



Model Curriculum

QP Name: Crawler Crane Operator

QP Code: IES/Q0110

QP Version: 3.0

NSQF Level: 4

Model Curriculum Version: 1.0

Infrastructure Equipment Skill Council (IESC). Jubilee Building (Second Floor), No.45, Museum Road, Bengaluru - 560025

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Training Parameters

Sector	Infrastructure Equipment
Sub-Sector	Equipment Operation
Occupation	Operator
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8343.0500
Minimum Educational Qualification and Experience	8th Grade pass with 2 year NTC plus 1 year NAC OR 10th Grade pass plus 1 year NTC/ NAC OR 10th Grade pass with 2 years of relevant experience OR 10th Grade pass and pursuing continuous schooling OR 11th Grade Pass OR IES/Q0111 - Junior Operator Crane NSQF Level 3 with minimum education as 5th Grade pass with 2 year relevant experience
Pre-Requisite License or Training	NIL
Minimum Job Entry Age	18 Years
Last Reviewed On	17/11/2022
Next Review Date	17/11/2025
NSQC Approval Date	17/11/2022
QP Version	3.0
Model Curriculum Creation Date	30/10/2022
Model Curriculum Valid Up to Date	17/11/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	420 Hours
Maximum Duration of the Course	420 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should be able to:

- Outline the organization's procedures and guidelines related to Crawler Crane operations.
- Describe the controls, levers and switches in order to operate the Crawler Crane properly.
- Explain the roles and responsibilities of the Crawler Crane Operator.
- Demonstrate the procedure to carry out all pre-use and running checks.
- Explain how to record machine running hours to determine the best service plan.
- Describe the guidelines for health, safety and security requirements.
- Prepare and maintain the logbook to keep track of all actions

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	4	0	0	0	4
NOS Code – IES/N 0128 NOS Name: Carry out pre – operation checks on Crawler Crane NOS Version - 2.0 NSQF Level - 4	30	30	60	0	120
NOS Code – IES/N 0129 NOS Name – Operate Crawler crane NOS Version - 2.0 NSQF Level - 4	30	60	30	0	120
NOS Code - IES/N 0130 NOS Name - Perform routine maintenance and troubleshooting of a Crawler Crane NOS Version - 2.0 NSQF Level – 4	30	30	60	0	120
NOS Code - IES/N 7601 NOS Name - Comply with worksite health and safety guidelines NOS Version - 2.0 NSQF Level - 4		30	0	0	30
NOS Code- NG-Lx-ES-00001-2022-v1-DGT NOS Name - Employability Skills 30 hrs NOS Version- 1.0	0	30	0	0	30
Total Duration	90	180	150	0	420

Module Details

Module 1: Orientation

Bridge Module

Terminal Outcomes:

- Describe the operations of the Infrastructure Industry in India.
- Outline the skill training schemes in the Skill Sector Councils.
- Discuss the different types of job roles available in IESC.
- Explain the roles and responsibilities of the Crawler Crane Operator.

Duration: <4:00>	Duration: <0:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the scope of employment opportunities in the industry. • Explain the roles and responsibilities of the Crawler Crane Operator. • Describe the different technical trainings conducted in SSC. • 	NIL
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster	
Tools, Equipment and Other Requirements	

Module 2: Pre-op checks on Crawler Crane Operator

Mapped to NOS Code – IES/N0128 v 2.0

Terminal Outcomes:

- Explain the organization's performance standards and procedures related to Crawler Crane operations.
- Explain the responsibilities of the assigned job role.
- Know the basic working of engine and all systems of the Crawler Crane.
- Prepare and maintain a logbook to keep timely track of all actions.
- Understand the risks and consequences of not adhering to established processes and job instructions.

- Know the reporting structure in the organization, schedule for resolving the complaint/problem and escalation matrix for reporting unresolved problems.
- Know the emergency organization of the specific work site.

Duration: <30:00>	Duration: <90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List various types of Crawler Crane and their functions. • Read and understand the guidelines in the safety and operational manual of the OEM. • Plan work according to the required schedule and location. • Explain the importance of the routine maintenance checklist. • Elucidate the hoist mechanism and its usage. • Elaborate the engine, hydraulic & electrical functions of a crawler crane. • Explain the working of the controls, levers and switches required to effectively operate the Crawler Crane. • Describe the use of various tools provided with the machine and where the tool kit is stored. • Know about all the typical occupational hazards and techniques to overcome them. • Know about the various types of hand signals & emergency signs used on the site. • Explain the relevance of greasing and lubrication of the Crawler Crane components that require routine lubrication. • Record any deviations or occurrences that do not conform to the specified standards. • Know the escalation matrix for reporting unresolved problems. • List methods to enhance the operational efficiency of the Crawler Crane. 	<ul style="list-style-type: none"> • Prepare a logbook to record all actions completed prior to operating the Crawler Crane. • Demonstrate the procedure to check for hydraulic oil leaks. • Elaborate the steps to examine the battery for leaks and ensure that the electrolyte level is adequate. • Determine the steps to check that engine oil and fluid levels are as indicated by the manufacturer's operation manual. • Illustrate the method to check that all structural and other key components are in working order, as specified in the operation manual. • Examine the site for cables, potholes or marshy spots where the Crawler Crane might become trapped. • Prepare daily top-up plan of coolants, lubricants and fluids to ensure conformity with manufacturer's specifications. • Hoist and release the load at a low height to ensure that the holding and control breaks are working properly. • Examine the different controls, gauges, warning lights, and other safety devices to ensure that they are working properly. • Create a checklist for pre operation visual inspection of the equipment to detect damage, flaws, cracks or leaks. • Check the hoist limit switches, hitch components, safety chains, crawler track chain and rollers. • Demonstrate how to adjust the operator's seat, rear and side

	<p>mirrors and seat belt for ease of operation.</p> <ul style="list-style-type: none"> • Show how to clean the air filter dust bowls and check that the gasket and inner filter are in good condition. • Demonstrate how to drain water and debris from the fuel tank. • Show how to check fan belt tension, battery electrolyte level and tightness of the terminals.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer's Service and Repair Manual	
Tools, Equipment and Other Requirements	
Safety Gear, Tool Kit, PPE	

Module 3: Operation of a Crawler Crane

Mapped to NOS Code – IES/N0129 v 2.0

Terminal Outcomes:

- Elaborate the company's performance criteria and processes.
- Explain the responsibilities of the operator in his assigned job role.
- Explain the rigging hardware and tool use.
- Expound the government regulations and other regulations imposed by crane safety standards.
- Explain the basic working of the engine and hydraulics.
- Determine the procedure to check that the wind speeds are within the crane's operational limitations.

Duration:<30:00>	Duration:<90:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Outline the organization’s performance standards & procedures. • List different types of Crawler Cranes and their applications and functions. • Know the cost of the equipment and loss to the Organization resulting from its damage and the direct/ indirect cost of accidents. • Summarize the techniques of hoisting operation. • Understand the importance of proper boom extension in accordance with the operation manual. • Explain multi-crane operations. • Elaborate crane tipping prevention techniques. • Expound the various controls, brakes and switches needed to operate the crane effectively. • Explain the use of the emergency stop button to disable all power of the crane. • Outline the procedure to notify the supervisor if a fault is found that is outside the scope of the operator’s job role. • Explain importance of walking around the Crawler Crane before starting it. • Discuss the engine and hydraulics. • Identify the tools in the tool kit and explain their use. • Know the optimal engine oil pressure and radiator coolant temperature. • Identify immediate or temporary solutions to resolve mechanical issues. 	<ul style="list-style-type: none"> • Demonstrate the process to examine the assembly and confirm that all necessary safety precautions have been taken in accordance with the guidelines. • Demonstrate how to use the sling, shackle and chains. • Illustrate how to carry out lifting of load in coordination with rigger. • Show how to monitor stability while moving a load. • Check that the wind speeds are within the crane's operational limitations • Demonstrate how to utilise the priming pump and pre-heater to start the engine in extreme cold weather. • Show how to wear the seatbelt and adjust the seat position • Know position and operation of the emergency stop button. • Describe the instrument panel, its position, and its functionality. • Show steering techniques and the proper way to steer on a slope. • Show how to monitor hazards and risks to ensure safety of self, other personnel, plant and equipment. • Give examples of all signs, warnings, and other emergency signals. • Check that the laydown area is large enough to support the load and is free of obstruction.

<ul style="list-style-type: none"> Learn common hazards in the work area and procedures to deal with them. 	
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer’s Service and Repair Manual	
Tools, Equipment and Other Requirements	
Safety Gear, Tool Kit, PPE	

Module 4: Routine maintenance and trouble shooting

Mapped to NOS Code: IES/N0130 v 2.0

Terminal Outcomes:

- Outline the reporting structure in the company.
- Explain the various control and switches needed to operate the crawler crane properly.
- Elaborate the typical defects and general reasons of failure.
- Determine the best service schedule by monitoring the machine working hours plan.
- Demonstrate the procedure to check the following in the lattice boom, extension boom extension alignment, cords and lattice end connection.

Duration: <30:00>

Duration: <90:00>

Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Summarize the organizations procedures and guidelines related to breakdown & maintenance services. • Define safety protocols to be observed before undertaking any repair. • Define the scope of the position and when and to whom to escalate problems. • Identify common defects and general causes of breakdown. • List parameters to be covered in the periodic maintenance sheet. • Explain the different components of the equipment and their functions. • Outline the underlying mechanical system involved in the crawler crane's various functions. • Determine the possible sources of any unusual sound emanating from the engine and other parts. • Explain the importance of the optimal levels of control indicators e.g. fuel gauge, engine oil pressure and temperature. • Describe the importance of regular cleaning of air filter dust bowls. • Identify prominent places on the equipment for display of safety and maintenance stickers. 	<ul style="list-style-type: none"> • Exhibit the procedure to check for deterioration or leakage in air or hydraulic systems, safe and effective operation of hoses, levels of fluid in pumps and motors, air cleaners needing replacement as per the operation & maintenance manual. • Scrutinise the wire ropes for wear and tear. • Demonstrate the steps to check for deformed, cracked or corroded members in the structure and boom loose bolts or rivets excessive wear on brake and clutch system parts, deformed wedges, defective cotter keys, pins and guard rails. • Check the cables, brakes and levers for poor adjustment or excessive wear. • Check the marking on the load/radius indicator over full range, load moment indicator, boom angle indicator. • Check the working of the anti-two-block system. • Create daily /weekly maintenance sheets in conformance with organization recommendation. • Carry out periodic maintenance as per the checklist. • Demonstrate how to use appropriate props /support devices while doing maintenance. • Demonstrate how to clean the air filter dust bowls. • Prepare a daily top-up plan of coolants, lubricants and fluids to ensure conformity with the manufacturer's specifications. • Demonstrate how to drain water and debris from the fuel tank.

Classroom Aids:
Computer, projector, printer, student table, whiteboard, flip chart, markers and duster Manufacturer's Service and Repair Manual
Tools, Equipment and Other Requirements
Safety Gear, Tool Kit, PPE

Module 5: Health and safety

Mapped to NOS Code: IES/N 7602 v2.0

Terminal Outcomes:

- Describe the guidelines for health, safety and security requirements.
- Identify the common hazards and risks at site.
- Employ safe practices to use the tools and machines.
- Explain emergency procedure to stop and shutdown machinery.
- Carry out basic first-aid treatment for common injuries.
- Demonstrate the operation of firefighting equipment.
- Classify various safety signs, symbols and warnings used at site.

Duration: <10:00>	Duration: <20:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the Health, safety, environmental (HSE) policies of the organization. • Explain the reporting procedure for all HSE activities. • List down the contact details of HSE personnel, in case of emergencies. • Explain safe working practices to avoid common hazards and risks. • Report all health and safety related incidents/accidents. • Classify waste based on non-recyclable, hazardous and recyclable material. 	<ul style="list-style-type: none"> • Show the correct use of Personal Protective Equipment (PPE). • Demonstrate the safe procedure for lifting loads. • Perform the operation of fire extinguishers. • Demonstrate how to give basic first aid. • Prepare a hazard log register to report incidents and accidents. • Conduct a mock drill for dealing with emergencies like fires and other calamities. • Demonstrate safe storage and disposal of waste.
Classroom Aids:	
Computer, projector, printer, student table, whiteboard, flip chart, marker and duster	
Tools, Equipment and Other Requirements	
Fire Extinguishers, Personal Protective Equipment and other safety gears	

Module 6: Employability Skills

Mapped to NOS: NG-Lx-ES-00001-2022-v1-DGT

Terminal Outcomes:

At the end of this module, the learner should have acquired the listed knowledge and skills.

- Discuss the importance of Employability Skills in meeting the job requirements
- Show how to practice different environmentally sustainable practices
- Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mind-set in different situations
- Demonstrate how to communicate in a well -mannered way with others
- Demonstrate working with others in a team
- Show how to conduct oneself appropriately with all genders and PwD

- Discuss the significance of reporting sexual harassment issues in time
- Discuss the significance of using financial products and services safely and securely
- Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws
- Show how to operate digital devices and use the associated applications and features, safely and securely
- Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely
- Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges
- Explain the significance of identifying customer needs and addressing them
- Create a biodata
- Use various sources to search and apply for jobs
- Discuss the significance of dressing up neatly and maintaining hygiene for an interview
- Discuss how to search and register for apprenticeship opportunities
- Describe opportunities as an entrepreneur

Duration: <00:00>	Duration: <30:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Discuss the importance of Employability Skills in meeting the job requirements • Show how to practice different environmentally sustainable practices • Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mind-set in different situations • Demonstrate how to communicate in a well -mannered way with others • Demonstrate working with others in a team • Show how to conduct oneself appropriately with all genders and PwD • Show how to operate digital devices and use the associated applications and features, safely and securely

	<ul style="list-style-type: none">• Explain the significance of identifying customer needs and addressing them• Create a biodata• Use various sources to search and apply for jobs• Discuss the significance of dressing up neatly and maintaining hygiene for an interview• Describe opportunities as an entrepreneur
Classroom Aids:	
Computer, projector, printer, student table, whiteboard/flip chart, marker, duster	
Tools, Equipment and Other Requirements	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
CLASS VIII		3	2	1		

Trainer Certification	
Domain Certification	Platform Certification
<p>Certified for Job Role: Crawler Crane Operator Mapped to QP: IES/Q110 Version2.0. Minimum accepted score 70%.</p>	<p>Certified for Job Role: Crawler Crane Operator Minimum accepted score 70%.</p>

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
CLASS VIII		3	2	1		

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: Crawler Crane Operator Mapped to QP: IES/Q1101–Version2.0 Minimum accepted score 70%.	Certified for Job Role: Crawler Crane Operator Minimum accepted score 70%.

Assessment Strategy

Criteria for assessment for Qualification Pack have been laid down based on the NOS's.

Each Performance Criteria (PC) has been assigned marks proportional to its importance within NOS and weightages have also been given among the NOSs accordingly.

The assessment of the theory/knowledge will be based on written test/viva or both while skill test shall be hands on practical.

Behavior and attitude will be assessed while performing the assigned task.

The assessment shall be done as per the guidelines formulated by IESC.

The assessment agencies in consultation with IESC will create unique question papers for theory/knowledge and practical skills at each IESC accredited testing centers (as per assessment criteria below)

To pass the Qualification Pack, every trainee should score a minimum of 70%.

In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification pack.

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective, psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
QRC	Qualification Review Committee
SSC	Sector Skill Council
SDMS	Skill Development Management System
SIP	Skill India Portal
HSE	Health Safety Environment
PPE	Personal Protective Equipment
PwD	Persons with disabilities