preparing the boom truck with a folding boom (unlimited tonnage) and its components for driving are explained.

Must include

1. retract the boom
2. apply swing brake and lock
3. secure hook to tie down
4. retract and pin outrigger beam
5. remove outrigger pads

1.3 Requirements to safely secure the boom truck with a folding boom (unlimited tonnage) and its components displaying correct and serviceable signage and signals are explained.

Must include

1. manufacturer's procedures
2. BC Ministry of Transportation - Commercial Transport Regulations
3. flags
4. flashers
5. warning signs.

1.4 Verification of permits for the boom truck with a folding boom (unlimited tonnage) and its load are explained.

Must include

1. correct permit present for boom truck and load being transported where applicable.

Unit Standard ATD 6.12 K

Transportation & Delivery

Demonstrate knowledge of the BC Ministry of Transportation – Commercial Transport rules and regulations as they pertain to highway transportation of boom trucks with stiff booms (unlimited tonnage)

Purpose

This unit provides the knowledge required to drive a boom truck in accordance with the BC Ministry of Transportation – Commercial Transport regulations.

Prerequisites

Unit Standard CC 3.1 K Demonstrate knowledge of types of cranes and classifications
Unit Standard AC 3.9 K Demonstrate knowledge of components and attachments for boom trucks with stiff cranes (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)
Insurance Corporation of BC (ICBC) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,

ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
Insurance Corporation of BC (ICBC)
BC Ministry of Transportation – Commercial Transport regulations and delivery agency policy
Commercial Vehicle Safety Enforcement

Task 1

Demonstrate knowledge of legislation and regulations to drive a boom truck with a stiff boom on public highways according to the BC Ministry of Transportation - Commercial Transport Regulations

Performance standards

1.1 Related sections of the BC Ministry of Transportation - Commercial Transport Regulations are located and explained for the travel and transportation of boom trucks.,

1.2 Criteria for special permits for travel or transportation of a crane on a public highway are described

Must include

1. overall height
2. overall weight
3. overall length
4. total axle weight

Unit Standard ATD 6.13 K

Transportation & Delivery

Demonstrate knowledge prepare a boom truck with a stiff boom (unlimited tonnage) for highway/road travel

Purpose

This unit provides the knowledge to prepare a boom truck with a stiff boom (unlimited tonnage) for highway/road travel to a worksite.

Prerequisites

Unit Standard CC 3.1 K Demonstrate knowledge of types of cranes and classifications
Unit Standard ATD 6.12 K Demonstrate knowledge of the BC Ministry of Transportation - Commercial Transport Regulations, as they pertain to the transportation/driving of boom trucks with a stiff boom (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)
Insurance Corporation of BC (ICBC) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CSA Standard Z150-98 (R2004) Safety Code for Mobile Cranes,

ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS),
Insurance Corporation of BC (ICBC)
BC Ministry of Transportation – Commercial Transport regulations and delivery agency policy

Task 1

Demonstrate knowledge to prepare a boom truck with a stiff boom (unlimited tonnage) and its components for highway travel in accordance with manufacturer's recommendations and the BC Ministry of Transportation - Commercial Transport Regulations.

Performance standards

1.1 The requirements to drive a boom truck with a folding boom 22 tonnes and under on public highways are explained

Must include

1. flags
2. lights
3. permits
4. wheel chocks

1.2 The procedure for correctly preparing the boom truck with a folding boom 22 tonnes for driving are explained.

Must include

1. retract the boom
2. apply swing brake and lock
3. secure hook to tie down
4. retract and pin outrigger beam
5. remove outrigger pads

1.3 Verification of permits for the boom truck with a folding boom 22 tonnes and under and its load are explained.

Must include

1. correct permit present for boom truck and load being transported where applicable.

PROGRAM OUTLINE
FOR
SECTION 7

SITE PLANNING & CRANE POSITIONING

SECTION 7 – SITE PLANNING & CRANE POSITIONING
Unit Standard ASPCP 7.1 K

Site Planning & Crane Positioning
Demonstrate knowledge of accurate site assessment tools - mobile

Purpose
This unit provides the knowledge required to assess a site accurately in order to operate a mobile crane

Prerequisite
Unit Standard CL 5.2 K Demonstrate knowledge of loading and lifting

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Demonstrate knowledge of lift plans

Performance standards

1.1 The purpose of site blue prints and engineering drawings in preparing lift plans is explained

Must include

1. structural integrity of the area
2. placement of load
3. placement of crane

1.2 The elements of a standard lift plan are described

Must include

1. routine to move load
2. signal person
3. radio/hand signals
4. signed by operator
5. signed by supervisor

Unit Standard ASPCP 7.2 K

Site Planning & Crane Positioning
Demonstrate knowledge to locate and safely position a crane

Purpose
This unit provides the knowledge required to locate and safely position a crane

Prerequisite
ASPCP 7.1 K Demonstrate knowledge of accurate site assessments

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Demonstrate knowledge to establish the location of a crane on a work site

Performance Standards

1.1 Site access and conditions are explained

Must include

1. accessibility of site
2. grade of site
3. soil conditions and compaction
4. distance to embankments
5. initial location of load
6. place for load to be moved to
7. proximity of other equipment
8. overhead obstructions
9. distance to electrical power lines
10. known underground hazards
11. weather conditions

1.2 Load placement considerations and potential hazards are described

Must include

1. initial location of load
2. place for load to be moved to
3. proximity of other equipment
4. overhead obstructions
5. distance to electrical power lines
6. known underground hazards
7. weather conditions

Task 2

Demonstrate knowledge of blocking and blocking mats to be used according to soil conditions

Performance Standards

2.1 Blocking and blocking mat requirements are described according to soil types as specified by WorkSafeBC

Task 3

Demonstrate knowledge of communication required during crane and load positioning

Performance Standard

3.1 Requirements for communications during crane and load positioning are described

Must include

1. signallers
2. flag persons

Task 4

Demonstrate knowledge of barriers and signage required in a worksite

Performance Standard

4.1 Requirements for barriers and signage are described

Must include

1. clearance of the counterweight of crane and any fixed object
2. traffic control
3. pedestrian

Task 5

Demonstrate knowledge of procedures to properly ground and bond material at a worksite

Performance Standards

5.1 Procedures and requirements for grounding are described according to local authority requirements

5.2 Procedures and requirements for bonding are described according to local authority requirements

Unit Standard ASPCP 7.3 W

Site Planning & Crane Positioning
Conduct an accurate site assessment and safely position a crane in the workplace - mobile

Purpose
This unit provides demonstration of conducting a site assessment and locating and safely positioning a crane

Prerequisites
Unit Standard ASPCP 7.1 K Demonstrate knowledge of accurate site assessments
Unit Standard ASPCP 7.2 K Demonstrate knowledge to located and safely position a crane

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual,
Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1

Inspect a site and develop an accurate lift plan using blue prints and an engineered drawing

Performance

1.1 Lift plan is accurate

Must include

1. assessment of area and soil condition
2. assessment of hazards
3. assessment of obstacles
4. overhead hazards
5. underground utilities

1.2 Location and positioning of crane is safe and correct

Must include

1. blocking and blocking mats
2. signalling and barrier signage
3. grounding and bonding

Unit Standard ASPCP 7.6 K

Site Planning & Crane Positioning

Demonstrate knowledge to locate and safely position a boom truck with a folding boom (unlimited tonnage) using site assessment tools

Purpose

This unit provides the knowledge required to use lift plans and to assess a site accurately in order to set-up and operate a Boom Truck with folding boom crane (unlimited tonnage).

Prerequisite

Unit Standard CLC 5.2 K Demonstrate knowledge of loading and lifting

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS), and delivery agency policy

Task 1
Demonstrate knowledge of lift plans (left in until it can be verified if this is or is not relevant to Boom Trucks)

Performance standards

1.1 The purpose of site blue prints and engineering drawings in preparing lift plans is explained

Must include
1. structural integrity of the area
2. placement of load
3. placement of crane

1.2 The elements of a standard lift plan are described

Must include
1. routine to move load
2. signal person
3. radio/hand signals
4. signed by operator
5. signed by supervisor

Task 2
Demonstrate knowledge of how to assess a site to safely position a boom truck and perform the required lift(s).

Performance standards

2.1 Examining the site.

Must include
4. structural integrity of the area
5. placement of load
6. placement of Boom Truck and crane set up
7. proximity to slopes
8. proximity to excavations
9. ground stability and drainage

2.2 Planning the lift

Must include

6. routine to move load
7. signal person
8. radio/hand signals
9. signed by operator (where appropriate)
10. signed by supervisor (where appropriate)

Unit Standard ASPCP 7.7 W

Site Planning & Crane Positioning

Conduct an accurate site assessment and safely position a boom truck with a folding boom (unlimited tonnage) in the workplace

Purpose

This unit provides the knowledge required to locate and safely position a boom truck with folding boom.

Prerequisite

ASPCP 7.6 K Demonstrate knowledge to locate and safely position a boom truck with a folding boom (unlimited tonnage) using site assessment tools

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS), and delivery agency policy

Task 1

Inspect a site and develop an accurate lift plan

Performance Standards

1.1 Lift plan is accurate

Must include

1. assessment of area and soil condition
2. assessment of hazards
3. assessment of obstacles
4. overhead hazards
5. underground utilities
6. proximity to slopes
7. proximity to excavations
8. ground stability and drainage

1.2 Location and positioning of Boom Truck and crane boom is safe and correct

Must include

1. blocking and blocking mats
2. signalling and barrier signage
3. grounding and bonding

Unit Standard ASPCP 7.10 K

Site Planning & Crane Positioning

Demonstrate knowledge to locate and safely position a boom truck with a stiff boom 40 tonnes and under using site assessment tools

Purpose

This unit provides the knowledge required to assess a site accurately in order to set-up and operate a Boom Truck with a stiff boom 40 tonnes and under.

Prerequisite

Unit Standard CL 5.2 K Demonstrate knowledge of loading and lifting

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Demonstrate knowledge of how to assess a site to position a stiff boom truck and perform the required lift(s).

Performance standards

1.1 Examining the site.

Must include

1. structural integrity of the area
2. proximity to excavations
3. Drainage and site soil stability
4. placement of load
5. placement of boom truck
6. extension of boom sections
7. placement of jib

1.2 Planning the lift

Must include

1. routine to move load
2. signal person
3. radio/hand signals
4. signed by operator (where appropriate)
5. signed by supervisor (where appropriate)

Unit Standard ASPCP 7.11 W

Site Planning & Crane Positioning

Conduct an accurate site assessment and safely position a boom truck with a stiff boom (unlimited tonnage) in the workplace

Purpose

This unit provides a demonstration of conducting a site assessment and locating and safely positioning a crane

Prerequisites

Unit Standard ASPCP 7.10 K Demonstrate knowledge of accurate site assessments

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1

Inspect a site and develop an accurate lift plan

Performance Standards

1.1 Lift plan is accurate

Must include

1. assessment of area and soil condition
2. assessment of hazards
3. proximity to excavations and slopes
4. assessment of obstacles
5. overhead hazards
6. underground utilities

1.2 Location and positioning of Boom Truck is safe and correct

Must include

1. blocking and blocking mats
2. signalling and barrier signage
3. grounding and bonding

PROGRAM OUTLINE
FOR
SECTION 8

CRANE OPERATIONS

SECTION 8 – CRANE OPERATIONS
Unit Standard ACO 8.2 K

Crane Operations
Demonstrate knowledge of crane operations - mobile

Purpose

This unit provides the knowledge required to operate cranes to pick up and carry loads in a safe and efficient manner in accordance with the manufacturer's recommendations.

Prerequisites

All knowledge units in Sections 1 through 7 are required.

Unit Standard ACO 8.1 K Demonstrate knowledge of pre-operational requirements in crane operations

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations

The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997

CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,

ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or

ANSI/ASME B30.22-1993, Articulating Boom Crane,

Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge to correctly operate a crane without and with a load

Performance Standards

1.1 The safe and correct operation of a crane without a load is described

Must include
1. Booming up and booming down
2. telescoping in and out
3. slewing (swinging) clockwise and counter clockwise
4. hoisting up and down

1.2 The safe and correct operation of a crane with a load is described

Must include
1. Booming up and booming down
2. telescoping in and out
3. slewing (swinging) clockwise and counter clockwise
4. hoisting up and down

Task 2
Demonstrate knowledge of safe control according to conditions.

Performance Standard

2.1 Weather conditions and their affects on lifting are listed

Must include
1. ice
2. frozen to the ground
3. high winds
4. lightning storm

2.2 Techniques to maintain control of the hook block are described

Must include

1. maintain even control
2. use slower swing speeds

Task 3

Demonstrate knowledge of hoisting procedures for a mobile crane and a boom truck (Mobile)

Performance Standard

3.1 Pick and carry procedures are explained

Must include

1. travel slow speed
2. shortest boom length possible
3. load as low as possible

3.2 Procedures for operating in the vicinity of high voltage equipment are described according to local utilities and limits of approach

3.3 The procedures for doing a blind lift are explained.

Must include

1. use of radio when signaller not visible

Task 4

Demonstrate knowledge of the monitoring and troubleshooting required while operating a crane

4.1 Monitoring equipment performance during operation is described

Must include

1. water levels
2. oil fluid levels
3. hydraulic levels
4. instrument gauges

4.2 How to trouble shoot equipment problems is described according to manufacturer's specifications

Task 5

Demonstrate knowledge of safely and efficiently moving and placing a load at its intended destination

5.1 Moving and placing a load safely is described

Must include

1. obey signal person
2. avoid all obstacles
3. load is in the right destination

Task 6

Demonstrate knowledge of post operational procedure

Must include

1. check fluid levels
2. proper shut down of engine
3. proper lockup
4. leave in appropriate location

Unit Standard ACO 8.3 K

Crane Operations
Demonstrate knowledge to leave crane unattended – mobile

Purpose
This unit provides the knowledge required to leave a crane unattended for short or long periods of time in accordance with the manufacturer's recommendations.

Prerequisites
Unit Standard ACO 8.1 K Demonstrate knowledge of pre-operational requirements in crane operations
Unit Standard ACO 8.2 K Demonstrate knowledge of crane operations to pick up and carry loads

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Demonstrate knowledge to leave a crane unattended for short periods of time

Performance Standards

1.1 The procedure for leaving a crane unattended for short periods of time (lunch breaks etc.) is described

Must include

1. turn off and remove the key
2. brakes applied
3. dogs applied
4. leave in working position
5. attachment on the ground

1.2 The procedure for leaving a crane unattended for long periods of time (overnight, weekends etc) is described

Must include

1. boom down on blocking or in cradle
2. turn off and remove the key
3. brakes applied
4. dogs applied
5. attachment on the ground

Task 2

Demonstrate knowledge of the shut down procedures for a mobile crane

2.1 Cleaning wheels/tracks and attachments are described

2.2 The safe parking of equipment in the appropriate location is described

2.3 Correct shut down of equipment is described

2.4 Safely securing the equipment is described

Must include

1. lock up
2. disconnect battery / night switches

2.5 Housekeeping tasks described

Must include

1. keep deck clean
2. keep cab clean
3. remove rubbish/obstacles in cab

2.6 Post operation inspection is described

Must include

1. fluid levels
2. shut down
3. lock up
4. appropriate location

Unit Standard ACO 8.4 W

Crane Operations
Demonstrate safe crane set up according to manufacturer's instructions – core

(Note: Task 4 applies only to mobile cranes**)**

Purpose

This unit demonstrates a pre-operational inspection of a crane prior to use in accordance with manufacturer's recommendations

Prerequisites

All knowledge units in Sections 1 through 7.
Unit Standard ACO 8.1 K Demonstrate knowledge of pre-operational requirements in crane operations
Unit Standard ACO 8.2 K Demonstrate knowledge of crane operations to pick up and carry loads
Unit Standard ACO 8.3 K Demonstrate knowledge to leave a crane unattended

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Note: Tasks 1, 2 and 3 are part of the Core Crane Operators Program

Task 4 (mobile)

Perform setup procedures for a rubber tire and crawler mobile crane

Performance Standards

4.1 Setup procedures are accurately performed and area of operation is correctly scoped according to manufacturer's specifications and site plans

4.2 Overhead obstructions and underground hazards are recognised and avoided

Must include

1. power cables
2. trees
3. underground sewers
4. underground water
5. underground building structures

4.3 Blocking and mats are sufficient considering the load requirements and surface conditions to level the crane

4.4 Programming and adjusting safety devices to ensure accuracy and safety while lifting

Must include

1. LMI Load moment indicator
2. anti two block systems
3. boom angle indicators
4. level

Unit Standard ACO 8.5 W

Crane Operations
Use a mobile crane to safely pick up and carry loads in a workplace - mobile

Purpose
This unit demonstrates the use of mobile cranes to pick up and carry loads in a safe and efficient manner in accordance with the manufacturer's recommendations.

Prerequisites
Unit Standards in Sections 1 though 7
Unit Standard ACO 8.1 K Demonstrate knowledge of pre-operation requirements in crane operations Core)
Unit Standard ACO 8.2 K Demonstrate knowledge to crane operations
Unit Standard ACO 8.3 K Demonstrate knowledge to leave a crane unattended (Mobile)

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1

Correctly operate a crane with and without a load according to manufacturer's specifications.

Performance Standards

1.1 A crane without a load is safely and correctly operated

Must include

1. Booming up and booming down
2. slewing clockwise and counter clockwise
3. hoisting up and down
4. jibs
5. travel on site

1.2 A crane with a load is safely and correctly operated

Must include

1. Booming up and booming down is
2. slewing clockwise and counter clockwise
3. hoisting up and down
4. jibs
5. travel on site

Task 2

Adjust procedures according to conditions and maintain safe control of the hook block.

Performance Standard

2.1 Adjustments for weather conditions are performed (may be performed in a simulated environment)

Must include

1. ice
2. frozen to the ground
3. high winds
4. lightning storm

2.2 Techniques to maintain control of the hook block are demonstrated

Must include

1. maintain even control
2. use slower swing speeds

Task 3

Perform hoisting procedures for a mobile crane following manufacturer's recommendations and following all safety regulations.

Performance Standard

3.1 Pick and carry procedures are demonstrated

Must include

1. travel slow speed
2. shortest boom length possible
3. load as low as possible

3.2 Operating in the vicinity of high voltage equipment is safely demonstrated according to local utilities and limits of approach in a simulated environment

3.3 A blind lift is safely performed

Must include

1. use of radio when signaller not visible

Task 4

Monitor equipment performance and trouble shoot problems while using a crane.

4.1 Monitoring equipment performance is demonstrated

Must include

1. water levels
2. oil fluid levels
3. hydraulic levels
4. instrument gauges

4.2 Trouble shooting equipment problems is demonstrated according to manufacturer's specifications

Task 5
Safely and efficiently move and place loads at their intended destination

5.1 Load is moved and placed safely

Must include
1. obey signal person
2. avoid all obstacles
3. load is in the right destination

5.2 A load is moved as part of a multi-crane lift

Task 6
Perform post operational procedures

Performance Standards
6.1 Wheels/tracks and attachments are cleaned

6.2 Equipment is in the appropriate location and safely parked

6.3 Equipment is correctly shut down

6.4 Equipment is safely secured

Must include

1. lock up
2. disconnect battery

6.5 Housekeeping tasks are performed

Must include

1. deck is clean
2. cab is clean
3. rubbish/obstacles in cab is removed

6.6 Post operation inspection is performed

Must include

1. fluid levels
2. shut down
3. lock up
4. appropriate location

Unit Standard ACO 8.6 W

Crane Operations
Leave crane unattended – mobile

Purpose
This unit demonstrates the requirements to leave a crane unattended for short or long periods of time in accordance with the manufacturer's recommendations.

Prerequisites
Unit Standard ACO 8.3 K Demonstrate knowledge to leave crane unattended
Unit Standard ACO 8.2 K Demonstrate knowledge of crane operations to pick up and carry loads

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and delivery agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1
Leave a crane unattended for short and long periods of time

Performance Standards

1.1 A crane is safely and correctly left unattended for short periods of time (lunch breaks etc)

Must include

1. turn off and remove key
2. swing brake applied
3. swing dogs applied
4. leave in working position
5. attachment on the ground

1.2 A crane is safely and correctly left unattended for long periods of time (overnight, weekends etc)

Must include

1. boom down on blocking or in cradle
2. turn off and remove the key
3. swing brake applied
4. swing dogs applied
5. attachment on the ground

Task 2

Perform the shut down procedures for a mobile crane

2.1 Thoroughly clean wheels/tracks and attachment according to company requirements

2.2 Safely park crane equipment in the appropriate location

2.3 Shut down the equipment safely and correctly

2.4 Safely securing the equipment

Must include

1. lock up
2. disconnect battery / night switch

2.5 Housekeeping tasks are performed according to the company's standard requirements

Must include

1. keep deck clean
2. keep cab clean
3. remove rubbish/obstacles in cab

2.6 Perform a post operation inspection

Must include

1. fluid levels
2. shut down
3. lock up
4. appropriate location

Unit Standard ACO 8.9 K

Crane Operations

Demonstrate knowledge of crane operations for a boom truck with a folding boom (unlimited tonnage)

Purpose
This unit provides the knowledge required to operate a boom truck with a folding boom (unlimited tonnage) to lift and place loads in a safe and efficient manner in accordance with the manufacturer's recommendations.

Prerequisites
All Knowledge Units in Core and Advanced Sections 1 through 7 are required.

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997 CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1

Demonstrate knowledge of the use of the appropriate load charts for articulating boom cranes.

Performance standards

1.1 Load charts are interpreted accurately

1.2 Load dimensions are verified by crane supervisor, crane operator (and engineer as required)

1.3 Centre of gravity is calculated

1.4 Special lift instructions are noted

1.5 Safe working loads (SWL / WLL) for wire rope and rigging are determined

1.6 Appropriate hardware and safety devices are selected

1.7 Load on the slings is considered for equal and unequal lengths (when used)

Task 2

Demonstrate knowledge to correctly operate a folding boom crane without and with a load

Performance Standards

2.1 The safe and correct operation of a folding boom crane without a load is described

Must include

1. Booming up and booming down
2. telescoping in and out (when equipped with telescoping boom section)
3. slewing (swinging) clockwise and counter clockwise
4. hoisting up and down (when equipped with hoist)

2.2 The safe and correct operation of a folding boom crane with a load is described

Must include

1. Booming up and booming down
2. telescoping in and out (when equipped with telescoping boom section)
3. slewing (swinging) clockwise and counter clockwise
4. hoisting up and down (when equipped with hoist)

Task 3

Demonstrate knowledge of safe control of the load according to conditions.

Performance Standard

3.1 Weather conditions and their affects on lifting are listed

Must include

1. ice
2. frozen to the ground
3. high winds
4. lightning storm

3.2 Techniques to maintain control of the hook (and block when equipped with a hoist) are described

Must include

1. maintain even control
2. use slower swing speeds
3. awareness of the effect of slewing speed on load and boom swing radius

Task 4

Demonstrate knowledge of hoisting procedures for a boom truck with a folding boom 22 tonnes and under.

Performance Standard

4.1 Procedures for operating in the vicinity of high voltage equipment are described according to local utilities and limits of approach

4.2 The procedures for doing a blind lift are explained.

Must include

1. use of radio when signaller not visible

Task 5

Demonstrate knowledge of the monitoring and troubleshooting required while operating a folding boom crane

5.1 Monitoring equipment performance during operation is described

Must include

1. water levels
2. oil fluid levels
3. hydraulic levels
4. instrument gauges

5.2 How to trouble shoot equipment problems is described according to manufacturer's specifications

Task 6

Demonstrate knowledge of safely and efficiently moving and placing a load at its intended destination

6.1 Moving and placing a load safely is described

Must include

1. obey signal person
2. avoid all obstacles
3. load is in the right destination

Task 7

Demonstrate knowledge of post operational procedure

Must include

1. check fluid levels
2. proper shut down of engine
3. proper lockup
4. leave in appropriate location

Unit Standard ACO 8.10 W

Crane Operations

Operate a boom truck with a folding boom (unlimited tonnage) to safely lift and place loads in a workplace

Purpose
This unit demonstrates the operation of boom truck with a folding boom (unlimited tonnage) to lift and place loads in a safe and efficient manner in accordance with the manufacturer's recommendations.

Prerequisites
Unit Standards in Sections 1 though 7
Unit Standard CCO 8.1 K Demonstrate knowledge of pre-operational requirements in crane operations
Unit Standard ACO 8.9 K Demonstrate knowledge of pre-operational requirements in crane operations for a boom truck with a folding boom (unlimited tonnage).

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS), and delivery agency policy

Task 1

Correctly operate the boom crane with and without a load according to manufacturer's specifications.

Performance Standards

1.1 A crane without a load is safely and correctly operated

Must include

1. Booming up and booming down
2. Slewing clockwise and counter clockwise
3. Hoisting up and down when equipped with hoist
4. Travel to site prior to set up

1.2 A crane with a load is safely and correctly operated

Must include

1. Booming up and booming down
2. Slewing clockwise and counter clockwise
3. Hoisting up and down when equipped with hoist (and hook block when equipped with a winch).

Task 2

Adjust procedures according to conditions and maintain safe control of the hook. (and hook block when equipped with a winch).

Performance Standard

2.1 Adjustments for weather conditions are performed (may be performed in a simulated environment)

Must include

1. ice
2. frozen to the ground
3. high winds
4. lightning storm

2.2 Techniques to maintain control of the hook are demonstrated
Must include

1. maintain even control
2. use slower swing speeds

Task 3
Perform equipped lift using a boom truck with a folding boom following manufacturer's recommendations and following all safety regulations.

Performance Standard
3.1 Operating in the vicinity of high voltage equipment is safely demonstrated according to local utilities and limits of approach in a simulated environment

3.2 A blind lift is safely performed

Must include
1. use of radio when signaller not visible

Task 4
Monitor equipment performance and trouble shoot problems while using a crane.

4.1 Monitoring equipment performance is demonstrated

Must include
1. water levels
2. oil fluid levels
3. hydraulic levels
4. instrument gauges

4.2 Trouble shooting equipment problems is demonstrated according to manufacturer's specifications

Task 5
Safely and efficiently lift and place loads at their intended destination

5.1 Load is lifted and placed safely

Must include
1. obey signal person
2. avoid all obstacles
3. load is in the right destination

Task 6
Perform post operational procedures

Performance Standards
6.1 Wheels and attachments are cleaned

6.2 Equipment is in the appropriate location and safely parked

6.3 Equipment is correctly shut down

6.4 Equipment is safely secured

Must include
1. lock up
2. battery disconnect (switch)

6.5 Housekeeping tasks are performed

Must include
1. deck is clean
2. cab is clean
3. rubbish/obstacles in cab are removed

6.6 Post operation inspection is performed

Must include

1. fluid levels
2. shut down
3. lock up
4. appropriate location

Unit Standard ACO 8.13 K

Crane Operations

Demonstrate knowledge of crane operations for a boom truck with a stiff boom (unlimited tonnage)

Purpose

This unit provides the knowledge required to operate a boom truck with a stiff boom (unlimited tonnage) to lift up and place loads in a safe and efficient manner in accordance with the manufacturer's recommendations.

Prerequisites

All Core Knowledge Units in Sections 1 through 7 are required.

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge of the use of the appropriate load charts.

Performance standards

1.1 Load charts are interpreted accurately

1.2 Load dimensions are verified by crane supervisor, crane operator (and engineer as required)

1.3 Centre of gravity is calculated

1.4 Special lift instructions are noted

1.5 Safe working loads (SWL / WLL) for wire rope and rigging are determined

1.6 Appropriate hardware and safety devices are selected

1.7 Load on the slings is considered for equal and unequal lengths (when used)

Task 2
Demonstrate knowledge to correctly operate a boom truck with stiff boom without and with a load.

Performance Standards

1.1 The safe and correct operation of a boom truck with a stiff boom without a load is described

Must include

1. Booming up and booming down
2. telescoping in and out (when equipped with telescoping boom section)
3. slewing (swinging) clockwise and counter clockwise
4. hoisting up and down (when equipped with hoist)

1.2 The safe and correct operation of a boom truck with a stiff boom with a load is described

Must include

1. Booming up and booming down
2. telescoping in and out
3. slewing (swinging) clockwise and counter clockwise
4. hoisting up and down

Task 3

Demonstrate knowledge of safe control according to conditions.

Performance Standard

2.1 Weather conditions and their affects on lifting are listed

Must include

1. ice
2. frozen to the ground
3. high winds
4. lightning storm

2.2 Techniques to maintain control of the hook block are described

Must include

1. maintain even control
2. use slower swing speeds

Task 4

Demonstrate knowledge of hoisting procedures for a boom truck.

Performance Standard

3.1 Pick up and transport procedures are explained

Must include

1. travel slow speed
2. shortest boom length possible

3.2 Procedures for operating in the vicinity of high voltage equipment are described according to local utilities and limits of approach

3.3 The procedures for doing a blind lift are explained.

Must include

1. use of radio when signaller not visible

Task 5

Demonstrate knowledge of the monitoring and troubleshooting required while operating a boom truck with a stiff boom.

4.1 Monitoring equipment performance during operation is described

Must include

1. water levels
2. oil fluid levels
3. hydraulic levels
4. instrument gauges

4.2 How to trouble shoot equipment problems is described according to manufacturer's specifications

Task 6

Demonstrate knowledge of safely and efficiently lifting and placing a load at its intended destination

5.1 Lifting and placing a load safely is described

Must include

1. obey signal person
2. avoid all obstacles
3. load is in the right destination

Task 7

Demonstrate knowledge of post operational procedure

Must include

1. check fluid levels
2. proper shut down of engine
3. proper lockup
4. leave in appropriate location

Unit Standard ACO 8.14 W

Crane Operations

Use a boom truck with a stiff boom (unlimited tonnage) to safely pick up and carry loads in a workplace

Purpose

This unit demonstrates the use of boom truck with a stiff boom (unlimited tonnage) to lift up and place loads in a safe and efficient manner in accordance with the manufacturer's recommendations.

Prerequisites

Unit Standards in Sections 1 though 7
Unit Standard ATD 6.15 W Assemble/setup and disassemble a boom truck with a stiff boom (unlimited tonnage) at a worksite
Unit Standard ACO 8.11 K Demonstrate knowledge of pre-operational requirements in crane operations

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System (WHMIS) and delivery agency policy

Task 1

Demonstrate completing lifting plans and rigging for stiff boom trucks 40 tonnes and under.

Performance Standards

1.1 Lifting plans are completed.

1.2 Rigging is completed for load requirements/type.

Task 2

Correctly operate a boom truck with stiff boom with and without a load.

Performance Standards

2.1 A boom truck with stiff boom without a load is safely and correctly operated

Must include

1. Booming up and booming down
2. slewing clockwise and counter clockwise
3. hoisting up and down when equipped with hoist
4. travel on site prior to set up

2.2 A boom truck with stiff boom with a load is safely and correctly operated

Must include

1. Booming up and booming down
2. slewing clockwise and counter clockwise
3. hoisting up and down when equipped with hoist

Task 3

Adjust procedures according to conditions and maintain safe control of the hook.

Performance Standard

3.1 Adjustments for weather conditions are performed (may be performed in a simulated environment)

Must include

1. ice
2. frozen to the ground
3. high winds
4. lightning storm

3.2 Techniques to maintain control of the hook are demonstrated

Must include

1. maintain even control
2. use slower swing speeds

Task 4

Perform hoisting procedures with a boom truck stiff boom crane following manufacturer's recommendations and following all safety regulations.

Performance Standard

4.1 Operating in the vicinity of high voltage equipment are safely demonstrated according to local utilities and limits of approach in a simulated environment

4.2 A blind lift is safely performed

Must include

1. use of radio when signaller not visible

Task 5

Monitor equipment performance and trouble shoot problems while using a boom truck.

5.1 Monitoring equipment performance is demonstrated

Must include

1. water levels
2. oil fluid levels
3. hydraulic levels
4. instrument gauges

5.2 Trouble shooting equipment problems is demonstrated according to manufacturer's specifications

Task 6

Safely and efficiently lift and place loads at their intended destination

6.1 Load is lifted and placed safely

Must include

1. obey signal person
2. avoid all obstacles
3. load is in the right destination

Task 7

Perform post operational procedures

Performance Standards

7.1 Wheels and attachments are cleaned

7.2 Equipment is in the appropriate location and safely parked

7.3 Equipment is correctly shut down

7.4 Equipment is safely secured

Must include

1. lock up
2. battery disconnect switch

7.5 Housekeeping tasks are performed

Must include

1. deck is clean
2. cab is clean
3. rubbish/obstacles in cab are removed

7.6 Post operation inspection is performed

Must include

1. fluid levels
2. shut down
3. Lock up
4. appropriate location

PROGRAM OUTLINE
FOR
SECTION 9

MAINTENANCE & SERVICE

SECTION 9 – MAINTENANCE & SERVICE
Unit Standard AMS 9.2 K

Maintenance & Service
Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on mobile cranes 80 tonnes and under

Purpose

This unit provides the knowledge required to inspect engines, monitoring devices and hydraulic systems.

Prerequisites

Unit Standards in Core Sections 1, 2, 3, 4 and 9

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Note: The completion of Core Unit CMS 9.1 W is achieved naturally while completing the Advanced Units in Section 9 on Maintenance and Service.

Task 1
Demonstrate knowledge of tools required to perform basic maintenance.

Performance Standards

1.1 The tools required for basic crane maintenance and their functions are described.

Must include

1. grease gun
2. wrenches
3. screwdrivers
4. hammers
5. vice grips
6. shovels (track)
7. pinch bar
8. step ladder
9. tape measure (fibreglass or cloth)

Task 2
Demonstrate knowledge of inspecting engines on mobile cranes

Performance Standards

2.1 Engine inspections are correctly described

Must include

1. crank case oil
2. air filters and cleaner
3. radiator levels and coolant systems
4. air dryer systems

Task 3
Demonstrate knowledge of inspecting monitoring devices on mobile cranes

Performance Standard

3.1 Inspecting monitoring devices is accurately described

Must include

1. Load moment indicator (LMI)
2. boom angle indicator
3. boom length indicator
4. anti two block device

Task 4

Demonstrate knowledge of inspecting hydraulic systems on mobile cranes

Performance Standard

4.1 Safety precautions to take while performing inspections are described

Must include

1. discharge of pressure in system
2. avoiding oil being injected into the bloodstream
3. shut down of motor
4. avoiding burns and scalds

4.2 Inspecting hydraulic systems is accurately described

Must include

1. pumps
2. fluid levels
3. hoses
4. motors
5. valves

Unit Standard AMS 9.3 K

Maintenance & Service
Demonstrate knowledge of servicing and maintenance procedures on mobile cranes - mobile

Purpose
This unit provides the knowledge required to perform service and maintenance on mobile cranes

Prerequisites
Unit Standards AMS 9.2 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems.

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge of engine cooling system maintenance information from manufacturer's manuals.

Performance Standards

1.1 Use and interpretation of manufacturer's manuals is described

Task 2
Demonstrate knowledge of service and maintenance performed on mobile cranes

Performance Standards
2.1 Basic service and maintenance of crane engines is described

Must include
1. grease fittings
2. addition of required fluids
3. adjustment of belts
4. replacement of belts
5. adjustment of air cleaners
6. oil and filter change
7. hoses

2.2 Adjustment of control mechanisms is explained

Must include
1. slack adjusters
2. rollers
3. cables
4. brakes
5. clutches
6. levers

2.3 Structural maintenance is described

Must include

1. bolts
2. wedges
3. cotter keys
4. pins
5. guard rails
6. tracks
7. idlers

2.4 Cleaning crane components is described

Must include

1. batteries
2. cab
3. windows
4. wheels
5. tracks
6. deck
7. car body

2.5 Service and maintenance to crane and accessory systems is described

Must include

1. gearbox
2. hydraulic tank breathers
3. outriggers and stabilizers
4. booms
5. steering systems
6. air tanks
7. filters

2.6 Maintenance of cooling systems is described

Must include

1. air cooling systems
2. water cooling systems

Task 3
Demonstrate knowledge of factors influencing operator's maintenance responsibilities

Performance Standards

3.1 Factors influencing operator's maintenance responsibilities are explained

Must include
1. operator's responsibility according to industry
2. operator's capabilities
3. tool availability
4. availability of higher level maintenance
5. location

Task 4
Demonstrate knowledge of reporting and recording procedures for mobile crane service and maintenance.

Performance Standards

4.1 Reporting defects and deficiencies to the crane and site supervisors is explained

4.2 Recording maintenance in the log book is explained

Must include
1. maintenance requested
2. maintenance performed
3. legal requirements for entries

Unit Standard AMS 9.4 W

Maintenance & Service
Complete maintenance checklists (engine on/engine off) and maintain engines to manufacturer's specifications - mobile

Purpose
This unit provides the demonstration of engine maintenance according to manufacturer's specifications.

Prerequisites
Unit Standard AMS 9.2 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems
Unit Standard AMS 9.3 K Demonstrate knowledge of servicing and maintenance procedures on mobile cranes

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Complete maintenance engine checklists while the engine is OFF

Performance Standards

1.1 All parts of the checklist are accurately checked according to the company's requirements and manufacturer's manuals

1.2 Problems are accurately identified

1.3 Identified problems are recorded in the maintenance log book

1.4 Identified problems are reported to the crane superintendent

Task 2
Complete maintenance engine checklists while the engine is ON

Performance Standards

2.1 All parts of the checklist are accurately checked according to the company's requirements

2.2 Problems are accurately identified

2.3 Identified problems are recorded in the maintenance log book

2.4 Identified problems are reported to the crane superintendent

Task 3
Maintain engines to the manufacturer's specifications

Performance Standards

3.1 Basic service and maintenance of crane engines is performed

Must include

1. addition of required fluids
2. adjustment of belts
3. replacement of belts
4. air cleaners
5. oil filters
6. hoses

3.2 Manufacturer's manuals are interpreted accurately to determine maintenance requirements

3.3 The tools required for basic crane maintenance are correctly used.

Must include

1. grease gun
2. wrenches
3. screwdrivers
4. hammers
5. vice grips
6. shovels (track)
7. pinch bar
8. step ladder
9. tape measure (cloth or fibreglass)

3.4 Structural maintenance is performed

Must include

1. bolts
2. wedges
3. cotter keys
4. pins
5. guard rails

3.5 Service and maintenance to crane and accessory systems is performed

Must include

1. gearbox
2. hydraulic tank breathers
3. outriggers and stabilizers
4. booms
5. steering systems
6. air tanks
7. filters

3.6 Cleaning crane components is performed

Must include

- batteries
- cab
- windows
- wheels
- track
- deck
- car body

Unit Standard AMS 9.5 W

Maintenance & Service
Perform routine inspections and maintenance on hydraulic systems - mobile

Purpose
This unit provides the demonstration of routine maintenance on hydraulic systems on mobile cranes

Prerequisites
Unit Standard AMS 9.2 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems
Unit Standard AMS 9.3 K Demonstrate knowledge of servicing and maintenance procedures on mobile cranes

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS
And delivery Agency policy

Task 1

Perform routine inspections and maintenance of hydraulic systems on mobile cranes

Performance Standard

1.1 Inspection of hydraulic systems is accurately performed

Must include

1. pumps
2. fluid levels
3. hoses
4. motors

1.2 Maintenance of hydraulic systems is safely and correctly performed

Unit Standard AMS 9.6 W

Maintenance & Service
Inspect monitoring devices and control mechanisms on mobile cranes - mobile

Purpose

This unit provides the demonstration of inspection of monitoring devices and control mechanisms on mobile cranes

Prerequisites

Unit Standard AMS 9.2 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems
Unit Standard AMS 9.3 K Demonstrate knowledge of servicing and maintenance procedures on mobile cranes

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Inspect monitoring devices on mobile cranes according to manufacturer's specifications and company requirements

Performance Standard

1.1 Inspection of monitoring devices is accurately performed

Must include
1. Load moment indicator (LMI)
2. boom angle indicator
3. boom length indicator
4. anti two block device

1.2 Maintenance of monitoring systems is safely and correctly performed

Task 2
Inspect control mechanisms on mobile cranes according to manufacturer's specifications and company requirements

2.1 Control mechanisms are accurately inspected

2.2 Adjustment of control mechanisms is performed

Must include
1. slack adjusters
2. rollers
3. cables
4. brakes
5. clutches
6. levers

Unit Standard AMS 9.7 W

Maintenance & Service
Perform service on engine cooling systems on mobile cranes - mobile

Purpose
This unit provides the demonstration to perform service on engine cooling systems on mobile cranes

Prerequisites
Unit Standard AMS 9.2 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems
Unit Standard AMS 9.3 K Demonstrate knowledge of servicing and maintenance procedures on mobile cranes

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Perform service on engine cooling systems according to manufacturer's specifications.

Performance Standards

1.1 Manufacturer's manuals are interpreted correctly to perform service on engine cooling systems.

1.2 Service is correctly performed on engine air cooling systems

1.3 Service is correctly performed on water air cooling systems

Unit Standard AMS 9.13 K

Maintenance & Service

Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems for boom trucks with folding booms (unlimited tonnage)

Purpose

This unit provides the knowledge required to inspect engines, monitoring devices and hydraulic systems on boom trucks equipped with folding booms (unlimited tonnage).

Prerequisites

All Unit Standards in Core Sections 1, 2, 3, 4 and 9

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997 CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Note: The completion of Core Unit CMS 9.1 W is achieved naturally while completing the Advanced Units in Section 9 on Maintenance and Service.

Task 1

Demonstrate knowledge of tools required to perform basic maintenance.

Performance Standards

1.1 The tools required for basic crane maintenance and their functions are described.

Must include

1. grease gun
2. wrenches
3. screwdrivers
4. hammers
5. vice grips
6. shovels
7. pinch bar
8. step ladder
9. tape measure (fibreglass or cloth)

Task 2

Demonstrate knowledge of inspecting engines on boom trucks.

Performance Standards

2.1 Engine inspections are correctly described

Must include

1. crank case oil
2. air filters and cleaner
3. radiator levels and coolant systems
4. air dryer systems

Task 3
Demonstrate knowledge of inspecting monitoring devices on boom trucks.

Performance Standard

3.1 Inspecting monitoring devices is accurately described

Must include
1. Load moment indicator (LMI) (when equipped)
2. anti two block device (when hoist equipped)

Task 4
Demonstrate knowledge of inspecting hydraulic systems on boom trucks.

Performance Standard

4.1 Safety precautions to take while performing inspections are described

Must include
1. discharge of pressure in system
2. avoiding oil being injected into the bloodstream
3. shut down of motor
4. avoiding burns and scalds

4.2 Inspecting hydraulic systems is accurately described

Must include
1. pumps
2. fluid levels
3. hoses
4. motors
5. valves

Unit Standard AMS 9.14 K

Maintenance & Service

Demonstrate knowledge of servicing and maintenance procedures on procedures on boom trucks with folding booms (unlimited tonnage)

Purpose

This unit provides the knowledge required to perform service and maintenance on boom trucks with folding booms (unlimited tonnage).

Prerequisites

Unit Standard AMS 9.13 Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with folding booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997 CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge of engine cooling system maintenance information from manufacturer's manuals.

Performance Standards

1.1 Use and interpretation of manufacturer's manuals is described

Task 2
Demonstrate knowledge of service and maintenance performed on boom trucks with folding booms (unlimited tonnage)

Performance Standards
2.1 Basic service and maintenance of engines is described

Must include
1. grease fittings
2. addition of required fluids
3. adjustment of belts
4. replacement of belts
5. adjustment of air cleaners
6. oil and filter change
7. hoses

2.2 Adjustment of control mechanisms is explained

Must include
1. cables
2. brakes
3. levers

2.3 Structural maintenance is described

Must include

1. bolts
2. wedges
3. cotter keys
4. pins
5. guard rails

2.4 Cleaning boom truck components is described

Must include

1. batteries
2. windows
3. wheels
4. deck

2.5 Service and maintenance to boom truck and folding boom crane and accessory systems is described

Must include

1. gearbox
2. hydraulic tank breathers
3. outriggers and stabilizers
4. booms
5. steering systems
6. air tanks
7. filters

2.6 Maintenance of cooling systems is described

Must include

1. air cooling systems
2. water cooling systems

Task 3
Demonstrate knowledge of factors influencing operator's maintenance responsibilities

Performance Standards

3.1 Factors influencing operator's maintenance responsibilities are explained

Must include

1. operator's responsibility according to industry
2. operator's capabilities
3. tool availability
4. availability of higher level maintenance
5. location

Task 4
Demonstrate knowledge of reporting and recording procedures for boom truck crane service and maintenance.

Performance Standards

4.1 Reporting defects and deficiencies to the crane and site supervisors is explained

4.2 Recording maintenance in the log book is explained

Must include

1. maintenance requested
2. maintenance performed
3. legal requirements for entries

Unit Standard AMS 9.15 W

Maintenance & Service

Complete maintenance checklists (engine on/engine off) and maintain engines on a boom truck with a folding boom (unlimited tonnage) to manufacturer's specifications

Purpose

This unit provides the demonstration of engine maintenance according to manufacturer's specifications.

Prerequisites

Unit Standard AMS 9.13 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with folding booms (unlimited tonnage)
Unit Standard AMS 9.14 K Demonstrate knowledge of servicing and maintenance procedures on boom trucks with folding booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997 CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1

Complete maintenance engine checklists while the engine is OFF

Performance Standards

1.1 All parts of the checklist are accurately checked according to the company's requirements and manufacturer's manuals

1.2 Problems are accurately identified

1.3 Identified problems are recorded in the maintenance log book

1.4 Identified problems are reported to the crane superintendent

Task 2

Complete maintenance engine checklists while the engine is ON

Performance Standards

2.1 All parts of the checklist are accurately checked according to the company's requirements

2.2 Problems are accurately identified

2.3 Identified problems are recorded in the maintenance log book

2.4 Identified problems are reported to the crane superintendent

Task 3

Maintain engines to the manufacturer's specifications

Performance Standards

3.1 Basic service and maintenance of boom truck engines is performed

Must include

1. addition of required fluids
2. adjustment of belts
3. replacement of belts
4. air cleaners
5. oil filters
6. hoses

3.2 Manufacturer's manuals are interpreted accurately to determine maintenance requirements

3.3 The tools required for basic boom truck maintenance are correctly used.

Must include

1. grease gun
2. wrenches
3. screwdrivers
4. hammers
5. vice grips
6. pinch bar
7. step ladder
8. tape measure (cloth or fibreglass)

3.4 Structural maintenance is performed

Must include

1. bolts
2. wedges
3. cotter keys
4. pins
5. guard rails

3.5 Service and maintenance to boom truck and accessory systems is performed

Must include

1. gearbox
2. hydraulic tank breathers
3. outriggers and stabilizers
4. booms
5. steering systems
6. air tanks
7. filters

3.6 Cleaning boom truck components is performed

Must include

1. batteries
2. windows
3. wheels
4. deck

Unit Standard AMS 9.16 W

Maintenance & Service

Perform routine inspections and maintenance on hydraulic systems on boom trucks with folding booms (unlimited tonnage)

Purpose

This unit provides the demonstration of routine maintenance on hydraulic systems on boom trucks with folding booms (unlimited tonnage)

Prerequisites

Unit Standard AMS 9.13 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with folding booms (unlimited tonnage)
Unit Standard AMS 9.14 K Demonstrate knowledge of servicing and maintenance procedures on boom trucks with folding booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997 CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS
And delivery Agency policy

Task 1

Perform routine inspections and maintenance of hydraulic systems on boom trucks with folding booms (unlimited tonnage)

Performance Standard

1.1 Inspection of hydraulic systems is accurately performed

Must include

1. pumps
2. fluid levels
3. hoses
4. motors

1.2 Maintenance of hydraulic systems is safely and correctly performed

Unit Standard AMS 9.17 W

Maintenance & Service

Inspect monitoring devices and control mechanisms on boom trucks with folding booms (unlimited tonnage)

Purpose

This unit provides the demonstration of inspection of monitoring devices and control mechanisms on boom trucks with folding booms (unlimited tonnage)

Prerequisites

Unit Standard AMS 9.13 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with folding booms (unlimited tonnage)
Unit Standard AMS 9.14 K Demonstrate knowledge of servicing and maintenance procedures on boom trucks with folding booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997 CSA Standard Z150-98(R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Inspect monitoring devices on boom trucks with folding booms (unlimited tonnage) according to manufacturer's specifications and company requirements

Performance Standard

1.1 Inspection of monitoring devices is accurately performed

Must include
1. Load moment indicator (LMI) (when equipped)
2. anti two block device (when equipped with hoist)

1.2 Maintenance of monitoring systems is safely and correctly performed

Task 2
Inspect control mechanisms on boom trucks with folding booms (unlimited tonnage) according to manufacturer's specifications and company requirements

2.1 Control mechanisms are accurately inspected

2.2 Adjustment of control mechanisms is performed

Must include
1. cables
2. brakes
3. levers

Unit Standard AMS 9.23 K

Maintenance & Service

Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems for boom trucks with stiff booms (unlimited tonnage)

Purpose
This unit provides the knowledge required to inspect engines, monitoring devices and hydraulic systems.

Prerequisites
All Unit Standards in Core Sections 1, 2, 3, 4 and 9

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Note: The completion of Core Unit CMS 9.1 W is achieved naturally while completing the Advanced Units in Section 9 on Maintenance and Service.

Task 1

Demonstrate knowledge of tools required to perform basic boom truck with stiff boom maintenance.

Performance Standards

1.1 The tools required for basic boom truck maintenance and their functions are described.

Must include

1. grease gun
2. wrenches
3. screwdrivers
4. hammers
5. vice grips
6. shovels
7. pinch bar
8. step ladder
9. tape measure (fibreglass or cloth)

Task 2

Demonstrate knowledge of inspecting engines on boom trucks.

Performance Standards

2.1 Engine inspections are correctly described

Must include

1. crank case oil
2. air filters and cleaner
3. radiator levels and coolant systems
4. air dryer systems

Task 3
Demonstrate knowledge of inspecting monitoring devices on boom trucks.

Performance Standard

3.1 Inspecting monitoring devices is accurately described

Must include
1. Load moment indicator (LMI)
2. boom angle indicator
3. boom length indicator
4. anti two block device

Task 4
Demonstrate knowledge of inspecting hydraulic systems on boom trucks.

Performance Standard

4.1 Safety precautions to take while performing inspections are described

Must include
1. discharge of pressure in system
2. avoiding oil being injected into the bloodstream
3. shut down of motor
4. avoiding burns and scalds

4.2 Inspecting hydraulic systems is accurately described

Must include
1. pumps
2. fluid levels
3. hoses
4. motors
5. valves

Unit Standard AMS 9.24 K

Maintenance & Service

Demonstrate knowledge of servicing and maintenance procedures on procedures on boom trucks with stiff booms (unlimited tonnage)

Purpose

This unit provides the knowledge required to perform service and maintenance on boom trucks with stiff booms (unlimited tonnage).

Prerequisites

Unit Standard AMS 9.23 Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with stiff booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge of engine cooling system maintenance information from manufacturer's manuals.

Performance Standards

1.1 Use and interpretation of manufacturer's manuals is described

Task 2
Demonstrate knowledge of service and maintenance performed on boom trucks with stiff booms (unlimited tonnage)

Performance Standards
2.1 Basic service and maintenance of engines is described

Must include
1. grease fittings
2. addition of required fluids
3. adjustment of belts
4. replacement of belts
5. adjustment of air cleaners
6. oil and filter change
7. hoses

2.2 Adjustment of control mechanisms is explained

Must include
1. cables
2. brakes
3. clutches
4. levers

2.3 Structural maintenance is described

Must include

1. bolts
2. wedges
3. cotter keys
4. pins
5. guard rails

2.4 Cleaning crane components is described

Must include

1. batteries
2. cab
3. windows
4. wheels
5. deck

2.5 Service and maintenance to a boom truck and its accessory systems is described

Must include

1. gearbox
2. hydraulic tank breathers
3. outriggers and stabilizers
4. booms
5. steering systems
6. air tanks
7. filters

2.6 Maintenance of cooling systems is described

Must include

1. air cooling systems
2. water cooling systems

Task 3
Demonstrate knowledge of factors influencing operator's maintenance responsibilities

Performance Standards

3.1 Factors influencing operator's maintenance responsibilities are explained

Must include
1. operator's responsibility according to industry
2. operator's capabilities
3. tool availability
4. availability of higher level maintenance
5. location

Task 4
Demonstrate knowledge of reporting and recording procedures for mobile crane service and maintenance.

Performance Standards

4.1 Reporting defects and deficiencies to the boom truck and site supervisors is explained

4.2 Recording maintenance in the log book is explained

Must include
1. maintenance requested
2. maintenance performed
3. legal requirements for entries

Unit Standard AMS 9.25 W

Maintenance & Service

Complete maintenance checklists (engine on/engine off) and maintain engines on a boom truck with a stiff boom (unlimited tonnage) to manufacturer's specifications

Purpose

This unit provides the demonstration of engine maintenance according to manufacturer's specifications.

Prerequisites

Unit Standard AMS 9.23 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with stiff booms (unlimited tonnage)
Unit Standard AMS 9.24 K Demonstrate knowledge of servicing and maintenance procedures on boom trucks with stiff booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Complete maintenance engine checklists while the engine is OFF

Performance Standards

1.1 All parts of the checklist are accurately checked according to the company's requirements and manufacturer's manuals

1.2 Problems are accurately identified

1.3 Identified problems are recorded in the maintenance log book

1.4 Identified problems are reported to the crane superintendent

Task 2
Complete maintenance engine checklists while the engine is ON

Performance Standards

2.1 All parts of the checklist are accurately checked according to the company's requirements

2.2 Problems are accurately identified

2.3 Identified problems are recorded in the maintenance log book

2.4 Identified problems are reported to the crane superintendent

Task 3
Maintain engines to the manufacturer's specifications

Performance Standards

3.1 Basic service and maintenance of crane engines is performed

Must include

1. addition of required fluids
2. adjustment of belts
3. replacement of belts
4. air cleaners
5. oil filters
6. hoses

3.2 Manufacturer's manuals are interpreted accurately to determine maintenance requirements

3.3 The tools required for basic crane maintenance are correctly used.

Must include

1. grease gun
2. wrenches
3. screwdrivers
4. hammers
5. vice grips
6. pinch bar
7. step ladder
8. tape measure (cloth or fibreglass)

3.4 Structural maintenance is performed

Must include

1. bolts
2. wedges
3. cotter keys
4. pins
5. guard rails

3.5 Service and maintenance to crane and accessory systems is performed

Must include

1. gearbox
2. hydraulic tank breathers
3. outriggers and stabilizers
4. booms
5. steering systems
6. air tanks
7. filters

3.6 Cleaning crane components is performed

Must include

1. batteries
2. cab
3. windows
4. wheels
5. deck

Unit Standard AMS 9.26 W

Maintenance & Service

Perform routine inspections and maintenance on hydraulic systems on boom trucks with stiff booms (unlimited tonnage)

Purpose

This unit provides the demonstration of routine maintenance on hydraulic systems on boom trucks with stiff booms (unlimited tonnage)

Prerequisites

Unit Standard AMS 9.23 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with stiff booms (unlimited tonnage)
Unit Standard AMS 9.24 K Demonstrate knowledge of servicing and maintenance procedures on boom trucks with stiff booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS
And delivery Agency policy

Task 1

Perform routine inspections and maintenance of hydraulic systems on boom trucks with stiff booms (unlimited tonnage)

Performance Standard

1.1 Inspection of hydraulic systems is accurately performed

Must include

1. pumps
2. fluid levels
3. hoses
4. motors

1.2 Maintenance of hydraulic systems is safely and correctly performed

Unit Standard AMS 9.27 W

Maintenance & Service

Inspect monitoring devices and control mechanisms on boom trucks with stiff booms (unlimited tonnage)

Purpose

This unit provides the demonstration of inspection of monitoring devices and control mechanisms on boom trucks with stiff booms (unlimited tonnage)

Prerequisites

Unit Standard AMS 9.23 K Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with stiff booms (unlimited tonnage)
Unit Standard AMS 9.24 K Demonstrate knowledge of servicing and maintenance procedures on boom trucks with stiff booms (unlimited tonnage)

Assessment

For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations, and industry practices:
CAN/CSA-Z150-98 (R2004) Safety Code on Mobile Cranes,
Z150.3 Knuckle-boom Cranes – (New Standard under development)
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System (WHMIS)

Quality Assurance

Any assessor assessing against this competency standard must be an occupationally competent Boom Truck mounted crane operator with industrial experience; and have completed the assessor registration competency.

References

WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B 30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Inspect monitoring devices on boom trucks with stiff booms (unlimited tonnage) according to manufacturer's specifications and company requirements

Performance Standard

1.1 Inspection of monitoring devices is accurately performed

Must include

1. Load moment indicator (LMI)
2. boom angle indicator
3. boom length indicator
4. anti two block device

1.2 Maintenance of monitoring systems is safely and correctly performed

Task 2
Inspect control mechanisms on boom trucks with stiff booms (unlimited tonnage) according to manufacturer's specifications and company requirements

2.1 Control mechanisms are accurately inspected

2.2 Adjustment of control mechanisms is performed

Must include

1. cables
2. brakes
3. clutches
4. levers

PROGRAM OUTLINE
FOR
SECTION 10

HYDRAULIC BOOM CRANES
UNLIMITED TONNAGE

SECTION 10 – HYDRAULIC BOOM CRANES
Unit Standard AHBC 10.1 K

Hydraulic Boom Crane (unlimited tonnage)
Demonstrate knowledge of hydraulic boom crane structure and assembly

Purpose
This unit provides the knowledge of hydraulic boom crane structure, attachments and assembly

Prerequisites
Completed Crane Core Qualification and Mobile Crane 80 tonnes and under qualification

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge of hydraulic boom cranes, their components and attachments.

Performance standards

1.1 The features and components of hydraulic boom cranes are explained

1.2 Use of specialised hydraulic boom crane attachments are described according to manufacturer's specifications.

1.3 The uses of hydraulic boom cranes are described

1. engineered lift
2. heavy lift
3. multiple crane lift
4. work platforms
5. working on water

Unit Standard AHBC 10.2 K

Hydraulic Boom Crane (unlimited tonnage)
Demonstrate knowledge of hydraulic boom crane load charts and load calculations

Purpose
This unit provides the knowledge of hydraulic boom crane load charts and load calculations

Prerequisites
Completed Crane Core Qualification and Mobile Crane 80 tonnes and under qualification

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge of load charts and calculations for hydraulic boom crane

Performance standards

1.1 Load weights are accurately explained

1.2 Load calculations are accurately explained

Task 2

Demonstrate knowledge of crane documentation affecting loads

2.1 Engineer's drawings/blue prints are interpreted accurately

Must include

1. capacity
2. boom configuration
3. load weight
4. rigging weights
5. calculations
6. radius of crane
7. positioning of crane
8. positioning of load

2.2 Shipping company's bill of lading and an estimated weight based on volume, Load Moment Indicator (LMI) and type of load are compared to confirm accuracy

Unit Standard AHBC 10.3 K

Hydraulic Boom Crane (unlimited tonnage)
Demonstrate knowledge of lift plans and rigging for hydraulic boom cranes

Purpose
This unit provides the knowledge of lift plans for hydraulic boom cranes

Prerequisites
Completed Crane Core Qualification and Mobile Crane 80 tonnes and under qualification

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge to determine sufficient lifting capacity of a crane considering the configuration and attachments required for the lift

Performance Standards

1.1 Optimum boom configurations are described

Must include
1. boom length
2. boom angle
3. radius
4. hook height
5. quadrant

1.2 Configurations appropriate for lifting loads are described

Must include
1. radius
2. parts of line
3. height of the combined load and rigging
4. weight of the combined load and rigging
5. boom length
6. boom jib combination
7. counterweight combination

1.3 Verification of configurations for the lifts for the crane are described

Must include
1. site supervisor
2. crane supervisor
3. engineer
4. completion of lift forms as required by the company

1.4 Differences between gross load and gross capacity are described

1.5 Static and dynamic loading and lifting principles are described.

Task 2
Demonstrate knowledge of selection of rigging hardware to safely lift loads in accordance with manufacturer's recommendations

Performance Standards

2.1 Load configurations are accurately determined.

Must include
1. calculations for rigging
2. calculations of loads

2.2 Load height, weight, length and width are verified

2.3 Centre of gravity for a load is accurately calculated

2.4 The safe working load (SWL/ WLL) for wire rope and rigging hardware is accurately calculated and used.

Must include
1. prevent overloading
2. prevent spooling

2.5 Criteria for selecting the appropriate hardware are described according to manufacturer's requirements.

Must include
1. weight
2. size of load

2.6 Criteria for selecting the appropriate safety devices are described.

Must include
1. shape
2. weight
3. sharp edges of load
4. round edges of load

2.7 Loads on slings of equal and unequal length are accurately calculated.

Must include
1. weight of load
2. centre of gravity
3. sling angles
4. dimension of the load (height, weight, length)

Unit Standard AHBC 10.4 W

Hydraulic Boom Crane (unlimited tonnage)
Operate a hydraulic boom crane safely according to manufacturer's specifications and regulations

Purpose
This unit provides the demonstration of hydraulic boom crane operation

Prerequisites
Unit Standard AHBC 10.1 K Demonstrate knowledge of hydraulic boom crane structure and assembly
Unit Standard AHBC 10.2 K Demonstrate knowledge of hydraulic boom crane load charts and load calculations
Unit Standard AHBC10.3 K Demonstrate knowledge of lift plans for hydraulic boom cranes

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1

Configure hydraulic boom crane appropriately after accurately interpreting load charts and load study drawings.

Performance standards

1.1 Load charts are interpreted accurately

1.2 Load dimensions are verified by crane supervisor and crane operator

May include

1. engineer

1.3 Centre of gravity is calculated

1.4 Special lift instructions are followed

1.5 Safe working loads (SWL / WLL) for wire rope and rigging are determined

1.6 Appropriate hardware and safety devices are selected

1.7 Load on the slings is considered for equal and unequal lengths

Task 2

Perform pre-operational inspection procedures recommended for a hydraulic boom crane according to company requirements and manufacturer's manual

Performance Standards

2.1 Inspection procedures are performed accurately.

2.2 The place, location and verification of operator aids is checked

2.3 Inspection and erection reports are completed and filed correctly

Task 3

Perform tests, repairs and maintenance required during the pre-operation inspection stage.

Performance Standards

3.1 Function tests on hoist systems are performed

3.2 Repairs and maintenance prior to operation are performed

Task 4

Complete reports and records required for reporting deficiencies or defects.

Performance Standard

4.1 Defects and deficiencies are accurately reported to the supervisor and properly documented in the crane log book

4.2 The process to ensure repairs and maintenance are recorded in the appropriate crane log book

Task 5

Perform the setup procedures for a hydraulic boom

Performance Standards

5.1 Setup procedures are accurately performed according to manufacturer's specifications

5.2 Overhead obstructions and underground hazards are observed and managed.

5.3 Sufficient blocking/ mats/ are provided considering the load requirements and surface conditions to level the crane

5.4 Safety devices are programmed and adjusted to ensure accuracy and safety while lifting

Task 6

Demonstrate knowledge to correctly operate a hydraulic boom crane without a load

Performance Standards

6.1 The safe and correct operation of a crane without a load is performed

6.2 The safe and correct operation of a crane with a load is performed

Task 7

Perform procedures for the safe control of the hook block according to conditions.

Performance Standard

7.1 Weather conditions and their affects on lifting are considered and managed

7.2 Techniques to maintain control of the hook block are performed

Task 8

Perform hoisting procedures for a hydraulic boom crane

Performance Standard

8.1 Safe hoisting procedures are performed

8.2 Procedures for operating in the vicinity of high voltage equipment are performed through simulation

8.3 The procedures for doing a blind lift are performed

Task 9

Perform monitoring and troubleshooting procedures while operating a hydraulic boom crane

Performance Standards

9.1 Monitoring equipment performance during operation is demonstrated

9.2 Trouble shooting equipment problems is performed

Task 10
Safely and efficiently move and place a load at its intended destination

Performance Standards

10.1 Moving and placing a load safely is achieved.

Task 11
Perform post operational procedures for a hydraulic boom crane.

Performance Standard

11.1 Post operation procedures for a hydraulic boom crane are correctly and safely performed.

PROGRAM OUTLINE FOR SECTION 11

HYDRAULIC LATTICE BOOM CRANES

SECTION 11 – LATTICE BOOM CRANES

Unit Standard ALBC 11.1 K

Lattice Boom Crane
Demonstrate knowledge of lattice boom crane structure and assembly

Purpose
This unit provides the knowledge of lattice boom crane structure, attachments and assembly

Prerequisites
Completed Crane Common Core Program and Mobile Crane 80 tonnes and under qualification.

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge of lattice boom cranes, their components and attachments.

Performance standards

1.1 The features and components of lattice boom cranes are explained

1.2 Specialised lattice boom crane attachments are described

Must include

1. clam bucket
2. dragline bucket
3. pile hammer and leads
4. drill

1.3 The uses of lattice boom cranes are described

Must include

1. work platform (engineered)
2. engineered lift
3. heavy lift
4. dragline operations
5. multi crane lifts
6. lifting from a barge or float
7. lifting load from under water

Unit Standard ALBC 11.2 K

Lattice Boom Crane
Demonstrate knowledge of lattice boom crane load charts and load calculations

Purpose
This unit provides the knowledge of lattice boom crane load charts and load calculations

Prerequisites
Completed Crane Common Core Program and Mobile Crane 80 tonnes and under Qualification

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge of load charts and calculations for lattice boom cranes.

Performance standards

1.1 Load weights are accurately explained

1.2 Load calculations are accurately explained

Task 2
Demonstrate knowledge of crane documentation affecting loads

2.1 Engineer's drawings/blue prints are interpreted accurately

Must include

1. capacity
2. boom configuration
3. load weight
4. rigging weight
5. calculations
6. radius of crane
7. positioning of crane
8. positioning of load
9. Marine charts
10. Bucket placement devices

2.2 Shipping company's bill of lading and an estimated weight based on volume, Load Moment Indicator (LMI) and type of load are compared to confirm accuracy

Unit Standard ALBC 11.3 K

Lattice Boom Crane
Demonstrate knowledge of lift plans and rigging for lattice boom cranes

Purpose
This unit provides the knowledge of lift plans for lattice boom cranes

Prerequisites
Completed Crane Common Core Program and Mobile Crane 80 tonnes and under Qualification

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge to determine sufficient lifting capacity of a crane considering the configuration and attachments required for the lift.

Performance Standards

1.1 Optimum boom configurations are described

Must include
1. boom length
2. boom angle
3. radius
4. hook height
5. quadrant

1.2 Configurations appropriate for lifting loads are described

Must include
1. radius
2. parts of line
3. height of the combined load and rigging
4. weight of the combined load and rigging
5. boom length
6. boom jib combination
7. counterweight combination

1.3 Verification of configurations for the lifts for the crane are described

Must include
1. site supervisor
2. crane supervisor
3. engineer
4. crane operator
5. completion of lift forms as required by the company

1.4 Differences between gross load and gross capacity are described

1.5 Static and dynamic loading and lifting principles are described

Task 2
Demonstrate knowledge of selection of rigging hardware to safely lift loads in accordance with manufacturer's recommendations

Performance Standards

2.1 Load configurations are accurately determined

Must include
1. calculations for rigging
2. calculations for loads

2.2 Load height, weight, length and width are verified

2.3 Centre of gravity for a load is accurately calculated

2.4 The safe working load (SWL / WLL) for wire rope and rigging hardware is accurately calculated and used

Must include
1. prevent overloading
2. prevent over-spooling

2.5 Criteria for selecting the appropriate hardware are described according to manufacturer's requirements.

Must include
1. weight
2. size of load

2.6 Criteria for selecting the appropriate safety devices are described.

Must include
1. shape
2. weight
3. sharp edges of load
4. round edges of load

2.7 Loads on slings of equal and unequal length are accurately calculated

Must include
1. weight of load
2. centre of gravity
3. sling angles
4. dimension of the load (height, weight, length)

Unit Standard ALBC 11.4 W

Lattice Boom Crane
Operate a lattice boom crane safely according to manufacturer's specifications and regulations

Purpose
This unit provides the demonstration of lattice boom crane operation

Prerequisites
Unit Standard ALBC 11.1 K Demonstrate knowledge of lattice boom crane structure and assembly
Unit Standard ALBC 11.2 K Demonstrate knowledge of lattice boom crane load charts and load calculations
Unit Standard ALBC 11.3 K Demonstrate knowledge of lift plans for lattice boom cranes

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1

Configure lattice boom crane appropriately after accurately interpreting load charts and load study drawings.

Performance standards

1.1 Load charts are interpreted accurately

1.2 Load dimensions are verified by crane supervisor and crane operator

May include

1. engineer

1.3 Centre of gravity is calculated

1.4 Special lift instructions are followed

1.5 Safe working loads (SWL / WLL) for wire rope and rigging are determined

1.6 Appropriate hardware and safety devices are selected

1.7 Load on the slings is considered for equal and unequal lengths

Task 2

Perform pre-operational inspection procedures recommended for a lattice boom crane according to manufacturer and company requirements

Performance Standards

2.1 Inspection procedures are performed accurately

2.2 The place, location and verification of operator aids for the crane are checked

2.3 Inspection and erection reports are completed and correctly filed

Task 3

Perform tests, repairs and maintenance required during the pre-operation inspection stage.

Performance Standards

3.1 Function tests on hoist systems are performed

3.2 Repairs and maintenance prior to operation are performed

Task 4

Complete reports and records required for reporting deficiencies or defects.

Performance Standard

4.1 Defects and deficiencies are accurately reported to the supervisor and properly documented in the crane log book

4.2 The process to ensure repairs and maintenance are recorded in the appropriate crane log book

Task 5

Perform the setup procedures for a lattice boom

Performance Standards

5.1 Setup procedures are accurately performed according to manufacturer's specifications

5.2 Overhead obstructions and underground hazards are observed and managed.

5.3 Sufficient blocking and mats are provided considering the load requirements and surface conditions to level the crane

5.4 Safety devices are programmed and adjusted to ensure accuracy and safety while lifting

Task 6

Demonstrate knowledge to correctly operate a lattice boom crane with and without a load

Performance Standards

6.1 The safe and correct operation of a crane without a load is performed

6.2 The safe and correct operation of a crane with a load is performed

Task 7
Perform procedures for the safe control of the hook block according to conditions.

Performance Standard

7.1 Weather conditions and their effects on lifting are considered and managed

7.2 Techniques to maintain control of the hook block are performed

Task 8
Perform hoisting procedures for a lattice boom crane

Performance Standard

8.1 Pick and carry procedures are performed

8.2 Hoisting procedures are performed

8.3 Procedures for operating in the vicinity of high voltage equipment are performed through simulation

8.4 The procedures for doing a blind lift are performed

Task 9
Perform monitoring and troubleshooting procedures while operating a lattice boom crane

Performance Standards
9.1 Monitoring equipment performance during operation is demonstrated

9.2 Trouble shooting equipment problems is performed

Task 10

Safely and efficiently move and place a load at its intended destination.

Performance Standard

10.1 Moving and placing a load safely are achieved.

Task 11

Perform post operational procedures for a lattice boom crane

Performance Standard

11.1 Post operational procedures for a lattice boom crane are safely and correctly performed

PROGRAM OUTLINE
FOR
SECTION 12

LATTICE FRICTION CRANES

SECTION 12 – LATTICE FRICTION CRANES
Unit Standard ALFC 12.1 K

Lattice Friction Crane
Demonstrate knowledge of lattice friction crane structure and assembly

Purpose
This unit provides the knowledge of lattice friction crane structure, attachments and assembly

Prerequisites
Completed Crane Common Core Program and Mobile Crane 80 tonnes and under Qualification.

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge of lattice friction cranes, their components and attachments.

Performance standards

1.1 The features and components of lattice friction cranes are explained

Must include

1. friction brakes
2. friction clutches
3. boom assembly
4. boom disassembly
5. disassembly and assembly of crane upper and lower

1.2 Specialised lattice friction crane attachments are described

1.3 The uses of lattice friction cranes are described

Must include

1. work platform (engineered)
2. engineered lift
3. heavy lift
4. dragline operations
5. clamming
6. multi crane lifts
7. lifting load from under water
8. Lifting from barges and floats

Unit Standard ALFC 12.2 K

Lattice Friction Crane
Demonstrate knowledge of lattice friction crane load charts and load calculations

Purpose
This unit provides the knowledge of lattice friction crane load charts, and their use in load calculations.

Prerequisites
Crane Common Core Program and Mobile Crane 80 tonnes and under Qualification

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge of load charts and calculations for lattice friction crane

Performance standards

1.1 Load weights are accurately explained

1.2 Load calculations are accurately explained

Task 2

Demonstrate knowledge of crane documentation affecting loads

2.1 Engineer's drawings/blue prints are interpreted accurately

Must include

1. capacity
2. boom configuration
3. load rate
4. rigging rate
5. calculations
6. radius of crane
7. positioning of crane
8. positioning of load

2.2 Shipping company's bill of lading and an estimated weight based on volume, Load Moment Indicator (LMI) and type of load are compared to confirm accuracy

Unit Standard ALFC 12.3 K

Lattice Friction Crane
Demonstrate knowledge of lift plans and rigging for lattice friction cranes

Purpose
This unit provides the knowledge of lift plans for lattice friction cranes

Prerequisites
Crane Common Core Program and Mobile Crane 80 tonnes and under Qualification

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Demonstrate knowledge to determine sufficient lifting capacity of a crane considering the configuration and attachments required for the lift

Performance Standards

1.1 Optimum boom configurations are described

Must include
1. boom length
2. boom angle
3. radius
4. hook height
5. quadrant

1.2 Configurations appropriate for lifting loads are described

Must include
1. radius
2. parts of line
3. height of the combined load and rigging
4. weight of the combined load and rigging
5. boom length
6. boom jib combination
7. counterweight combination

1.3 Verification of configurations for the lifts for the crane are described

Must include
1. site supervisor
2. crane supervisor
3. completion of lift forms as required by the company

1.4 Differences between gross load and gross capacity are described

1.5 Static and dynamic loading and lifting principles are described

Task 2

Demonstrate knowledge of selection of rigging hardware to safely lift loads in accordance with manufacturer's recommendations.

Performance Standards

2.1 Load configurations are accurately determined

Must include
1. calculations for rigging
2. calculations for loads

2.2 Load height, weight, length and width are verified

2.3 Centre of gravity for a load is accurately calculated

2.4 The safe working load (SWL / WLL) for wire rope and rigging hardware is accurately calculated and used

Must include
31. prevent overloading
32. prevent spooling

2.5 Criteria for selecting the appropriate hardware are described according to manufacturer's requirements.

Must include
1. weight
2. size of load

2.6 Criteria for selecting the appropriate safety devices are described.

Must include
1. shape
2. weight
3. sharp edges of load
4. round edges of load

2.7 Loads on slings of equal and unequal length are accurately calculated

Must include
1. weight of load
2. centre of gravity
3. sling angles
4. dimension of the load (height, weight, length)

Unit Standard ALFC 12.4 W

Lattice Friction Crane
Operate a lattice friction crane safely according to manufacturer's specifications and regulations

Purpose
This unit provides the demonstration of lattice friction crane operation

Prerequisites
Unit Standard ALFC 12.1 K Demonstrate knowledge of lattice friction crane structure and assembly
Unit Standard ALFC 12.2 K Demonstrate knowledge of lattice friction crane load charts and load calculations
Unit Standard ALFC 12.3 K Demonstrate knowledge of lift plans for lattice friction cranes

Assessment
For assessment purposes, all explanations, descriptions, and activities must comply with current legislation, including WorkSafeBC regulations and industry practice. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes, ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/ASME B30.22-1993, Articulating Boom Crane, Workplace Hazardous Material Information System (WHMIS) and Delivery Agency policy.

Quality Assurance
Any assessor assessing against this competency standard must be an occupationally competent crane operator with Red Seal endorsement (in the case of Mobile Crane) and industrial experience; and have completed the assessor registration competency.

References
WorkSafeBC Occupational Health and Safety (OHS) regulations
The Hoisting and Rigging Safety Manual, Construction Safety Association of Ontario, 1997
CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,
ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or
ANSI/ASME B30.22-1993, Articulating Boom Crane,
Workplace Hazardous Material Information System WHMIS and delivery Agency policy

Task 1
Configure lattice friction crane appropriately after accurately interpreting load charts and load study drawings.

Performance standards

1.1 Load charts are interpreted accurately

1.2 Load dimensions are verified by crane supervisor and crane operator (may also include an engineer)

1.3 Centre of gravity is calculated

1.4 Special lift instructions are followed

1.5 Safe working loads (SWL/ WLL) for wire rope and rigging are determined

1.6 Appropriate hardware and safety devices are selected

1.7 Load on the slings is considered for equal and unequal lengths

Task 2
Perform pre-operational inspection procedures recommended for a lattice friction crane according to company requirements

Performance Standards

2.1 Inspection procedures are performed accurately

2.2 The place, location and verification of operator aids for the crane are checked

2.3 Inspection and erection reports are completed and filed correctly

Task 3
Perform tests, repairs and maintenance required during the pre-operation inspection stage.

Performance Standards

3.1 Function tests on hoist systems are performed

3.2 Repairs and maintenance prior to operation are performed

Task 4
Complete reports and records required for reporting deficiencies or defects.

Performance Standard

4.1 Defects and deficiencies are accurately reported to the supervisor and properly documented in the crane log book

4.2 The process to ensure repairs and maintenance are recorded in the appropriate crane log book

Task 5
Perform the setup procedures for a lattice friction crane

Performance Standards

5.1 Setup procedures are accurately performed according to manufacturer's specifications

5.2 Overhead obstructions and underground hazards are observed and managed.

5.3 Sufficient blocking and mats are provided considering the load requirements and surface conditions to level the crane

5.4 Safety devices are programmed and adjusted to ensure accuracy and safety while lifting

Task 6
Demonstrate knowledge to correctly operate a lattice friction crane with and without a load

Performance Standards

6.1 The safe and correct operation of a crane without a load is performed

6.2 The safe and correct operation of a crane with a load is performed

Task 7
Perform procedures for the safe control of the hook block according to conditions.

Performance Standard

7.1 Weather conditions and their affects on lifting are considered and managed

7.2 Techniques to maintain control of the hook block are performed

Task 8
Perform hoisting procedures for a lattice friction crane

Performance Standard

8.1 Hoisting procedures are performed

8.2 Pick and carry procedures are performed

8.3 Procedures for operating in the vicinity of high voltage equipment are performed through simulation

8.4 The procedures for doing a blind lift are performed

Task 9
Perform monitoring and troubleshooting procedures while operating a lattice friction crane

Performance Standards

9.1 Monitoring equipment performance during operation is demonstrated

9.2 Trouble shooting equipment problems is performed

Task 10
Safely and efficiently move and place a load at its intended destination

Performance Standard

10.1 Moving and placing a load safely

Task 11
Perform post operational procedures for a lattice friction crane

Performance Criteria
11.1 Post operational procedures for a lattice friction crane are performed

MOBILE CRANE OPERATOR LATTICE BOOM FRICTION CRANE

TRAINING PROVIDER STANDARDS

TRAINING PROVIDER STANDARDS

The Lattice Friction Crane Program is a Competency Based Program of Instruction. This means that the Program Outline defines the Outcomes expected of training, not the inputs, which include time.

By their nature cranes require a one-to-one ratio of student-to-crane to develop the required competence. Industry believes a crane operator becomes competent through building on his or her theoretical knowledge with real world experience.

This program is divided into theoretical and practical components.

The theoretical component is made up of the Knowledge Units, which:

- can be taught in a classroom setting by a qualified instructor (see below)
- delivered on line
- learned through self study on line or through printed materials

The practical component is made up of the Workplace Units, which:

- require hands on experience
- are assessed on the job by a Registered Workplace Assessor
- may be begun in a simulated setting such as a training yard, but are assessed for credit in the workplace

The industry is interested in the outcome of training and is looking for creative responses from the crane training community on how to best deliver training to these standards in a time efficient and cost effective manner. Industry has purposely not set minimum equipment requirements for this reason.

Past training experience in this area has shown consistent training outcomes to these standards in a wide range of times and with a variable mix of on seat equipment time vs. theory instruction time.

With these competence standards industry now has a vehicle for structuring on the job training and wishes to see trainers take advantage of the opportunity on the job training represents. For example, some ideas industry has discussed as options include:

4. Support learners on the job by bringing the trainer to the job site. Crane purchase or rental is not required by the trainer and the learner receives targeted instruction.

5. Deliver instruction in the evenings or on weekends to complement the learner's on the job experience.
6. Deliver targeted theory and practical instruction precisely geared to the standards in this outline – which will ideally guarantee a highly skilled individual to the employer who can demonstrate workplace competence in short order.

Instructor Qualification:

For technical training, instructors must be occupationally competent to run the crane type they are training to, and hold a full scope certificate for the crane type they are training to.

Minimum List of Shop/Laboratory Equipment Required for Lattice Friction Crane

Industry wishes to state no minimum requirement in the interest of permitting training providers maximum flexibility in the options and strategies they may employ in training to these standards.

RECOMMENDED REFERENCE TEXTBOOKS

From the Construction Safety Association of Ontario http://www.csao.org/

Mobile Crane Manual
by Donald E. Dickie, P. Eng., D. H. Campbell, P. Eng.
Construction Safety Association of Ontario ..... SBN 0-8273-6527-6

Rigging Manual
by Donald E. Dickie, P. Eng.
Construction Safety Association of Ontario ..... SBN 0-7726-1574-8

Hoisting and Rigging Safety Manual
Construction Safety Association of Ontario ..... SBN 0-919465-70-6

Slings
Construction Safety Association of Ontario ..... SBN 0-919465-76-5

Safety in Rigging Video/DVD Series

The complete set of 10 *Safety in Rigging* DVDs (FD001-FD010), complete with instructor's notes. Includes:

11. Cranes: Types, Components and Case Histories (FD001)
12. Hazard Awareness in Crane Operating Areas (FD002)
13. International Hand Signals (FD003)
14. Wire Rope (FD004)
15. Hardware (FD005)
16. Chain (FD006)
17. Slings (FD007)
18. Reeving (FD008)
19. Hoists, Winches and Related Devices (FD009)
20. Jacks, Rollers and Related Devices (FD010)

Cranes: Types, Components and Case Histories Video/DVD (set of 10)

From the Operating Engineers Training Institute of Ontario http://www.oetio.com

Mobile Craning Today
Operating Engineers Training Institute of Ontario..... SBN 0-8273-5460-6

Additional Resources

IPT's Crane and Rigging Handbook
by Ronald G. Garby .....ISBN 0-920855-14-8

IPT's Crane and Rigging Training Manual
By Ronald G. Garby .....ISBN 0-920855-16-4

Reference Authority

6. WorkSafeBC Occupational Health and Safety (OHS) regulations

7. WorkSafe BC Occupational First Aid Requirements

8. CAN/CSA-Z150-98 (R2004) Safety Code for Mobile Cranes,

9. ANSI Standard ANSI/ASME B30.5-1994, Mobile and Locomotive Crane or ANSI/AMSE B30.22-1993, Articulating Boom Crane,

10. ANSI Standard ANSI/SIA A92.2-2001 American National Standard Vehicle-Mounted Elevating and Rotating Aerial Devices

BC Crane Safety

Crane Certification and Licensing Authority

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