



**COMPETENCY STANDARD**

**FOR**

**HEAVY EQUIPMENT OPERATION**  
(CRANE & FORKLIFT))

(CONSTRUCTION SECTOR)

**Skills for Industry Competitiveness and Innovation Program (SICIP)**  
**Finance Division, Ministry of Finance**



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The Competency Standards for Heavy Equipment Operation (Crane and Forklift) serves as a foundational document for creating curricula, teaching and learning materials, and assessment tools. It also facilitates training aligned with industry requirements, ensuring that individuals who meet the set standards through assessment are qualified and ready for relevant job roles.

This document has been crafted for use in training programs under the **Skills for Industry Competitiveness and Innovation Program (SICIP)** to address the skills demands of the construction sector. Ownership of this document is held by the Finance Division of the Ministry of Finance, People's Republic of Bangladesh.

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## INTRODUCTION:

The Skills for Industry Competitiveness and Innovation Program (SICIP) has the overall objective of developing a skilled workforce adept at handling new technologies, especially for emerging industries in Bangladesh. It will expand skills training and strengthen the development of the training ecosystem to address the skills requirements of the SICIP-selected industry sectors. The program aims to (i) increase the technology-oriented skilled workforce across emerging and priority sectors, (ii) promote inclusive skilling and upskilling opportunities for women and socially disadvantaged groups, (iii) incentivize industry-university partnerships to nurture innovation capacity and improve industry competitiveness, and (iv) foster skills for climate-resilient manufacturing processes and green technologies. The program is expected to benefit about 220,000 new and existing workers over a 6-year implementation period from 2024-2029.

The SICIP Program has, therefore, taken the initiative to enhance the employability and productivity of trainees by implementing market-responsive and job-focused training programs through public and private training providers. This will require the development of competency standards for each of the occupations/trades which will provide a structured framework in the learning process to guide training providers, ensure consistent training quality, and create an alignment between the skills provided by the training institutes and the needs of the industry.

**The Competency Standard also suggests integration of YouTube or similar platforms or downloaded clips into classroom practice to ensure simulated creation of the contents so that learners are exposed to visual demonstrations before classroom instruction or practical session, which aligns with modern learning preference and supports flipped classroom models.**

This competency standard is therefore developed to improve skills following the job roles and skill sets of the occupation and ensure that the required skills are aligned with industry requirements.

The document details the format, sequencing, wording, and layout of the Competency Standard for an occupation which comprises Units of Competence and its corresponding Elements.

## OVERVIEW:

A **Competency Standard** is a written specification of the knowledge, skills, and attitudes required for the performance of a job or occupation or trade corresponding to the standard of performance required in the workplace.

Competency standard:

- provides a consistent and reliable set of components for training, recognizing, and assessing people's skills, and may also have optional support materials.
- enables industry-recognized qualifications to be awarded through direct assessment of workplace competencies
- encourages the development and delivery of flexible training that suits individual and industry requirements
- encourages learning and assessment in a work-related environment which leads to verifiable workplace outcomes.

Competency Standard has been reviewed and updated by a working group comprised of occupation-specific experts from the industry/institution and relevant consultants of SICIP.

Competency Standards describe the skills, knowledge, and attitude needed to perform effectively in the workplace. Competency Standards acknowledge that people can achieve vocational and technical competency in many ways by emphasizing what the learner can do, not how or where they learned to do it.

With Competency Standards, assessment and training may be conducted at the workplace, at training organization, during regular work, or through work experience, work placement, work simulation or any combination of these.

A Unit of Competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of Competency are documented in a standard format that comprises:

- Reference to Industry Sector, Occupational Title and Occupational Description
- Unit code
- Unit title
- Unit descriptor
- Unit of Competency
- Elements and performance criteria
- Variables and range statement
- Evidence guides

Together all the parts of a Unit of Competency:

- Describe a work activity
- Guide the assessor in determining whether the candidate is competent.

Identification and validation of units of competency and elements for each occupation were made by experts from Construction industry in consultative workshop.

The ensuing sections of this document comprise a description of the respective occupation with all the key components of a Unit of Competence:

- An overview of all Units of Competence for the occupation and their corresponding duration required for completion of training.
- The Competency Standards that include the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide, and Assessment Evidence Guide.

**Units & Elements at a Glance:**

**Generic Competencies (30 Hrs.)**

<b>SL</b>	<b>Code</b>	<b>Unit of competency</b>	<b>Elements of competency</b>	<b>Duration (hours)</b>
1.	SICIP-CON-CAF-01-G	Apply Occupational Health and Safety (OHS) Practices in the Workplace	<ol style="list-style-type: none"> <li>1. Identify OHS policies and procedures</li> <li>2. Apply personal health and safety practices</li> <li>3. Report hazards and risks</li> <li>4. Respond to emergencies</li> </ol>	10
2.	SICIP-CON-CAF-02-G	Work in a team environment	<ol style="list-style-type: none"> <li>1. Identify team goals and processes</li> <li>2. Communicate and cooperate with team members</li> <li>3. Work as a team member</li> <li>4. Solve problems as a team member</li> </ol>	20
			<b>Total hours</b>	<b>30 Hrs.</b>

### Occupation Specific Competencies (330 hrs.)

Code	Unit of Competency	Elements of Competency	Duration (hours)
SICIP-CON-CAF-01-O	Understand Crane and Forklift Fundamentals	<ol style="list-style-type: none"> <li>1. Identify different types of cranes and forklifts.</li> <li>2. Describe major components of crane and forklift.</li> <li>3. Explain functions and working systems.</li> <li>4. Identify common worksite hazards.</li> <li>5. Interpret safety signs and indicators.</li> <li>6. Identify basic hand tools and power tools.</li> </ol>	30
SICIP-CON-CAF-02-O	Conduct Crane Pre-Operation Inspection	<ol style="list-style-type: none"> <li>1. Inspect boom, hook, wire rope, and lifting devices.</li> <li>2. Check outriggers and support systems.</li> <li>3. Check operational controls, brakes, alarms, and signals.</li> <li>4. Review load charts.</li> <li>5. Check fuel, battery, coolant and engine oil levels.</li> </ol>	15
SICIP-CON-CAF-03-O	Operate Crane for Lifting Operations	<ol style="list-style-type: none"> <li>1. Position crane on site correctly.</li> <li>2. Prepare crane for lifting tasks.</li> <li>3. Lift, swing, and lower loads safely.</li> <li>4. Communicate using standard hand signals and radios.</li> <li>5. Maintain stability and safe load control.</li> <li>6. Shut down crane and secure it after operations.</li> </ol>	170
SICIP-CON-CAF-04-O	Perform Forklift Pre-Operation Checks	<ol style="list-style-type: none"> <li>1. Inspect forks, mast, chains, hydraulics, and tires.</li> <li>2. Check fuel, battery, coolant, and engine oil levels.</li> </ol>	10

Code	Unit of Competency	Elements of Competency	Duration (hours)
		<ol style="list-style-type: none"> <li>3. Test brakes, steering, lights, and warning devices.</li> <li>4. Verify load rating, fork spacing, and load condition.</li> <li>5. Identify unsafe workplace conditions.</li> </ol>	
SICIP-CON-CAF-05-O	Operate Forklift for Load Handling	<ol style="list-style-type: none"> <li>1. Start forklift smoothly and safely.</li> <li>2. Follow site rules and signals.</li> <li>3. Lift, carry, and reposition loads.</li> <li>4. Stack, arrange, and unstack materials.</li> <li>5. Control driving speed and turning movements.</li> <li>6. Park forklift in a designated safe area.</li> </ol>	75
SICIP-CON-CAF-06-O	Maintain Crane and Forklift Equipment	<ol style="list-style-type: none"> <li>1. Clean machines and remove debris after use.</li> <li>2. Lubricate moving and high-wear parts.</li> <li>3. Replace basic components.</li> <li>4. Monitor fuel and battery levels.</li> <li>5. Store tools, attachments, and accessories.</li> </ol>	30
<b>Total Hours</b>			<b>330 Hrs.</b>

## COMPETENCY STANDARD: HEAVY EQUIPMENT OPERATION (CRANE AND FORKLIFT)

### Generic Competencies

<b>Unit of Competency:</b>  <b>APPLY OCCUPATIONAL HEALTH AND SAFETY (OHS) PRACTICES IN THE WORKPLACE</b>	<b>Nominal Duration:</b> 10 hrs.	<b>Unit Code:</b> SICIP-CON-CAF-01-G
<b>Unit Descriptor:</b>  This unit covers the knowledge, skills and attitudes required to apply Occupational Health and Safety (OH&S) practices in the workplace. It specifically includes the tasks of identifying OHS policies and procedures; applying personal health and safety practices; reporting hazards and risks; and responding to emergencies.		

### Elements and Performance Criteria:

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Identify OHS policies and procedures	1.1 <b><u>OHS policies</u></b> and safe operating procedures are read and understood. 1.2 Safety signs and symbols are identified and followed. 1.3 Emergency response, evacuation procedures and other contingency measures are determined.
2. Apply personal health and safety practices	2.1 OHS policies and procedures are followed and practiced. 2.2 <b><u>Personal Protective Equipment (PPE)</u></b> is selected and used. 2.3 Personal hygiene is maintained.
3. Report hazards and risks	3.1 <b><u>Hazards and risks</u></b> are identified, assessed and controlled. 3.2 Incidents arising from hazards and risks are reported to authority. 3.3 Corrective actions are implemented to correct unsafe conditions in the workplace.
4. Respond to emergencies	4.1 Alarms and warning devices are responded. 4.2 <b><u>Emergency response plans and procedures</u></b> are implemented. 4.3 <b><u>First aid procedure</u></b> is applied during emergency situations.

### Range of Variables

Variable	Range
	May include but not limited to:
1. OHS policies	1.1 International OHS requirements 1.2 Bangladesh standards for OHS

	<ul style="list-style-type: none"> <li>1.3 Building Code</li> <li>1.4 Fire Safety Rules and Regulations</li> <li>1.5 Industry Guidelines</li> </ul>
2. Personal Protective Equipment (PPE)	<ul style="list-style-type: none"> <li>2.1 Apron</li> <li>2.2 Gas Mask</li> <li>2.3 Gloves</li> <li>2.4 Safety shoes</li> <li>2.5 Helmet</li> <li>2.6 Face mask</li> <li>2.7 Overalls</li> <li>2.8 Goggles and safety glasses</li> <li>2.9 Ear plugs</li> <li>2.10 Sun block</li> <li>2.11 Chemical/Gas masks</li> </ul>
3. Hazards and risks	<ul style="list-style-type: none"> <li>3.1 Chemical hazards.</li> <li>3.2 Biological hazards.</li> <li>3.3 Physical Hazards. <ul style="list-style-type: none"> <li>3.3.1 Machine hazards.</li> <li>3.3.2 Materials hazards.</li> <li>3.3.3 Tools and Equipment hazards.</li> </ul> </li> </ul>
4. Emergency response plans and procedures	<ul style="list-style-type: none"> <li>4.1 Firefighting procedures</li> <li>4.2 Earthquake response procedures</li> <li>4.3 Evacuation procedures</li> <li>4.4 Medical and first aid</li> </ul>
5. First aid procedure	<ul style="list-style-type: none"> <li>5.1 Washing of open wound</li> <li>5.2 Washing chemically infected area</li> <li>5.3 Applying bandage</li> <li>5.4 Tourniquet</li> <li>5.5 Applying CPR (Cardiopulmonary Resuscitation)</li> <li>5.6 Taking appropriate medicine</li> </ul>

**Curricular Evidence Guide:**

1. Underpinning Knowledge	<ul style="list-style-type: none"> <li>1.1 OHS workplace policies and procedures.</li> <li>1.2 Work safety procedures.</li> <li>1.3 Emergency procedures. <ul style="list-style-type: none"> <li>1.3.1 Firefighting.</li> <li>1.3.2 Earthquake response.</li> <li>1.3.3 Explosion response.</li> <li>1.3.4 Accident response.</li> </ul> </li> <li>1.4 Types of (biological, chemical and physical) and their effects.</li> <li>1.5 PPE types and uses.</li> <li>1.6 Personal hygiene practices.</li> <li>1.7 OHS awareness.</li> </ul>
2. Underpinning Skills	<ul style="list-style-type: none"> <li>2.1 Identifying OHS policies and procedures</li> <li>2.2 Following personal work safety practices</li> </ul>

	<ul style="list-style-type: none"> <li>2.3 Reporting hazards and risks</li> <li>2.4 Responding to emergency procedures</li> <li>2.5 Maintaining physical well-being in the workplace</li> <li>2.6 Performing first aid.</li> <li>2.7 Performing basic firefighting accessories using fire extinguishers</li> <li>2.8 Applying basic first aid procedures</li> </ul>
3. Underpinning Attitudes	<ul style="list-style-type: none"> <li>3.1 Commitment to occupational health and safety practices</li> <li>3.2 Communication with peers, sub-ordinates and seniors in workplace.</li> <li>3.3 Promptness in carrying out activities</li> <li>3.4 Tidiness and timeliness</li> <li>3.5 Respect of peers, sub-ordinates and seniors in workplace</li> <li>3.6 Environmental concern</li> <li>3.7 Sincere and honest to duties</li> </ul>
4. Resource Implications	<ul style="list-style-type: none"> <li>4.1 Workplace (simulated or actual)</li> <li>4.2 PPEs</li> <li>4.3 Firefighting equipment</li> <li>4.4 Emergency response manual</li> <li>4.5 First aid kits</li> </ul>

**Assessment Evidence Guide:**

1. Critical Aspects of Competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Followed OHS policies and procedures.</li> <li>1.2 Selected and used personal protective equipment (PPE).</li> <li>1.3 Reported incidents arising from hazards and risks to authority.</li> <li>1.4 Emergency response plans and procedures are implemented.</li> <li>1.5 Applied basic first aid procedure.</li> </ul>
2. Methods of Assessment	<p>Competency should be assessed by:</p> <ul style="list-style-type: none"> <li>2.1 Written test</li> <li>2.2 Practical Demonstration</li> <li>2.3 Oral Questioning</li> <li>2.4 Portfolio (Optional)</li> </ul>
3. Context of Assessment	<ul style="list-style-type: none"> <li>3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training.</li> <li>3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.</li> </ul>

<b>Unit of Competency:</b> <b>WORK IN A TEAM ENVIRONMENT</b>	<b>Nominal Duration:</b> 10 hrs.	<b>Unit Code:</b> SICIP-CON-CAF-02-G
<b>Unit Descriptor:</b>  This unit covers the skills, knowledge and attitudes required to work in a team environment. It specifically includes the tasks of identifying team goals and processes, communicating and cooperating with team members, working as a team member and solving problems as a team member.		

### Elements and Performance Criteria:

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

<b>Elements of Competency</b>	<b>Performance Criteria</b>
1. Identify team goals and processes	1.1 Team goals and collaborative decision-making processes are identified. 1.2 Roles and responsibilities of team members are identified. 1.3 Relationships within team and with other workers are identified.
2. Communicate and cooperate with team members	2.1 Effective interpersonal skills are used to interact with team members and to contribute to activities and objectives. 2.2 Formal and informal <b><u>forms of communication</u></b> are used effectively to support team achievement. 2.3 Diversity in character is respected and valued in team functioning. 2.4 Views and opinions of other team members are understood and valued. 2.5 Workplace terminology is used correctly to assist communication.
3. Work as a team member	3.1 Duties, responsibilities, authorities, objectives and task requirements are identified and clarified with team. 3.2 Tasks are performed in accordance with organizational and team requirements, specifications and workplace procedures. 3.3 Team member's support with other members are made to ensure team achieves goals, awareness and requirements. 3.4 Agreed reporting lines are followed using standard operating procedure.
4. Solve problems as a team member	4.1 Current and potential problems faced by team are identified. 4.2 A solution to the problem is identified. 4.3 Problems are solved effectively and the outcome of the implemented solution is evaluated.

**Range of variables:**

<b>Variables</b>	<b>Range</b> (may include but not limited to)
1. Forms of communication	1.1 Agenda 1.2 Simple reports such as progress and incident reports 1.3 Job sheets 1.4 Operational manuals 1.5 Brochures and promotional material 1.6 Visual and graphic materials 1.7 Standards 1.8 OSH information 1.9 Signs

**Curricular Content Guide**

1. Underpinning Knowledge	1.1 Team goals and collaborative decision-making processes 1.2 Roles and responsibilities of team members 1.3 Relationships within team and with other workers 1.4 Effective interpersonal skills to interact with team members 1.5 Effective formal and informal forms of communication 1.6 Value of diversity in team functioning. 1.7 Correct use of workplace terminology 1.8 Team's duties, responsibilities, authorities, objectives and task requirements 1.9 Support mechanism to other members of team to ensure achievements of goals. 1.10 Methods of identifying current and potential problems faced by a team 1.11 Effective problem-solving methods and evaluation of outcomes
2. Underpinning Skills	2.1 Identifying team goals and collaborative decision-making processes 2.2 Identifying roles and responsibilities of team members 2.3 Identifying relationships within team and with other workers 2.4 Using effective interpersonal skills to interact with team members and to contribute to activities and objectives 2.5 Using formal and informal forms of communication 2.6 Understanding and valuing views and opinions of other team members 2.7 Performing tasks in accordance with organizational and team requirements, specifications and workplace procedures. 2.8 Supporting other members of the team to ensure team achieves goals, awareness and requirements. 2.9 Identifying current and potential problems faced by the team 2.10 Identifying solutions to the problem 2.11 Solving problems effectively and evaluating the outcome of the implemented solution

3. Underpinning Attitudes	3.1 Commitment to occupational health and safety 3.2 Promptness in carrying out activities 3.3 Sincere and honest to duties 3.4 Environmental concerns 3.5 Eagerness to learn 3.6 Tidiness and timeliness 3.7 Respect for rights of peers and seniors in the workplace 3.8 Communication with peers, subordinates and seniors in the workplace
4. Resource implications	The following resources must be provided: 4.1 Workplace (simulated or actual) 4.2 Manuals/Guidelines 4.3 Pens 4.4 Papers 4.5 Work books

### Assessment Evidence Guide

1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 identified team goals and work processes 1.2 communicated and cooperated with team members. 1.3 worked as a team member 1.4 solved problems as a team member
2. Methods of assessment	Competency should be assessed by: 2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

## The Occupation Specific Competencies

<b>Unit of Competency:</b> <b>UNDERSTAND CRANE AND FORKLIFT FUNDAMENTALS</b>	<b>Nominal Duration:</b> 30 Hrs.	<b>Unit Code:</b> SICIP-CON-CAF-01-O
<b>Unit Descriptor:</b>  This unit covers the skills, knowledge and attitudes required to understand crane and forklift fundamentals. It specifically includes the tasks of identifying different types of cranes and forklift, describing major components of crane and forklift, explaining functions and working systems, identifying common worksite hazards, interpreting safety signs and indicators and identifying basic hand tools and power tools.		

### Elements and Performance Criteria:

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Identify different types of cranes and forklifts.	1.1 <b><u>Different types of cranes</u></b> used in construction are identified. 1.2 <b><u>Types of forklifts</u></b> suitable for various site tasks are recognized. 1.3 Key features of crane type are described. 1.4 Key features forklift type is described.
2. Describe major components of crane and forklift.	2.1 <b><u>Major components of cranes</u></b> are identified. 2.2 <b><u>Major components of forklifts</u></b> are identified. 2.3 Functions of major components are described.
3. Explain functions and working systems.	3.1 Functions of cranes are explained. 3.2 Functions of forklifts are explained. 3.3 <b><u>Basic working systems</u></b> are identified and described. 3.4 <b><u>Controlling functions</u></b> of each machine is interpreted.
4. Identify common worksite hazards.	4.1 <b><u>Common worksite hazards</u></b> related to crane and forklift operation are identified. 4.2 <b><u>Risks</u></b> are recognized. 4.3 Ground conditions, weather issues, and obstruction hazards are reviewed. 4.4 Electrical line and overhead structure hazards are identified. 4.5 Pedestrian movement and traffic hazards are assessed.
5. Interpret safety signs and indicators.	5.1 <b><u>Safety signs</u></b> related to crane and forklift operation are identified and interpreted. 5.2 <b><u>Warning indicators</u></b> on the machine dashboard are recognized and understood. 5.3 Load limit and hazard signs are interpreted for safe operation.
6. Identify basic hand tools and power	6.1 <b><u>Basic hand tools used in crane and forklift maintenance</u></b> are identified.

tools.	6.2 <b>Common power tools</b> required for servicing tasks are recognized. 6.3 Functions and uses of each tool are described.
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### Range of Variables

Variable	Range (Includes but not limited to):
1. Different types of cranes	1.1 Mobile crane 1.2 Crawler crane 1.3 Rough crane 1.4 Gantry crane 1.5 Overhead crane 1.6 Jib crane 1.7 Tower crane
2. Types of forklifts	2.1 Counterbalance forklift 2.2 Rough terrain forklift 2.3 Telescopic handler (telehandler) 2.4 Reach truck 2.5 Pallet jack 2.6 Side loader forklift
3. Major components of cranes	3.1 Chassis 3.2 Engine 3.3 Hydraulic system 3.4 Transmission system 3.5 Boom 3.6 Hook 3.7 Binder rope 3.8 Jib 3.9 Tires/track shoes 3.10 Controlling unit 3.11 Hoist 3.12 Slewing unit 3.13 Outriggers 3.14 Counterweight 3.15 Operator cabin
4. Major components of forklifts	4.1 Engine 4.2 Hydraulic system 4.3 Transmission system 4.4 Mast 4.5 Forks 4.6 Carriage 4.7 Cylinder 4.8 Counterweight 4.9 Tires 4.10 Operator seat and controls 4.11 Controlling lever

5. Basic working systems	5.1 Hydraulic system 5.2 Steering system 5.3 Braking system 5.4 Lifting system 5.5 Power transmission system 5.6 Electrical system
6. Controlling functions	6.1 Lifting 6.2 Loading 6.3 Lowering 6.4 Steering 6.5 Accelerator 6.6 Braking 6.7 Clutching
7. Common worksite hazards	7.1 Fire hazards 7.2 Electrical hazards 7.3 Mechanical hazards 7.4 Chemical hazards 7.5 Environmental hazards 7.6 Falling object hazards 7.7 Ground collapse hazards 7.8 Visibility hazards 7.9 Noise and vibration hazards
8. Risks	<b>Crane Major Risks</b> 8.1 Load falling 8.2 Crane overturning 8.3 Boom collapse 8.4 Mechanical failure 8.5 Hydraulic failure 8.6 Binder breakage 8.7 Electrical contact 8.8 Environmental 8.9 Outriggers 8.10 Uneven ground <b>Forklift Major Risks</b> 8.11 Tip-over 8.12 Load falling 8.13 Pedestrian collision 8.14 Mechanical failure
9. Safety signs	9.1 Warning sign 9.2 Danger sign 9.3 Caution sign 9.4 Mandatory sign 9.5 Prohibition sign 9.6 Emergency exit sign 9.7 Fire safety sign
10. Warning indicators	<b>Crane Warning Indicators</b>

	<p>10.1 Overload warning  10.2 Boom angle warning  10.3 Anti-two-block alarm  10.4 Hydraulic pressure warning  10.5 Engine temperature warning  10.6 Oil/fuel pressure warning  10.7 Brake warning  10.8 RPM</p> <p><b>Forklift Warning Indicators</b></p> <p>10.9 Overload warning  10.10 Battery/charging warning  10.11 Hydraulic system warning  10.12 Engine temperature warning  10.13 Oil/fuel pressure warning  10.14 Brake warning  10.15 Seatbelt/Operator presence warning  10.16 RPM</p>
11. Basic hand tools used in crane and forklift maintenance	<p>11.1 Spanner set  11.2 Socket or ratchet set  11.3 Screwdrivers (Flat and Star)  11.4 Pliers  11.5 Multimeter  11.6 Allen key set  11.7 Hammer  11.8 Wrenches  11.9 Filter opener  11.10 Measuring tape  11.11 Cleaning brush</p>
12. Common power tools	<p>12.1 Impact wrench  12.2 Electric drill  12.3 Hand grinder  12.4 Blower  12.5 Air compressor  12.6 Pressure washer  12.7 Portable lighting set  12.8 Battery-operated grease gun</p>

### Curricular Content Guide

1. Underpinning Knowledge	<p>1.1. Basic concept of different types of cranes and forklifts used in construction and material-handling work.  1.2. Key features, characteristics, and typical applications of various crane and forklift types.  1.3. Major components of cranes and forklifts and the basic functions of each component.  1.4. Fundamental working systems of both machines.  1.5. Basic understanding of load-handling functions and how machine controls support safe operation.</p>
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	<ul style="list-style-type: none"> <li>1.6. Common worksite hazards.</li> <li>1.7. Identification of essential hand tools and power tools used in crane and forklift servicing.</li> <li>1.8. Basic concept of tool functions and how they support maintenance and minor servicing tasks.</li> </ul>
2. Underpinning Skills	<ul style="list-style-type: none"> <li>2.1. Identifying types of cranes and forklifts and their key features.</li> <li>2.2. Recognizing major components and describing their functions.</li> <li>2.3. Explaining basic functions and working systems of each machine.</li> <li>2.4. Interpreting machine controls, indicators, and operating functions.</li> <li>2.5. Identifying common worksite hazards related to crane and forklift operation.</li> <li>2.6. Interpreting safety signs, warning indicators, and load limits.</li> <li>2.7. Identifying and selecting basic hand tools and power tools for maintenance.</li> </ul>
3. Underpinning Attitudes	<ul style="list-style-type: none"> <li>3.1 Commitment to occupational health and safety</li> <li>3.2 Promptness in carrying out activities</li> <li>3.3 Sincere and honest to duties</li> <li>3.4 Environmental concerns</li> <li>3.5 Eagerness to learn</li> <li>3.6 Tidiness and timeliness</li> <li>3.7 Respect for rights of peers and seniors in the workplace</li> <li>3.8 Communication with peers, subordinates and seniors in the workplace</li> </ul>
4 Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>4.1 Workplace (actual or simulated)</li> <li>4.2 Tools, equipment and facilities appropriate to processes or activity</li> <li>4.3 Materials relevant to the proposed activity</li> </ul>

### Assessment Evidence Guide

1. Critical Aspects of Competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 identified different types of cranes and forklifts.</li> <li>1.2 described major components of crane and forklift.</li> <li>1.3 explained functions and working systems.</li> <li>1.4 identified common worksite hazards.</li> <li>1.5 interpreted safety signs and indicators.</li> <li>1.6 identified basic hand tools and power tools.</li> </ul>
2. Methods of Assessment	<p>Competency should be assessed by:</p> <ul style="list-style-type: none"> <li>2.1 Written test</li> </ul>

	<p>2.2 Practical Demonstration</p> <p>2.3 Oral Questioning</p> <p>2.4 Portfolio (Optional)</p>
3. Context of Assessment	<p>3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training.</p> <p>3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.</p>

<b>Unit of Competency:</b> <b>CONDUCT CRANE PRE-OPERATION INSPECTION</b>	<b>Nominal Duration:</b> 15 Hrs.	<b>Unit Code:</b> SICIP-CON-CAF-02-O
<b>Unit Descriptor:</b>  This unit covers the skills, knowledge and attitudes required to conduct crane pre-operation inspection. It specifically includes the tasks of inspecting boom, hook, wire, rope and lifting devices, checking outriggers and support systems, checking operational control, brakes, alarms and signals, reviewing load charts and checking fuel, battery, coolant and engine oil levels.		

**Elements and Performance Criteria:**

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

<b>Elements of Competency</b>	<b>Performance Criteria</b>
1. Inspect boom, hook, wire rope, and lifting devices.	1.1 Boom sections are inspected for cracks, bends, or structural deformation. 1.2 Hook is checked for wear, distortion, or improper safety latch function. 1.3 Wire rope is checked for broken strands, kinks, corrosion, or fraying. 1.4 Sheaves, pulleys, and lifting attachments are inspected for smooth operation. 1.5 Load block and swivels are checked for proper alignment and condition. 1.6 Defective or unsafe lifting components are reported immediately.
2. Check outriggers and support systems.	2.1 Outriggers are inspected for structural integrity and alignment. 2.2 Outrigger pads and floats are placed properly and checked for stability. 2.3 Hydraulic cylinders are examined for leaks, damage, or abnormal movement. 2.4 Ground conditions around the crane are assessed for adequate support. 2.5 Warning labels and locks on the outrigger system are verified. 2.6 Any weakness or instability is identified and reported.
3. Check operational controls, brakes, alarms, and signals.	3.1 <b><u>Control levers, joysticks</u></b> , and switches are tested for smooth response. 3.2 Braking systems are checked for proper stopping performance. 3.3 <b><u>Alarms, indicators, and warning lights</u></b> are tested for correct operation. 3.4 Emergency stop functions are tested according to procedures. 3.5 Faulty controls or safety systems are identified and

	reported.
4. Review load charts.	<p>4.1 Crane load charts are located and verified for accuracy.</p> <p>4.2 Rated capacity information is reviewed according to boom length and radius.</p> <p>4.3 <b>Limits</b> are interpreted.</p> <p>4.4 Restrictions and safety notes on the load chart are understood.</p> <p>4.5 Any uncertainty in load capacity is identified before operation.</p>
5. Check fuel, battery, coolant and engine oil levels.	<p>5.1 Fuel level is checked to ensure adequate operation time.</p> <p>5.2 Battery condition and terminals are inspected for corrosion or loose connections.</p> <p>5.3 Coolant level is verified for proper engine temperature control.</p> <p>5.4 Engine oil level is checked and compared with recommended limits.</p> <p>5.5 Leaks or abnormal fluid conditions are identified and reported.</p>

### Range of Variables

Variable	Range (Includes but not limited to):
1. Control levers, joysticks	<p>1.1 Outriggers</p> <p>1.2 Swing lock lever</p> <p>1.3 Travel control lever</p> <p>1.4 Throttle control lever</p> <p>1.5 Brake control lever</p> <p>1.6 Jib angle and extension</p> <p>1.7 Pull and push button</p> <p>1.8 Swing left and right push button</p> <p>1.9 Hook control push button</p> <p>1.10 Boom extension</p>
2. Alarms, indicators, and warning lights	<p>2.1 Overload</p> <p>2.2 Temperature</p> <p>2.3 Fluid level/fuel level</p> <p>2.4 Oil pressure</p> <p>2.5 Hydraulic system</p> <p>2.6 Electrical indicators</p> <p>2.7 Low battery indicators</p> <p>2.8 Boom angle indicators</p> <p>2.9 Swing angle indicators</p> <p>2.10 Radius indicators</p>
3. Limits	<p>3.1 Lifting angles</p> <p>3.2 Counterweights</p> <p>3.3 Configurations</p> <p>3.4 Boom angle</p> <p>3.5 Working radius</p>

	3.6 Outriggers position
	3.7 Boom length

### Curricular Content Guide

1. Underpinning Knowledge	<p>1.1 Basic concept of crane lifting components.</p> <p>1.2 Key indicators of wear, distortion, corrosion, fraying, or misalignment in lifting devices and why they matter.</p> <p>1.3 Fundamental idea of outrigger systems.</p> <p>1.4 Understanding common operational controls, braking systems, alarms, indicators, and emergency stop functions on cranes.</p> <p>1.5 Purpose and interpretation of crane load charts.</p> <p>1.6 Basic understanding of required fuel, battery, coolant, and engine oil levels for safe crane operation.</p> <p>1.7 Recognition of fluid leaks, abnormal conditions, corrosion, or loose connections as maintenance-related hazards.</p> <p>1.8 Importance of identifying and reporting defective or unsafe components immediately to prevent accidents.</p>
2. Underpinning Skills	<p>2.1 Inspecting boom, hook, wire rope, and lifting devices for defects.</p> <p>2.2 Checking outriggers, pads, and support systems for stability.</p> <p>2.3 Testing operational controls, brakes, alarms, and safety signals.</p> <p>2.4 Interpreting and reviewing crane load charts and rated capacities.</p> <p>2.5 Checking fuel, battery, coolant, and engine oil levels.</p> <p>2.6 Identifying faults, leaks, or unsafe components and reporting them promptly.</p> <p>2.7 Assessing ground conditions and overall crane readiness before operation.</p>
3. Underpinning Attitudes	<p>3.1 Commitment to occupational health and safety</p> <p>3.2 Promptness in carrying out activities</p> <p>3.3 Sincere and honest to duties</p> <p>3.4 Environmental concerns</p> <p>3.5 Eagerness to learn</p> <p>3.6 Tidiness and timeliness</p> <p>3.7 Respect for rights of peers and seniors in the workplace</p> <p>3.8 Communication with peers, subordinates and seniors in the workplace</p>
4 Resource Implications	<p>The following resources must be provided:</p> <p>4.1 Workplace (actual or simulated)</p> <p>4.2 Tools, equipment and facilities appropriate to processes or activity</p>

	4.3 Materials relevant to the proposed activity
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### Assessment Evidence Guide

1. Critical Aspects of Competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 inspected boom, hook, wire rope, and lifting devices.</li> <li>1.2 checked outriggers and support systems.</li> <li>1.3 checked operational controls, brakes, alarms, and signals.</li> <li>1.4 reviewed load charts.</li> <li>1.5 checked fuel, battery, coolant and engine oil levels.</li> </ul>
2. Methods of Assessment	<p>Competency should be assessed by:</p> <ul style="list-style-type: none"> <li>2.1 Written test</li> <li>2.2 Practical Demonstration</li> <li>2.3 Oral Questioning</li> <li>2.4 Portfolio (Optional)</li> </ul>
3. Context of Assessment	<ul style="list-style-type: none"> <li>3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training.</li> <li>3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.</li> </ul>

<b>Unit of Competency:</b> <b>OPERATE CRANE FOR LIFTING OPERATIONS</b>	<b>Nominal Duration:</b> 170 Hrs.	<b>Unit Code:</b> SICIP-CON-CAF-03-O
<b>Unit Descriptor:</b>  This unit covers the skills, knowledge and attitudes required to operate crane for lifting operations. It specifically includes the tasks of positioning crane on site correctly, preparing crane for lifting tasks, lifting, swing and lower loads safely, communicating using standard hand signals and radios, maintaining stability and safe load control and shutting down crane and secure it after operations.		

**Elements and Performance Criteria:**

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

<b>Elements of Competency</b>	<b>Performance Criteria</b>
1. Position crane on site correctly.	1.1 Site conditions, ground stability, and hazards are assessed before positioning. 1.2 Crane is positioned according to lift plan and site layout requirements. 1.3 Clearances from power lines, structures, and obstacles are verified. 1.4 Outriggers or stabilizers are deployed as per manufacturer guidelines. 1.5 Crane alignment with the load and lift path is confirmed. 1.6 Unsafe ground or unstable surfaces are reported immediately.
2. Prepare crane for lifting tasks.	2.1 Pre-lift checks are completed according to operating procedures. 2.2 <b><u>Attachments and Binders</u></b> are inspected for suitability. 2.3 Load weight and center of gravity are confirmed before attachment. 2.4 Boom length, radius, and configuration are set based on the lift plan. 2.5 Safety devices and alarms are tested for correct operation. 2.6 <b><u>Communication system</u></b> is confirmed with the signal person.
3. Lift, swing, and lower loads safely.	3.1 Load is lifted gradually to check balance and rigging security. 3.2 Boom and swing movements are controlled smoothly to avoid shock loading. 3.3 Lift path is monitored continuously to avoid obstacles or personnel. 3.4 Load is kept within rated capacity according to boom radius and angle. 3.5 Lowering is performed slowly to maintain stability and accuracy.

	<p>3.6 Any abnormal noise, vibration, or instability is identified and reported.</p> <p>3.7 Lift, swing, and lowering operations are performed according to safety procedures.</p>
4. Communicate using standard hand signals and radios.	<p>4.1 Standard crane hand signals are identified and followed during operation.</p> <p>4.2 Radio communication is used clearly and professionally.</p> <p>4.3 Instructions from the signal person or supervisor are acknowledged promptly.</p> <p>4.4 Any unclear or conflicting signals are clarified before continuing.</p> <p>4.5 Emergency stop signals are recognized and acted upon immediately.</p>
5. Maintain stability and safe load control.	<p>5.1 Load is kept close to the ground when moving to increase stability.</p> <p>5.2 Crane movements are adjusted to prevent sway or sudden shifts.</p> <p>5.3 Rated lifting capacity is followed to avoid overloading.</p> <p>5.4 Wind speed and weather conditions are monitored continuously.</p> <p>5.5 Outriggers and mats are checked during operation for secure footing.</p> <p>5.6 Center of gravity and load balance is maintained throughout the lift.</p>
6. Shut down crane and secure it after operations.	<p>6.1 Outriggers are retracted properly.</p> <p>6.2 Boom is lowered and secured according to manufacturer procedures.</p> <p>6.3 Crane is parked in a safe and designated area after use.</p> <p>6.4 Keys, locks, and safety devices are secured to prevent unauthorized use.</p> <p>6.5 Engine is shut down safely and controls are set to neutral.</p> <p>6.6 Post-operation checks are completed and logbook is maintained.</p>

### Range of Variables

Variable	Range (Includes but not limited to):
1. Attachment and Binders	<p><b>Binders</b></p> <p>1.1 Slings</p> <p>1.2 Shackles</p> <p>1.3 Hooks</p> <p>1.4 Rope</p> <p>1.5 Turnbuckle</p> <p><b>Attachments</b></p> <p>1.6 Lifting sling</p> <p>1.7 Lifting beam</p>

	<ul style="list-style-type: none"> <li>1.8 Jib</li> <li>1.9 Clamp shell bucket</li> <li>1.10 Concrete bucket</li> <li>1.11 Magnet bucket</li> <li>1.12 Pipe lifting bucket</li> </ul>
2. Communication system	<ul style="list-style-type: none"> <li>2.1. Hand signals</li> <li>2.2. Radio</li> <li>2.3. Visual signs</li> <li>2.4. Emergency communication</li> <li>2.5. Audible signals</li> </ul>

### Curricular Content Guide

1. Underpinning Knowledge	<ul style="list-style-type: none"> <li>1.1 Basic concept of proper crane positioning.</li> <li>1.2 Understanding hazards around a crane setup.</li> <li>1.3 Key ideas behind pre-lift preparation.</li> <li>1.4 Fundamental principles of crane lifting, swinging, and lowering.</li> <li>1.5 Importance of monitoring noises, vibrations, and stability indicators to detect unsafe conditions.</li> <li>1.6 Concept of standard hand signals and radio communication.</li> <li>1.7 Basic principles of maintaining crane stability and ensuring proper outrigger support.</li> <li>1.8 Importance of load balance, center of gravity, and preventing sway or sudden movement during operation.</li> <li>1.9 Key concepts related to safe crane shutdown and post-operation checks.</li> </ul>
2. Underpinning Skills	<ul style="list-style-type: none"> <li>2.1 Positioning the crane safely according to site layout and lift plans.</li> <li>2.2 Preparing the crane for lifting by completing checks and setting configurations.</li> <li>2.3 Lifting, swinging, and lowering loads smoothly and within capacity limits.</li> <li>2.4 Communicating clearly using standard hand signals and radios.</li> <li>2.5 Maintaining load stability and monitoring site and weather conditions.</li> <li>2.6 Shutting down and securing the crane after operations.</li> <li>2.7 Identifying and reporting hazards, instability, or abnormal machine behavior.</li> </ul>
3. Underpinning Attitudes	<ul style="list-style-type: none"> <li>3.1. Commitment to occupational health and safety</li> <li>3.2. Promptness in carrying out activities</li> <li>3.3. Sincere and honest to duties</li> <li>3.4. Environmental concerns</li> <li>3.5. Eagerness to learn</li> <li>3.6. Tidiness and timeliness</li> <li>3.7. Respect for rights of peers and seniors in the workplace</li> </ul>

	3.8. Communication with peers, subordinates and seniors in the workplace
4. Resource Implications	<p>The following resources must be provided:</p> <p>4.1 Workplace (actual or simulated)</p> <p>4.2 Tools, equipment and facilities appropriate to processes or activity</p> <p>4.3 Materials relevant to the proposed activity</p> <p>4.4 Relevant manuals</p>

### Assessment Evidence Guide

1. Critical Aspects of Competency	<p>Assessment required evidence that the candidate:</p> <p>1.1 positioned crane on site correctly.</p> <p>1.2 prepared crane for lifting tasks.</p> <p>1.3 lifted, swing, and lower loads safely.</p> <p>1.4 communicated using standard hand signals and radios.</p> <p>1.5 maintained stability and safe load control.</p> <p>1.6 shut down crane and secure it after operations.</p>
2. Methods of Assessment	<p>Competency should be assessed by:</p> <p>2.1 Written test</p> <p>2.2 Practical Demonstration</p> <p>2.3 Oral Questioning</p> <p>2.4 Portfolio (Optional)</p>
3. Context of Assessment	<p>3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training.</p> <p>3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.</p>

<b>Unit of Competency:</b> <b>PERFORM FORKLIFT PRE-OPERATION CHECKS</b>	<b>Nominal Duration:</b> 10 Hrs.	<b>Unit Code:</b> SICIP-CON-CAF-04-O
<b>Unit Descriptor:</b>		
This unit covers the skills, knowledge and attitudes required to perform forklift pre-operation checks. It specifically includes the tasks of inspecting forks, mast, chains, hydraulics and tires, checking fuel, battery, coolant and engine oil levels, testing brakes, steering, lights and warning devices, verifying load rating, fork spacing and load condition and identifying unsafe workplace conditions.		

### Elements and Performance Criteria:

(Terms in the performance criteria that are written in **bold and underlined>** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Inspect forks, mast, chains, hydraulics, and tires.	1.1 Forks are inspected for cracks, bends, and wear. 1.2 Mast is checked for alignment, damage, and smooth movement. 1.3 Lifting chain is examined for proper tension and signs of wear or rust. 1.4 Hydraulic hoses and fittings are checked for leaks and damage. 1.5 Fluid cylinders are inspected for proper seal condition and operation. 1.6 Tires are checked for pressure, tread wear, and cuts.
2. Check fuel, battery, coolant, and engine oil levels.	2.1 Fuel level is checked to ensure adequate operation time. 2.2 Battery charge and terminals are inspected for corrosion or loose connections. 2.3 Coolant level is verified for proper engine temperature control. 2.4 Engine oil level is checked against manufacturer recommendations. 2.5 Hydraulic fluid and transmission oil levels are checked.
3. Test brakes, steering, lights, and warning devices.	3.1 Foot brake and parking brake are tested for proper function. 3.2 Steering is checked for smooth and responsive movement. 3.3 Lights, headlights, tail lights, and indicators are tested. 3.4 Horn, reverse alarm, and other warning devices are checked for audibility. 3.5 Dashboard indicators and warning lights are verified. 3.6 Emergency stop functions are tested where applicable.
4. Verify load rating, fork	4.1 Forklift load rating is checked against the load to be

spacing, and load condition.	<p>lifted.</p> <p>4.2 Fork spacing is adjusted according to load width and stability requirements.</p> <p>4.3 Load center is verified to prevent tipping or imbalance.</p> <p>4.4 Pallets and load surfaces are inspected for damage or instability.</p> <p>4.5 Load weight is confirmed to be within safe lifting limits.</p> <p>4.6 <b>Attachments</b> are checked for compatibility and security.</p>
5. Identify unsafe workplace conditions.	<p>5.1 Floor surfaces are inspected for cracks, spills, debris, or uneven areas.</p> <p>5.2 Aisles, pathways, and turning spaces are checked for clearance.</p> <p>5.3 Blind spots, intersections, and pedestrian zones are reviewed for risk.</p> <p>5.4 Overhead obstructions are identified.</p> <p>5.5 Poor lighting or visibility issues are noted and reported.</p> <p>5.6 Environmental hazards assessed.</p>

### Range of Variables

Variable	Range (Includes but not limited to):
1. Attachments	<p>1.1 Fork</p> <p>1.2 Bell/ paper roll clamp</p> <p>1.3 Box clamp</p> <p>1.4 Tobacco clamp</p> <p>1.5 Cartoon clamp</p> <p>1.6 Drum/barrel clamp</p> <p>1.7 Side shifter</p>

### Curricular Content Guide

1. Underpinning Knowledge	<p>1.1 Basic concept of forklift lifting components and common signs of wear or damage.</p> <p>1.2 Understanding of hydraulic systems, seals, hoses, cylinders, and why leaks or rust indicate hazards.</p> <p>1.3 Key ideas behind checking operating fluids.</p> <p>1.4 Concept of braking systems, steering systems, lights, alarms, and other warning devices.</p> <p>1.5 Meaning and purpose of dashboard warning lights and emergency stop indicators.</p> <p>1.6 Load rating, load center, fork spacing, pallet condition, and how these factors affect lifting stability and safety.</p> <p>1.7 Importance of verifying forklift attachments for compatibility and secure mounting.</p>
2. Underpinning Skills	2.1 Inspecting forks, mast, chains, hydraulics, and tires for

	<p>defects.</p> <p>2.2 Checking fuel, battery, coolant, oil, and hydraulic levels.</p> <p>2.3 Testing brakes, steering, lights, and warning devices.</p> <p>2.4 Verifying load rating, fork spacing, and load stability.</p> <p>2.5 Identifying unsafe floor, aisle, and workplace conditions.</p> <p>2.6 Assessing environmental and visibility hazards.</p> <p>2.7 Reporting faults or unsafe conditions promptly.</p>
3. Underpinning Attitudes	<p>3.1 Commitment to occupational health and safety</p> <p>3.2 Promptness in carrying out activities</p> <p>3.3 Sincere and honest to duties</p> <p>3.4 Environmental concerns</p> <p>3.5 Eagerness to learn</p> <p>3.6 Tidiness and timeliness</p> <p>3.7 Respect for rights of peers and seniors in the workplace</p> <p>3.8 Communication with peers, subordinates and seniors in the workplace</p>
4 Resource Implications	<p>The following resources must be provided:</p> <p>4.1 Workplace (actual or simulated)</p> <p>4.2 Tools, equipment and facilities appropriate to processes or activity</p> <p>4.3 Materials relevant to the proposed activity</p> <p>4.4 Relevant manuals</p>

### Assessment Evidence Guide

1. Critical Aspects of Competency	<p>Assessment required evidence that the candidate:</p> <p>1.1 inspected forks, mast, chains, hydraulics, and tires.</p> <p>1.2 checked fuel, battery, coolant, and engine oil levels.</p> <p>1.3 tested brakes, steering, lights, and warning devices.</p> <p>1.4 verified load rating, fork spacing, and load condition.</p> <p>1.5 identified unsafe workplace conditions.</p>
2. Methods of Assessment	<p>Competency should be assessed by:</p> <p>2.1 Written test</p> <p>2.2 Practical Demonstration</p> <p>2.3 Oral Questioning</p> <p>2.4 Portfolio (Optional)</p>
3. Context of Assessment	<p>3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training.</p> <p>3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.</p>

<b>Unit of Competency:</b> <b>OPERATE FORKLIFT FOR LOAD HANDLING</b>	<b>Nominal Duration:</b> 75 Hrs.	<b>Unit Code:</b> SICIP-CON-CAF-05-O
<b>Unit Descriptor:</b>  This unit covers the skills, knowledge and attitudes required to operate forklift for load handling. It specifically includes the tasks of starting forklift smoothly and safely, following site rules and signals, lifting, carrying and reposition loads, stacking, arranging and unstacking materials, controlling driving speed and turning movements and parking forklift in a designated safe area.		

### Elements and Performance Criteria:

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Start forklift smoothly and safely.	1.1 Pre-start checks are completed before engine start. 1.2 Engine is started following manufacturer-recommended procedures. 1.3 <b><u>Forklift controls</u></b> are tested for proper response after starting. 1.4 Forks are positioned at a safe travel height before movement. 1.5 Surrounding area is checked for obstacles and personnel.
2. Follow site rules and signals.	2.1 <b><u>Site safety rules</u></b> and traffic guidelines are followed consistently. 2.2 Designated routes and restricted zones are identified and respected. 2.3 Hand signals from supervisors or spotters are interpreted correctly. 2.4 Audible and visual signals are used as required. 2.5 Speed limits and right-of-way rules are followed.
3. Lift, carry, and reposition loads.	3.1 Load weight and stability are checked before lifting. 3.2 Forks are adjusted to the correct spacing for load balance. 3.3 Load is lifted smoothly within the rated capacity. 3.4 Load is carried with forks kept low for increased stability. 3.5 Load is repositioned carefully without sudden or jerky movements. 3.6 Travel path is monitored to avoid collisions or hazards.
4. Stack, arrange, and unstack materials.	4.1 Stacking height and stability requirements are verified. 4.2 Load is positioned accurately before raising for stacking. 4.3 Loads are stacked evenly with proper spacing and alignment. 4.4 Forks are tilted and leveled appropriately during

	<p>stacking and unstacking.</p> <p>4.5 Materials are arranged to maintain safe aisles and access points.</p> <p>4.6 Weak or damaged pallets are identified and avoided.</p>
5. Control driving speed and turning movements.	<p>5.1 Speed is adjusted according to load weight, surface condition, and visibility.</p> <p>5.2 Slow and controlled turns are performed to maintain stability.</p> <p>5.3 Forklift is driven with caution over slopes, ramps, and uneven surfaces.</p> <p>5.4 Sudden braking or sharp turns are avoided to prevent tipping.</p> <p>5.5 Clear visibility is maintained throughout movement.</p>
6. Park forklift in a designated safe area.	<p>6.1 A designated parking area is identified before stopping.</p> <p>6.2 Forklift is brought to a complete stop using proper braking.</p> <p>6.3 Forks are lowered fully to the ground.</p> <p>6.4 Parking brake is applied securely.</p> <p>6.5 Engine is shut down and controls are returned to neutral.</p> <p>6.6 Log book is maintained.</p>

### Range of Variables

Variable	Range (Includes but not limited to):
1. Forklift controls	<p>1.1 Accelerator</p> <p>1.2 Brake pedal</p> <p>1.3 Clutch pedal</p> <p>1.4 Steering wheel</p> <p>1.5 Parking brake</p> <p>1.6 Direction lever</p> <p>1.7 Lift lever</p> <p>1.8 Tilt lever</p> <p>1.9 Side-shift lever</p> <p>1.10 Horn</p> <p>1.11 Light switch</p>
2. Site safety rules	<p>2.1 Wear PPE</p> <p>2.2 Follow speed limits</p> <p>2.3 Obey signs and signals/ color code</p> <p>2.4 Keep to marked routes</p> <p>2.5 Maintain safe distance</p> <p>2.6 Use horn at blind spots</p> <p>2.7 Avoid overloading</p> <p>2.8 Keep forks low while driving</p> <p>2.9 No passengers</p> <p>2.10 Park in designated areas</p>

## Curricular Content Guide

<p>1. Underpinning Knowledge</p>	<p>1.1 Concept of pre-start inspection requirements and why a forklift must be checked before engine start.</p> <p>1.2 Understanding of basic forklift engine start-up principles and control response checks.</p> <p>1.3 Purpose of keeping forks at a safe travel height and checking the surrounding area before movement.</p> <p>1.4 Site safety rules, traffic patterns, restricted zones, hand signals, audible signals, visual signals, and why operators must follow them.</p> <p>1.5 Concepts of load weight, load stability, fork spacing, and rated capacity for safe lifting and carrying.</p> <p>1.6 Principles of stable load movement, low-fork travel, smooth repositioning, and continuous path monitoring.</p> <p>1.7 Basic principles of safe parking, lowering forks, applying brakes, engine shutdown.</p>
<p>2. Underpinning Skills</p>	<p>2.1 Starting and operating the forklift smoothly and safely.</p> <p>2.2 Following site rules, traffic guidelines, and hand signals.</p> <p>2.3 Lifting, carrying, and repositioning loads within capacity.</p> <p>2.4 Stacking and unstacking materials accurately and safely.</p> <p>2.5 Controlling driving speed, turning radius, and stability.</p> <p>2.6 Parking, lowering forks, and shutting down the forklift properly.</p> <p>2.7 Maintaining awareness of surroundings and avoiding hazards.</p>
<p>3. Underpinning Attitudes</p>	<p>3.1 Commitment to occupational health and safety</p> <p>3.2 Promptness in carrying out activities</p> <p>3.3 Sincere and honest to duties</p> <p>3.4 Environmental concerns</p> <p>3.5 Eagerness to learn</p> <p>3.6 Tidiness and timeliness</p> <p>3.7 Respect for rights of peers and seniors in the workplace</p> <p>3.8 Communication with peers, subordinates and seniors in the workplace</p>
<p>4 Resource Implications</p>	<p>The following resources must be provided:</p> <p>4.1 Workplace (actual or simulated)</p> <p>4.2 Tools, equipment and facilities appropriate to processes or activity</p> <p>4.3 Materials relevant to the proposed activity</p> <p>4.4 Relevant manuals</p>

## Assessment Evidence Guide

<p>1. Critical Aspects of Competency</p>	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 started forklift smoothly and safely.</li> <li>1.2 followed site rules and signals.</li> <li>1.3 lifted, carry, and reposition loads.</li> <li>1.4 stacked, arrange, and unstack materials.</li> <li>1.5 controlled driving speed and turning movements.</li> <li>1.6 parked forklift in a designated safe area.</li> </ul>
<p>2. Methods of Assessment</p>	<p>Competency should be assessed by:</p> <ul style="list-style-type: none"> <li>2.1 Written test</li> <li>2.2 Practical Demonstration</li> <li>2.3 Oral Questioning</li> <li>2.4 Portfolio (Optional)</li> </ul>
<p>3. Context of Assessment</p>	<ul style="list-style-type: none"> <li>3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training.</li> <li>3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.</li> </ul>

<b>Unit of Competency:</b> <b>MAINTAIN CRANE AND FORKLIFT EQUIPMENT</b>	<b>Nominal Duration:</b> 30 Hrs.	<b>Unit Code:</b> SICIP-CON-CAF-06-O
<b>Unit Descriptor:</b>  This unit covers the skills, knowledge and attitudes required to maintain crane and forklift equipment. It specifically includes the tasks of cleaning machines and removing debris after use, lubricating moving and high-wear parts, replacing basic components, monitoring fuel and battery levels and storing tools, attachments and accessories.		

**Elements and Performance Criteria:**

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

<b>Elements of Competency</b>	<b>Performance Criteria</b>
1. Clean machines and remove debris after use.	1.1 Approved <b><u>cleaning tools and chemicals</u></b> are used according to guidelines. 1.2 Machine surfaces are cleaned to remove dirt, mud, and debris after operation. 1.3 Cab, controls, and windows are wiped to ensure visibility and hygiene. 1.4 Undercarriage/structure, forks, booms, and attachments are cleaned thoroughly. 1.5 Waste materials and cleaning residues are disposed of safely.
2. Lubricate moving and high-wear parts.	2.1 <b><u>Lubrication points</u></b> are identified from the maintenance manual. 2.2 Grease and lubricants are applied to pins, joints, chains, and sliding parts. 2.3 Correct <b><u>lubricant types</u></b> are selected and used appropriately. 2.4 Excess grease or oil is removed to prevent hazards. 2.5 Lubrication intervals are followed according to manufacturer instructions.
3. Replace basic components.	3.1 <b><u>Basic components</u></b> are identified for replacement. 3.2 Old or damaged parts are removed safely using proper tools. 3.3 Replacement parts are installed according to manufacturer specifications. 3.4 Replaced components are tested to confirm proper operation. 3.5 Unsafe or incompatible parts are reported before installation. 3.6 Work area is cleaned after replacement activities.
4. Monitor fuel and battery levels.	4.1 Fuel levels are checked regularly to ensure continuous operation. 4.2 Battery terminals, cables, connectors and connections are inspected.

	<p>4.3 Battery charge is monitored and maintained as required.</p> <p>4.4 Electrolyte level in lead-acid batteries is checked where applicable.</p> <p>4.5 Leaks or abnormalities in fuel or battery systems are reported.</p> <p>4.6 Refueling and battery charging are performed safely.</p>
5. Store tools, attachments, and accessories.	<p>5.1 Tools and attachments are cleaned before storage.</p> <p>5.2 Accessories are placed in designated storage areas.</p> <p>5.3 Hazardous materials like oils and chemicals are stored safely.</p> <p>5.4 Storage racks, boxes, and cabinets are kept organized.</p> <p>5.5 Tools are inspected for wear or damage before storing.</p>

### Range of Variables

Variable	Range (Includes but not limited to):
1. Cleaning tools and chemicals	<p><b>Cleaning tools</b></p> <p>1.1 Brush</p> <p>1.2 Scraper</p> <p>1.3 Cloth</p> <p>1.4 Air blower</p> <p>1.5 Water hose</p> <p><b>Cleaning chemicals</b></p> <p>1.6 Degreaser</p> <p>1.7 Detergent</p> <p>1.8 Parts cleaner</p> <p>1.9 Rust remover</p>
2. Lubrication points	<p><b>Crane</b></p> <p>2.1 Boom section/telescope side</p> <p>2.2 Swing bearing</p> <p>2.3 Hoist drum</p> <p>2.4 Hydraulic cylinder pins and pivot</p> <p>2.5 Outriggers/extended beam</p> <p>2.6 Wear rope</p> <p>2.7 Winch and drum bearing</p> <p><b>Forklift</b></p> <p>2.8 Mast (chain and channel)</p> <p>2.9 Tilt cylinder pivot point</p> <p>2.10 Side shifter</p> <p>2.11 Control lever linkages</p> <p>2.12 Steering linkages</p>
3. Lubricant types	<p>3.1 Engine oil (SAE-15W-40)</p> <p>3.2 Gear oil (SAE-80W-90)</p> <p>3.3 Hydraulic fluid (ISO VG 68)</p>
4. Basic components	<p><b>Crane</b></p> <p>4.1 Fuel filter</p>

	<p>4.2 Oil filter</p> <p>4.3 Air filter</p> <p>4.4 Water separator filter</p> <p>4.5 Pilot filter</p> <p>4.6 Hydraulic filter</p> <p>4.7 Transmission filter</p> <p>4.8 Electrical fuse</p> <p>4.9 Belts</p> <p><b>Forklift</b></p> <p>4.10 Fuel filter</p> <p>4.11 Oil filter</p> <p>4.12 Air filter</p> <p>4.13 Pilot filter</p> <p>4.14 Hydraulic filter</p> <p>4.15 Transmission filter</p> <p>4.16 Electrical fuse</p> <p>4.17 Belts</p>
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### Curricular Content Guide

1. Underpinning Knowledge	<p>1.1 Concept of proper machine cleaning and why removing dirt, mud, and debris helps maintain performance and safety.</p> <p>1.2 Understanding of cleaning tools, chemicals, and safe disposal practices for waste materials and residues.</p> <p>1.3 Basic idea of lubrication points, lubricant types, high-wear parts, and why regular lubrication reduces friction and damage.</p> <p>1.4 Knowledge of how to identify components that require replacement and the importance of selecting correct and safe parts.</p> <p>1.5 Key understanding of fuel levels, battery charge, terminals, connectors, and electrolyte conditions for reliable machine operation.</p> <p>1.6 Purpose of safe refueling and battery-charging practices to prevent accidents.</p> <p>1.7 Understanding of proper storage for tools, attachments, accessories, and hazardous materials.</p>
2. Underpinning Skills	<p>2.1 Cleaning machines and removing debris after use.</p> <p>2.2 Lubricating moving and high-wear parts correctly.</p> <p>2.3 Replacing basic components safely and accurately.</p> <p>2.4 Monitoring fuel and battery levels and identifying abnormalities.</p> <p>2.5 Performing safe refueling and battery charging.</p> <p>2.6 Storing tools, attachments, and accessories properly.</p> <p>2.7 Reporting unsafe or incompatible parts and maintaining a clean work area.</p>
3. Underpinning Attitudes	<p>3.1 Commitment to occupational health and safety</p>

	<ul style="list-style-type: none"> <li>3.2 Promptness in carrying out activities</li> <li>3.3 Sincere and honest to duties</li> <li>3.4 Environmental concerns</li> <li>3.5 Eagerness to learn</li> <li>3.6 Tidiness and timeliness</li> <li>3.7 Respect for rights of peers and seniors in the workplace</li> <li>3.8 Communication with peers, subordinates and seniors in the workplace</li> </ul>
4. Resource Implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>4.1 Workplace (actual or simulated)</li> <li>4.2 Tools, equipment and facilities appropriate to processes or activity</li> <li>4.3 Materials relevant to the proposed activity</li> <li>4.4 Relevant manuals</li> </ul>

### Assessment Evidence Guide

1. Critical Aspects of Competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 cleaned machines and remove debris after use.</li> <li>1.2 lubricated moving and high-wear parts.</li> <li>1.3 replaced basic components.</li> <li>1.4 monitored fuel and battery levels.</li> <li>1.5 stored tools, attachments, and accessories.</li> </ul>
2. Methods of Assessment	<p>Competency should be assessed by:</p> <ul style="list-style-type: none"> <li>2.1 Written test</li> <li>2.2 Practical Demonstration</li> <li>2.3 Oral Questioning</li> <li>2.4 Portfolio (Optional)</li> </ul>
3. Context of Assessment	<ul style="list-style-type: none"> <li>3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training.</li> <li>3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.</li> </ul>

### End of the Competency Standard

## Workshop/Lab Facility Standard

<b>Course Name:</b>	Heavy Equipment Operation (Crane and Forklift)
<b>Number of Trainees:</b>	25

### Course-wise Training Space (Theoretical Classroom, Workshop/ Lab/ Classroom cum Workshop):

- Classroom – 350 sft (33 sqm)
- Workshop/ lab – 800 sft (75 sqm)
- OR
- Classroom cum workshop – 1000 sft (93 sqm)

### Major Training Equipment and Training Facilities:

S. N.	Major Equipment and Training facilities	Required facilities
1.	Computer/laptop	01
2.	Multimedia projector	01
3.	Crane	01
4.	Crane attachments (clamp shell bucket)	01
5.	Forklift	01
6.	Forklift Attachments (carton clamp)	01
7.	Blower	02
8.	Air Compressor	02
9.	Air pressure gauge	01
10.	Spanner set	05
11.	Filter opener set	05
12.	Allen key set	05
13.	Socket set	05
14.	Screwdriver set	05
15.	Pliers	05
16.	Hammer	05
17.	Hydraulic jack (crane and forklift)	02
18.	Torque wrench	05
19.	Grease gun	05

The following conditions must be fulfilled –

- The institute shall not use the same facilities for any other projects/organizations offering a similar course.
- The institute must provide sufficient evidence to prove ownership of the proposed training equipment.

The list denotes the minimum training equipment and facility required to effectively conduct training for a specific course. Additionally, the institute must ensure that all other necessary training tools, equipment, and furniture are available to meet the requirement of competency standards (CS) provided by SICIP.

For the operation of training course on Heavy Equipment Operation (Crane and Forklift), the institute must ensure the availability of at least 80% of the major training equipment and training facilities (according to the CS) to be eligible for SICIP training delivery. If the score is below 80%, the remaining equipment and facilities need to be installed before the commencement of the training.

The institute will also provide all other hand tools and power tools as per CS for 25 trainees. Also, they will arrange adequate seating arrangement and classroom setup for the 25 trainees.