

# QUALIFICATION PACK – OCCUPATIONAL STANDARD FOR INFRASTRUCTURE EQUIPMENT INDUSTRY

## What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding



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## Introduction

### Qualification Pack - Excavator Operator

<b>SECTOR:</b>	INFRASTRUCTURE EQUIPMENT
<b>SUB SECTOR:</b>	Equipment Operations
<b>OCCUPATION:</b>	Operator
<b>REFERENCE ID:</b>	IES/Q0103
<b>ALIGNED TO:</b>	NCO-2004/ 8332.2

**Brief Job Description:**An excavator operator drives and controls the excavator operations; the movement and angle of the arm and the equipment. He determines the angle and speed of the movements of the arm and bucket along the vertical axis.

**Personal Attributes:**This job requires the individual to be extremely careful and diligent and have high level of concentration. Hard work and strong work ethics, courteous behavior with co – workers are equally desirable. He should also be physically agile, strong, have good eye sight and not suffer from colour-blindness.

## Qualification Pack For Excavator Operator

Job Details

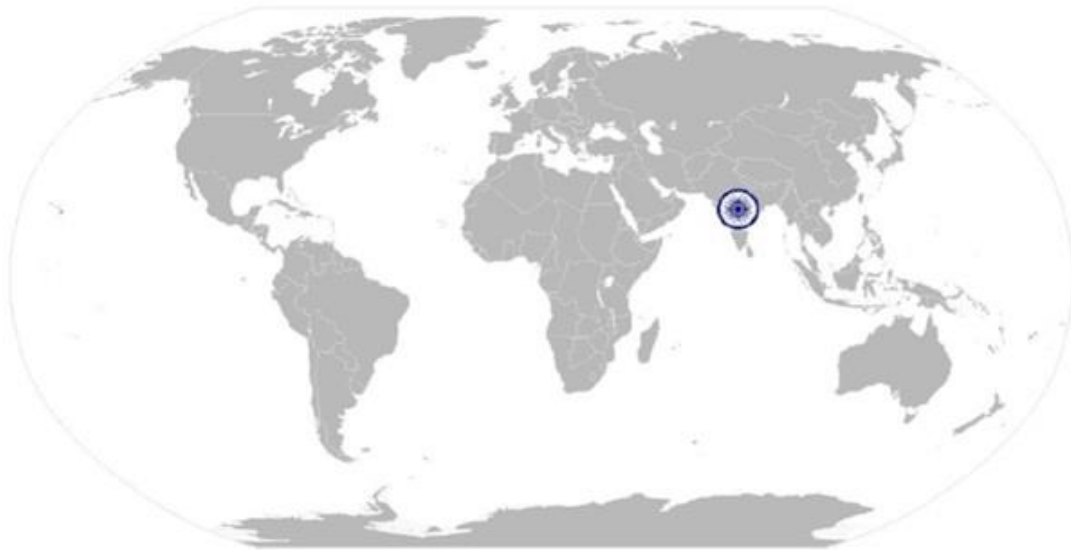
<b>Qualifications Pack Code</b>	<b>IES/Q0103</b>		
<b>Job Role</b>	<b>Excavator Operator</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Sector</b>	<b>Infrastructure Equipment</b>	<b>Drafted on</b>	<b>16/02/15</b>
<b>Sub-sector</b>	<b>Equipment Operations</b>	<b>Last reviewed on</b>	<b>31/03/15</b>
<b>Occupation</b>	<b>Operator</b>	<b>Next review date</b>	<b>31/03/17</b>
<b>NSQC clearance on</b>	<b>31/03/15</b>		

<b>Job Role</b>	<b>Excavator Operator</b>
<b>Role Description</b>	Drives and controls an excavating machine which is a self – propelled machine used to dig and dump above the base level of the machine
<b>NSQF level</b>	4
<b>Minimum Educational Qualifications*</b>	Preferably Class VIII
<b>Maximum Educational Qualifications*</b>	NA
<b>Training</b> (Suggested but not mandatory)	Training in excavator handling preferred. Must have a valid Heavy Commercial Vehicle Driving License (HCV)
<b>Minimum Job Entry Age</b>	Preferably 18 years
<b>Experience</b>	In lieu of minimum qualification, the incumbent should have 2 years of experience in driving excavator.
<b>Applicable National Occupational Standards (NOS)</b>	<p><b>Compulsory</b></p> <ol style="list-style-type: none"> <li>1. <a href="#">IES/N0107</a> Carry out pre-operation checks on an excavator</li> <li>2. <a href="#">IES/N0108</a> Operate an excavator</li> <li>3. <a href="#">IES/N0109</a> Perform routine maintenance and troubleshooting of a excavator</li> <li>4. <a href="#">IES/N7601</a> Comply with worksite health and safety guidelines</li> </ol> <p><b>Optional:</b> N.A.</p>
<b>Performance Criteria</b>	As described in the relevant OS units

Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
Sub-functions	Sub-functions are sub-activities essential to fulfil achieving the objectives of the function.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding; he/she needs to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Qualifications Pack(QP)	Qualifications Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Unit Code	Unit Code is a unique identifier for an Occupational Standard, which is denoted by an 'N'.
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to find the required one.
Scope	Scope is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of required performance.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform up to the required standard.

Keywords /Terms	Description
OS	Occupational Standard(s)
NOS	National Occupational Standard(s)
QP	Qualifications Pack
NSQF	National Skill Qualifications Framework
ITI	Industrial Training Institute
HCV	Heavy Commercial Vehicle
SHE	Safety Health and Environment
SOP	Standard Operating Procedure
TBD	To Be Determined

# National Occupational Standard



## Overview

This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that need to be carried out to prepare the excavator for a shift

## Carry out pre-operation checks on an excavator

<b>Unit Code</b>	<b>IES/N0107</b>
<b>Unit Title (Task)</b>	<b>Carry out pre-operation checks on an excavator</b>
<b>Description</b>	This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that need to be carried out to prepare the excavator for a shift
<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>• Pre-operation checks</li> <li>• Documentation and Reporting</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Pre Operation Checks</b>	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. Adhere to time limits given by supervisor</p> <p>PC2. Ensure that turret and undercarriage are free of cracks and wear</p> <p>PC3. Confirm that the track &amp; sprockets - for wear or cracked teeth</p> <p>PC4. Ensure that the boom and the stick are free of dents and cracked welds</p> <p>PC5. Confirm that the forks is without bends</p> <p>PC6. Make sure that oil levels of engine, transmission, radiant coolant and brake are as per manufacturer's indicators</p> <p>PC7. Check differential and hydraulic oil levels</p> <p>PC8. Check the hydraulic hose and ram for leakages</p> <p>PC9. Conduct checks to ensure proper condition of parking brake, main horn, reverse horn and head light</p> <p>PC10. Check fan belt tension, electrolyte level and terminal tightness</p> <p>PC11. Conduct visual inspection to check the various controls, gauges, warning lamp and ensure that all safety and maintenance decals are available</p> <p>PC12. Check load chart is displayed in cabin</p> <p>PC13. Check and adjust driving position, rear and side mirrors, seat belts and set them as per comfort level</p> <p>PC14. Check the circle turn gear and clean if required</p> <p>PC15. Ensure air filter dust bowls are clean and check the gasket and inner filter</p> <p>PC16. Check and ensure that all cabin controls including electronic display are functioning properly</p> <p>PC17. Get water and sediments drained from the fuel tank</p> <p>PC18. Ensure coolant and oil in engine, transmission, etc. is topped up, if necessary as per manufacturer's indicators</p> <p>PC19. Ensure that all greasing pins and pivots points are appropriately greased</p> <p>PC20. Examine the compressor unit and all fittings and air lines</p> <p>PC21. Check clearance of the drawbar ball and socket, look for excessive free-play, and adjust if necessary</p> <p>PC22. Ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)</p> <p>PC23. Keep footplates and steps clean and free from mud, dirt and oil</p> <p>PC24. Certify that no one is under or on the machine, before operating</p>
<b>Documentation and</b>	PC25. Maintain a checking/maintenance logbook to record all activities

## Carry out pre-operation checks on an excavator

<b>Reporting</b>	<p>performed before starting the excavator</p> <p>PC26. Report defects precisely to the supervisor if beyond scope of his role</p>
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. The organization's procedures and guidelines related to Breakdown &amp; Maintenance services</p> <p>KA2. The performance standards &amp; procedures followed in the company</p> <p>KA3. Reporting structure in the company</p> <p>KA4. Escalation matrix for reporting unresolved problems</p> <p>KA5. Timeframe in which the complaint/problem should be resolved</p> <p>KA6. Work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process</p> <p>KA7. Location of tools</p> <p>KA8. Contact person in case of queries on procedure or products</p> <p>KA9. Location and process for storage and disposal of waste material</p> <p>KA10. Safety Policy of the company</p>
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Different types of excavators and their use and function</p> <p>KB2. Introduction to engine, transmission, their use and function</p> <p>KB3. Different types of hydraulic mechanisms</p> <p>KB4. Principles of friction</p> <p>KB5. Steering mechanisms and correct way of steering on slopes</p> <p>KB6. Significance of greasing and oiling parts of excavator that need routine lubrication</p> <p>KB7. Instrument panel / cabin controls, their location and operation</p> <p>KB8. Controls, levers and switches in order to operate the excavator properly</p> <p>KB9. Optimal working condition of Excavator components e.g. hoist, propel system, power train, hoist, boom &amp; stick and other attachments</p> <p>KB10. Optimal engine oil pressure, radiator coolant temperature</p> <p>KB11. Visual checks to identify damage, defects, cracks or leaks beforehand</p>
<b>Skills (S)</b>	
<b>A. Core Skills / Generic Skills</b>	<b>Writing Skills</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. Record any deviations/ incidents as per prescribed norms</p>
	<b>Reading Skills</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA2. Read and comprehend basic English to read manuals of operations</p> <p>SA3. Read instructions, guidelines/procedures/rules related to the worksite and equipment operations</p>
	<b>Oral Communication (Listening and Speaking Skills)</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA4. Give clear instructions to co-workers, subordinates and other personnel</p> <p>SA5. Use correct technical terms while interacting with supervisor</p>
<b>B. Professional Skills</b>	<b>Decision Making</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SB1. Decide when to conduct maintenance checks</p>

## Carry out pre-operation checks on an excavator

	<b>Plan and Organize</b>
	The user/ individual on the job needs to know and understand how to: SB2. Work with supervisors/ team mates to carry out work related tasks SB3. Plan work according to the required schedule and location SB4. Plan for cleaning and lubricating the <appropriate equipment> every day
	<b>Customer Centricity</b>
	The user/ individual on the job needs to know and understand how to: SB5. Provide service of the highest order to ensure customer satisfaction
	<b>Problem Solving</b>
	The user/ individual on the job needs to know and understand how to: SB6. Identify immediate or temporary solutions to resolve mechanical issues SB7. Judge when to seek assistance from supervisor
	<b>Analytical Thinking</b>
	The user/ individual on the job needs to know and understand how to: SB8. Identify cause and effect relations in his area of work
<b>Critical Thinking</b>	
The user/ individual on the job needs to know and understand how to: SB9. Analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently	

## NOS Version Control

<b>NOS Code</b>	IES/N0107		
<b>Credits(NSQF)</b>	TBD	<b>Version number</b>	1.0
<b>Sector</b>	Infrastructure Equipment	<b>Drafted on</b>	16/02/15
<b>Industry Sub-sector</b>	Equipment Operations	<b>Last reviewed on</b>	31/03/15
<b>Occupation</b>	Operator	<b>Next review date</b>	31/03/15

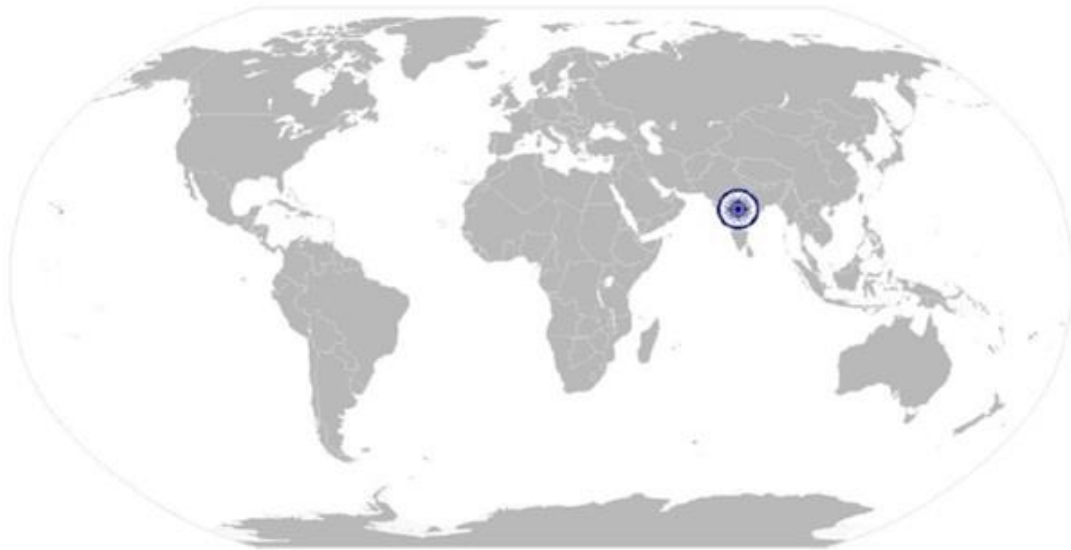
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## Operate an excavator

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# National Occupational Standard



### Overview

This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that are required for operating an excavator.

## Operate an excavator

<b>Unit Code</b>	IES/N0108
<b>Unit Title (Task)</b>	Operate an excavator
<b>Description</b>	This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that are required for operating an excavator.
<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>• Excavator operations</li> <li>• Load hauling and loading</li> <li>• Load dumping</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Excavator operations</b>	To be competent, the user/individual on the job must be able to: PC1. Plan and organize the job according to given instructions PC2. Inspect the worksite to identify and loose soil, hidden deep trenches or marshy patches where excavator could get stuck PC3. Start the engine using ignition switch PC4. Use the priming pump and pre-heater to start the engine in cold weather conditions PC5. Identify and select the appropriate attachment to be used for performing the task at a work site PC6. Use the emergency stop button to disable all power to the excavator in case of a crisis, as per operator manual
<b>Load hauling and loading</b>	PC7. Operate the shifting quadrant device for selecting the correct gear range PC8. Ensure excavator load and operating speed is within limits specified by the manufacturer PC9. Look out for people working and hazards such as trenches, potholes and cables PC10. Adhere to time limits given by the supervisors PC11. Perform in-operation visual checks on critical temperature and pressure gauges PC12. Select and use the right type of brake in different situations and conditions PC13. Ensure that walkway rules e.g. operating the excavator within the permissible/ allocated areas are followed PC14. Utilize judiciously various signaling devices available in the excavator as such as turn signal, parking indicator, air horn etc. PC15. Keep a safe distance from a tip edge and use an approved stop block before tipping over an edge PC16. Keep a safe distance from other plant or vehicles PC17. Judge the grade of the excavator travel limitation and operate accordingly
<b>Load Dumping</b>	PC18. Ensure that excavator is always parked on firm, level ground; with handbrake applied and drive and controls disengaged PC19. Operate the body hoist control handle to maneuver the hydraulic ram that tips the dump

## Operate an excavator

	<p>PC20. Discharge the load safely at the position and in the manner designated by the supervisor</p> <p>PC21. Ensure that no other operators travel on or stand near the Excavator</p> <p>PC22. Inform supervisor of any problems while operating the Excavator</p>
<b>Knowledge and Understanding (K)</b>	
<p><b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. The organization's procedures and guidelines related to Breakdown &amp; Maintenance services</p> <p>KA2. The performance standards &amp; procedures followed in the company</p> <p>KA3. Reporting structure in the company</p> <p>KA4. Escalation matrix for reporting unresolved problems</p> <p>KA5. Timeframe in which the complaint/problem should be resolved</p> <p>KA6. Work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process</p> <p>KA7. Location of tools</p> <p>KA8. Contact person in case of queries on procedure or products</p> <p>KA9. Location and process for storage and disposal of waste material</p> <p>KA10. Safety Policy of the company</p>
<p><b>B. Technical Knowledge</b></p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. Different types of excavators and their specific use</p> <p>KB2. Appropriate usage of various attachments such as</p> <ul style="list-style-type: none"> <li>• excavation bucket</li> <li>• extreme excavation bucket</li> <li>• skeleton bucket</li> <li>• ditch cleaning bucket</li> <li>• tiltable ditch cleaning bucket</li> <li>• trapezoidal bucket, quick couplers</li> <li>• pin grabber plus quick coupler</li> <li>• hammers</li> <li>• rock breaker</li> <li>• contractor's grapples</li> <li>• demolition and sorting grapples</li> <li>• and orange peel grapples etc</li> </ul> <p>KB3. Distinguish between different types of attachments</p> <p>KB4. Introduction to engine, transmission, their use and function</p> <p>KB5. Different types of hydraulic mechanisms</p> <p>KB6. Principles of friction</p> <p>KB7. Steering mechanisms and correct way of steering on slopes</p> <p>KB8. Significance of greasing and oiling, parts if Excavator that need routine lubrication / daily maintenance activity which is mandatory</p> <p>KB9. Instruments panel, their location and operation</p> <p>KB10. Controls, levers and switches in order to operate the excavator properly</p> <p>KB11. Optimal working condition of Excavator components e.g. hoist, propel system, power train and other attachments</p> <p>KB12. Optimal engine oil pressure, radiator coolant temperature</p> <p>KB13. Visual checks to identify damage, defects or leaks beforehand</p>

## Operate an excavator

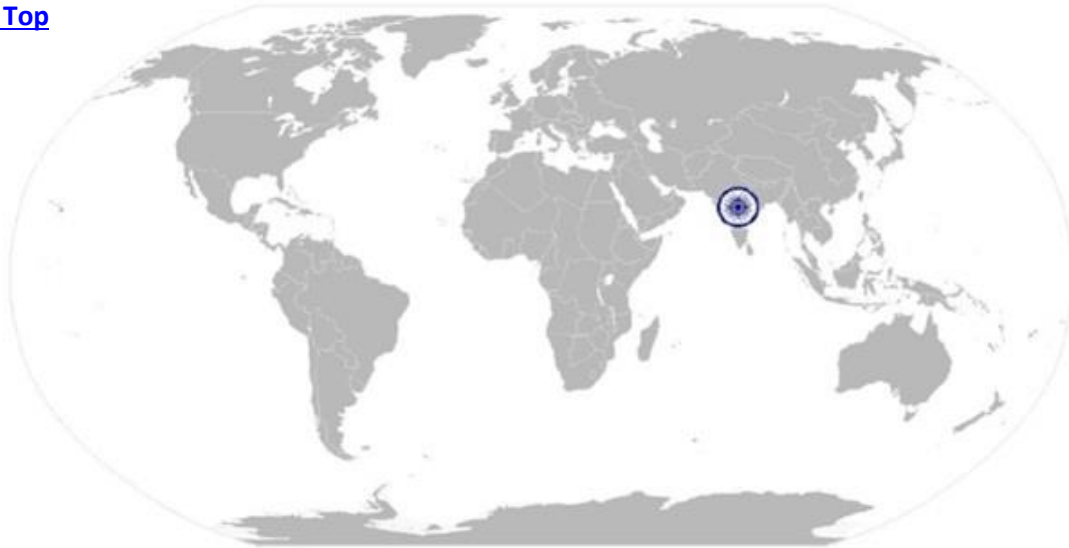
	<p>KB14. General safety rules vis-à-vis digging and stacking</p> <p>KB15. Dangers of digging in vicinity of misfired shots</p> <p>KB16. All safety signs and other emergency signals</p> <p>KB17. Correct maintenance procedures for excavator</p> <p>KB18. The location and procedure of using the emergency stop button</p> <p>KB19. Response to emergencies e.g. correct way to use fire extinguisher</p>
<b>Skills (S)</b>	
<b>A. Core Skills / Generic Skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to: SA1. Record any deviations/ incidents as per prescribed norms
	<b>Reading Skills</b>
	The user/ individual on the job needs to know and understand how to: SA2. Read and comprehend basic English to read manuals of operations SA3. Interpret stakes and signage on the road and during worksite operations SA4. Read instructions, guidelines/procedures/rules related to the worksite and equipment operations
	<b>Oral Communication (Listening and Speaking Skills)</b>
	The user/ individual on the job needs to know and understand how to: SA5. Give clear instructions to co-workers, subordinates and other personnel SA6. Use correct technical terms while interacting with supervisor
<b>B. Professional Skills</b>	<b>Decision Making</b>
	The user/ individual on the job needs to know and understand how to: SB1. Assess for any damage/faulty component in the excavator and take action accordingly SB2. Decide when to perform appropriate driving operations i.e forward, reverse, 'U' turn, tight spot
	<b>Plan and Organize</b>
	The user/ individual on the job needs to know and understand how to: SB3. Work with supervisors/ team mates to carry out work related tasks SB4. Plan work according to the required schedule and location
	<b>Customer Centricity</b>
	The user/ individual on the job needs to know and understand how to: SB5. Provide service of the highest order to ensure customer satisfaction
	<b>Problem Solving</b>
	The user/ individual on the job needs to know and understand how to: SB6. Identify immediate or temporary solutions to resolve mechanical issues SB7. Judge when to seek assistance from supervisor
	<b>Analytical Thinking</b>
	The user/ individual on the job needs to know and understand how to: SB8. Identify possible ways to improve operational efficiency SB9. Suggest methods to avoid accidents/errors while operating machine
<b>Critical Thinking</b>	
	The user/ individual on the job needs to know and understand how to: SB10. Analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

## Operate an excavator

### NOS Version Control

<b>NOS Code</b>	<b>IES/N0108</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Sector</b>	<b>Infrastructure Equipment</b>	<b>Drafted on</b>	<b>16/02/15</b>
<b>Industry Sub-sector</b>	<b>Equipment Operations</b>	<b>Last reviewed on</b>	<b>31/03/15</b>
<b>Occupation</b>	<b>Operator</b>	<b>Next review date</b>	<b>31/03/15</b>

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## Perform routine maintenance and troubleshooting of a excavator

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# National Occupational Standard



### Overview

This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that are required for performing routine maintenance and troubleshooting on the excavator.

## Perform routine maintenance and troubleshooting of a excavator

National Occupational Standard

<b>Unit Code</b>	<b>IES/N0109</b>
<b>Unit Title (Task)</b>	<b>Perform routine maintenance and troubleshooting of a excavator</b>
<b>Description</b>	This unit provides Performance Criteria, Knowledge & Understanding and Skills & Ability for activities that are required for performing routine maintenance and troubleshooting on the excavator.
<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>• Routine maintenance</li> <li>• Basic diagnostics and troubleshooting</li> <li>• Documentation and Reporting</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Routine maintenance</b>	To be competent, the user/individual on the job must be able to: <p>PC1. Assess the right service schedule by tracking machine operating hours</p> <p>PC2. Clean air filter dust bowls at regular intervals</p> <p>PC3. Clean footplates, pedals and steps free from mud, dirt, ice and snow at regular intervals</p> <p>PC4. Drain water and sediment/ fuel separators everyday</p> <p>PC5. Replenish coolants, lubricants and fluids everyday</p> <p>PC6. Grease all greasing pins and pivot points everyday</p> <p>PC7. Check battery levels and condition of the terminals and carry out minor adjustments if required</p> <p>PC8. Check and maintain the tyre rims, air pressure, wheel nuts and treads as per manufacturer's indicators</p>
<b>Basic diagnostics and troubleshooting</b>	To be competent, the user/individual on the job must be able to: <p>PC9. Ensure the machine is on firm and level ground before attempting to carry out any maintenance; track machine operating hours to assess the right service schedule</p> <p>PC10. Complete timely and legibly daily/ weekly maintenance sheets as provided by the company</p> <p>PC11. Ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)</p> <p>PC12. Ensure that suitable props/ support devices are used and the bucket is not raised while performing maintenance</p> <p>PC13. Ensure that no maintenance task on the engine is performed when running or still hot</p> <p>PC14. Assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel</p> <p>PC15. Diagnose the problem</p> <p>PC16. Handle and dispose waste based on environmental guidelines at the work place</p>
<b>Documentation and Reporting</b>	PC17. Follow reporting procedures as laid down by the employer PC18. Complete all documentation in the prescribed standards in a timely manner PC19. Report and escalate problems/ incidents as required in a timely manner

## Perform routine maintenance and troubleshooting of a excavator

	PC20. Report defects precisely to the supervisor if beyond scope of his role
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. The organization's procedures and guidelines related to Breakdown &amp; Maintenance services</p> <p>KA2. The performance standards &amp; procedures followed in the company</p> <p>KA3. Reporting structure in the company</p> <p>KA4. Escalation matrix for reporting unresolved problems</p> <p>KA5. Timeframe in which the complaint/problem should be resolved</p> <p>KA6. Work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process</p> <p>KA7. Location of tools</p> <p>KA8. Contact person in case of queries on procedure or products</p> <p>KA9. Location and process for storage and disposal of waste material</p> <p>KA10. Safety Policy of the company</p>
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. The organization's procedures and guidelines related to Breakdown &amp; Maintenance services</p> <p>KB2. The performance standards &amp; procedures followed in the company</p> <p>KB3. Reporting structure in the company</p> <p>KB4. Escalation matrix for reporting unresolved problems</p> <p>KB5. Timeframe in which the complaint/problem should be resolved</p> <p>KB6. Work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process</p> <p>KB7. Location of tools</p> <p>KB8. Contact person in case of queries on procedure or products</p> <p>KB9. Location and process for storage and disposal of waste material</p> <p>KB10. Safety Policy of the company</p>
<b>Skills (S)</b>	
<b>A. Core Skills / Generic Skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to: SA1. Record any deviations/ incidents as per prescribed norms
	<b>Reading Skills</b>
	The user/ individual on the job needs to know and understand how to: SA2. Read and comprehend basic English to read manuals of operations SA3. Read instructions, guidelines/procedures/rules related to the worksite and equipment operations
	<b>Oral Communication (Listening and Speaking Skills)</b>
	The user/ individual on the job needs to know and understand how to: SA4. Give clear instructions to co-workers, subordinates and other personnel SA5. Use correct technical terms while interacting with supervisor
<b>B. Professional Skills</b>	<b>Decision Making</b>
	The user/ individual on the job needs to know and understand how to: SB1. Decide when to conduct maintenance checks SB2. Evaluate the decision and conduct basic trouble shooting
	<b>Plan and Organize</b>



## Perform routine maintenance and troubleshooting of a excavator

	The user/ individual on the job needs to know and understand how to: SB3. Work with supervisors/ team mates to carry out work related tasks SB4. Plan work according to the required schedule and location SB5. Plan for regular maintenance on a daily basis before machine operations
	<b>Customer Centricity</b>
	The user/ individual on the job needs to know and understand how to: SB6. Provide service of the highest order to ensure customer satisfaction
	<b>Problem Solving</b>
	The user/ individual on the job needs to know and understand how to: SB7. Identify immediate or temporary solutions to resolve mechanical issues SB8. Judge when to seek assistance from supervisor
	<b>Analytical Thinking</b>
	The user/ individual on the job needs to know and understand how to: SB9. Identify possible ways to improve operational efficiency SB10. Check for damages and diagnose common problems in the excavator and take relevant action
	<b>Critical Thinking</b>
The user/ individual on the job needs to know and understand how to: SB11. Analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently	

## NOS Version Control

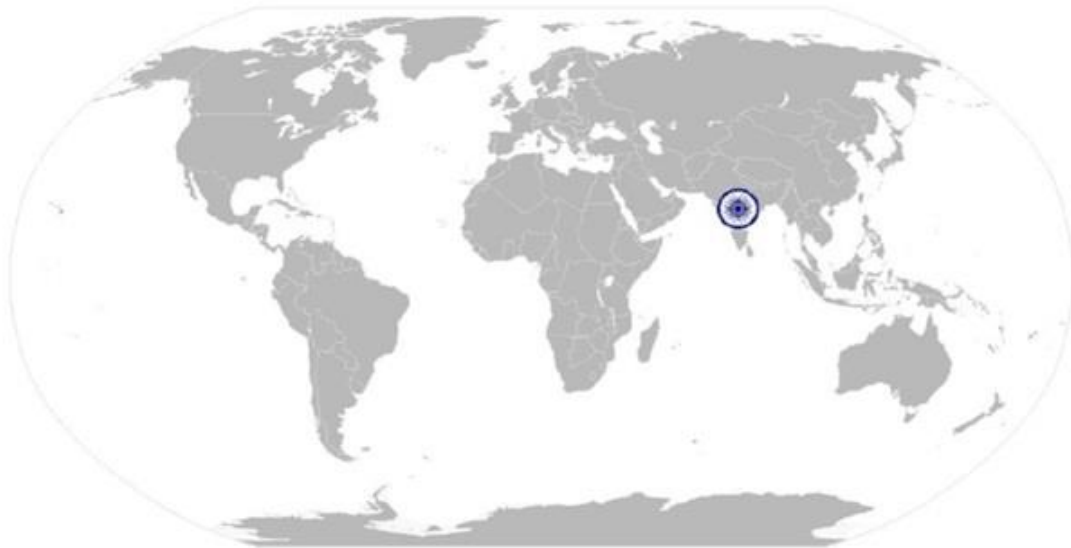
<b>NOS Code</b>	<b>IES/N0109</b>		
<b>Credits(NSQF)</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Sector</b>	<b>Infrastructure Equipment</b>	<b>Drafted on</b>	<b>16/02/15</b>
<b>Industry Sub-sector</b>	<b>Equipment Operations</b>	<b>Last reviewed on</b>	<b>31/03/15</b>
<b>Occupation</b>	<b>Operator</b>	<b>Next review date</b>	<b>31/03/15</b>

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Comply with worksite health and safety guidelines

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# National Occupational Standard



## Overview

This unit is about adhering to health and safety requirements at the worksite during equipment operations.

## Comply with worksite health and safety guidelines

<b>Unit Code</b>	IES/N7601
<b>Unit Title (Task)</b>	Comply with worksite health and safety guidelines
<b>Description</b>	This unit is about adhering to health and safety requirements at the worksite during equipment operations.
<b>Scope</b>	This unit/task covers the following: <ul style="list-style-type: none"> <li>worksite health and safety</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Worksite health and safety</b>	To be competent, the user/individual on the job must be able to: <p>PC1. Comply with safety, health, security and environment related regulations/ guidelines at the work site</p> <p>PC2. Use Personal Protective Equipment (PPE) and other safety gear such as seat belt, body protection, respiratory protection, eye protection, ear protection and hand protection</p> <p>PC3. Follow safety measures during operations to ensure that the health and safety of self or others (including members of the public) is not at risk</p> <p>PC4. Carry out operations as per the manufacturer's and worksite related health and safety guidelines</p> <p>PC5. Handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines</p> <p>PC6. Follow safety regulations and procedures with regard to worksite hazards and risks</p> <p>PC7. Operate various grades of fire extinguishers, as applicable</p> <p>PC8. Support in administering basic first aid and report to concerned team members, as required, in case of an accident</p> <p>PC9. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility</p> <p>PC10. Record and report details related to operations, incidents or accidents, as applicable</p>
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: <p>KA1. Health, safety, environmental(HSE) and security related policies/ guidelines of the organization and the worksite</p> <p>KA2. The importance of complying with health, safety, environmental and security guidelines at the worksite and during operations</p> <p>KA3. Contact details of personnel responsible for Health, Safety and environment (HSE) related matters</p> <p>KA4. Location of worksite storage, SHE team and safe assembly points</p> <p>KA5. Concerned personnel to reach out in case of emergencies and accidents/ incidents</p> <p>KA6. Reporting and documentation procedures for HSE and security matters</p>
<b>B. Technical Knowledge</b>	The user/individual on the job needs to know and understand: <p>KB1. Manufacturer's guidelines related to health and safety requirements</p>

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	<p>KB2. Common types of health, safety, environment and security risks related to the worksite and operations</p> <p>KB3. Types, use and importance of Personal Protective Equipment (PPE) and other safety gear</p> <p>KB4. Safe working practices to avoid common hazards and risks</p> <p>KB5. Guidelines for transport, storage and disposal of hazardous materials and waste</p> <p>KB6. Types of common hazards and risks at the worksite including fire, electrical, gas emergencies, accidents, incidents, structure collapse, machine breakdown</p> <p>KB7. Knowledge of safe lockdown/ stop of machinery use in case of emergencies and incidents/ accidents</p> <p>KB8. Types of fire extinguishers and their use</p> <p>KB9. Common injuries and appropriate basic first aid treatment eg. electrical shock, bleeding, wounds, fractures, minor burns, eye injuries</p>
<b>Skills (S)</b>	
<b>A. Core Skills / Generic Skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to: SA1. Document and report any health and safety related incidents/ accidents
	<b>Reading Skills</b>
	The user/ individual on the job needs to know and understand how to: SA2. Read and comprehend basic English to read manuals of operations SA3. Read all organizational and equipment related health and safety manuals and documents SA4. Read instructions, guidelines/procedures/rules related to the worksite and equipment operations
	<b>Oral Communication (Listening and Speaking Skills)</b>
	The user/ individual on the job needs to know and understand how to: SA5. Give clear instructions to co-workers, subordinates and other personnel SA6. Use correct technical terms while interacting with supervisor
<b>B. Professional Skills</b>	<b>Decision Making</b>
	The user/ individual on the job needs to know and understand how to: SB1. Make an appropriate timely decision in responding to emergencies/accidents in line with organizational/ worksite guidelines SB2. Use correct PPE and other safety gear while at the worksite
	<b>Plan and Organize</b>
	The user/ individual on the job needs to know and understand how to: SB3. Work with supervisors/ team mates to carry out work related tasks SB4. Plan work according to the required schedule and location
	<b>Customer Centricity</b>
	The user/ individual on the job needs to know and understand how to: SB5. Build and maintain positive and effective relationships with colleagues and customers
<b>Problem Solving</b>	
The user/ individual on the job needs to know and understand how to:	

## Comply with worksite health and safety guidelines

	SB6. Seek appropriate assistance from other sources to resolve problems
	<b>Analytical Thinking</b>
	The user/ individual on the job needs to know and understand how to: SB7. Assess the intensity of the fire accident and operate fire extinguishers
	<b>Critical Thinking</b>
	The user/ individual on the job needs to know and understand how to: SB8. Analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

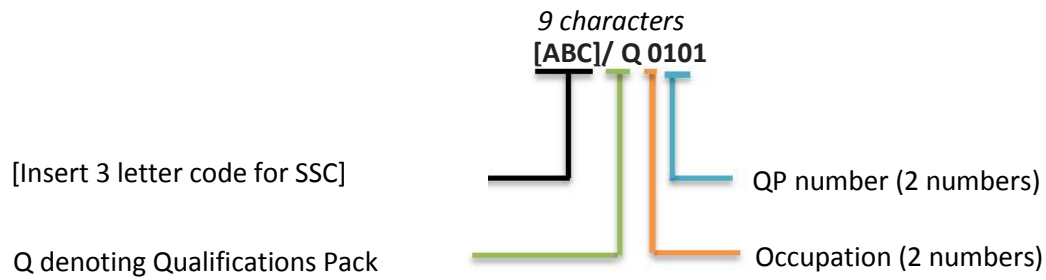
## NOS Version Control

NOS Code	IES/N7601		
Credits(NSQF)	TBD	Version number	1.0
Sector	INFRASTRUCTURE EQUIPMENT	Drafted on	16/02/15
Industry Sub-sector	Equipment Operations	Last reviewed on	31/03/15
Occupation	Operator	Next review date	31/03/15

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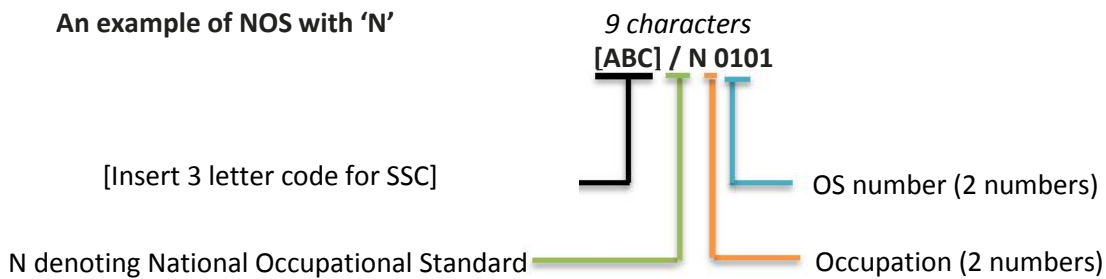
*Nomenclature for QP and NOS units*

### Qualifications Pack



### Occupational Standard

An example of NOS with 'N'



*Nomenclature for QP and NOS units*

The following acronyms/codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Equipment Operations	1 to 10
Equipment Service and spares	11 to 20
Equipment Production	21 to 40
Equipment Sales	41 to 50
Equipment Financing	51 to 55
Core Enablers	56 to 65
Other Enablers	66 to 75
Common Occupations	76 to 85

Sequence	Description	Example
Three letters	Industry name	IES
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

## CRITERIA FOR ASSESSMENT OF TRAINEES

**Job Role** Excavator Operator

**Qualification Pack** IES/Q0103

**Sector Skill Council** Infrastructure & Equipment

### Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5. To pass the Qualification Pack, every trainee should score a minimum of 70% aggregate
6. 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

NOS	Performance Criteria	Marks Allocation			
		Total Mark	Out Of	Theory	Practical
IES/N0107 Carry out pre-operation checks on an excavator	PC1. Adhere to time limits given by supervisor	70	2	1	1
	PC2. Ensure that turret and undercarriage are free of cracks and wear		3	0	3
	PC3. Confirm that the track & sprockets - for wear or cracked teeth		3	1	2
	PC4. Ensure that the boom and the stick are free of dents and cracked welds		3	0	3
	PC5. Confirm that the forks is without bends		3	0	3
	PC6. Make sure that oil levels of engine, transmission, radiant coolant and brake are as per manufacturer's indicators		3	1	2
	PC7. Check differential and hydraulic oil levels		3	0	3
	PC8. Check the hydraulic hose and ram for leakages		2	0	2
	PC9. Conduct checks to ensure proper condition of parking brake, main horn, reverse horn and head light		4	1	3



	PC10. Check fan belt tension, electrolyte level and terminal tightness		2	0	2
	PC11. Conduct visual inspection to check the various controls, gauges, warning lamp and ensure that all safety and maintenance decals are available		3	1	2
	PC12. Check load chart is displayed in cabin		2	0	2
	PC13. Check and adjust driving position, rear and side mirrors, seat belts and set them as per comfort level		3	0	3
	PC14. Check the circle turn gear and clean if required		2	0	2
	PC15. Ensure air filter dust bowls are clean and check the gasket and inner filter		4	1	3
	PC16. Check and ensure that all cabin controls including electronic display are functioning properly		3	0	3
	PC17. Get water and sediments drained from the fuel tank		1	0	1
	PC18. Ensure coolant and oil in engine, transmission, etc. is topped up, if necessary as per manufacturer's indicators		2	0	2
	PC19. Ensure that all greasing pins and pivots points are appropriately greased		3	0	3
	PC20. Examine the compressor unit and all fittings and air lines		4	1	3
	PC21. Check clearance of the drawbar ball and socket, look for excessive free play, and adjust if necessary		2	0	2
	PC22. Ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)		4	1	3
	PC23. Keep footplates and steps clean and free from mud, dirt and oil		3	1	2
	PC24. Certify that no one is under or on the machine, before operating		2	0	2
	PC25. Maintain a checking/maintenance logbook to record all activities performed before starting the excavator		3	1	2
	PC26. Report defects precisely to the supervisor if beyond scope of his role		1	0	1
		Total	70	10	60
IES/N0108 Operate an	PC1. Plan and organize the job according to given instructions	60	2	0	2

excavator	PC2. Inspect the worksite to identify and loose soil, hidden deep trenches or marshy patches where excavator could get stuck	3	0	3
	PC3. Start the engine using ignition switch	3	0	3
	PC4. Use the priming pump and pre-heater to start the engine in cold weather conditions	3	0	3
	PC5. Identify and select the appropriate attachment to be used for performing the task at a work site	4	1	3
	PC6. Use the emergency stop button to disable all power to the excavator in case of a crisis, as per operator manual	2	0	2
	PC7. Operate the shifting quadrant device for selecting the correct gear range	4	1	3
	PC8. Ensure excavator load and operating speed is within limits specified by the manufacturer	4	1	3
	PC9. Look out for people working and hazards such as trenches, potholes and cables	2	0	2
	PC10. Adhere to time limits given by the supervisors	2	0	2
	PC11. Perform in-operation visual checks on critical temperature and pressure gauges	3	0	3
	PC12. Select and use the right type of brake in different situations and conditions	4	1	3
	PC13. Ensure that walkway rules e.g. operating the excavator within the permissible/ allocated areas are followed	2	0	2
	PC14. Utilize judiciously various signaling devices available in the excavator as such as turn signal, parking indicator, air horn etc.	2	0	2
	PC15. Keep a safe distance from a tip edge and use an approved stop block before tipping over an edge	3	1	2
	PC16. Keep a safe distance from other plant or vehicles	2	0	2
	PC17. Judge the grade of the excavator travel limitation and operate accordingly	2	0	2
	PC18. Ensure that excavator is always parked on firm, level ground; with handbrake applied and drive and controls disengaged	3	1	2
	PC19. Operate the body hoist control handle to maneuver the hydraulic ram that tips the dump	3	0	3

	PC20. Discharge the load safely at the position and in the manner designated by the supervisor		3	0	3
	PC21. Ensure that no other operators travel on or stand near the Excavator		2	0	2
	PC22. Inform supervisor of any problems while operating the Excavator		2	0	2
		Total	60	6	54
IES/N0109 Perform routine maintenance and troubleshooting of a excavator	PC1. Assess the right service schedule by tracking machine operating hours	55	3	0	3
	PC2. Clean air filter dust bowls at regular intervals		4	1	3
	PC3. Clean footplates, pedals and steps free from mud, dirt, ice and snow at regular intervals		3	0	3
	PC4. Drain water and sediment/ fuel separators everyday		3	1	2
	PC5. Replenish coolants, lubricants and fluids everyday		3	0	3
	PC6. Grease all greasing pins and pivot points everyday		3	0	3
	PC7. Check battery levels and condition of the terminals and carry out minor adjustments if required		2	0	2
	PC8. Check and maintain the tyre rims, air pressure, wheel nuts and treads as per manufacturer's indicators		4	1	3
	PC9. Ensure the machine is on firm and level ground before attempting to carry out any maintenance; track machine operating hours to assess the right service schedule		4	1	3
	PC10. Complete timely and legibly daily/ weekly maintenance sheets as provided by the company		2	0	2
	PC11. Ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)		3	0	3
	PC12. Ensure that suitable props/ support devices are used and the bucket is not raised while performing maintenance		4	1	3
	PC13. Ensure that no maintenance task on the engine is performed when running or still hot		2	0	2
	PC14. Assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel		2	0	2

	PC15. Diagnose the problem		2	0	2
	PC16. Handle and dispose waste based on environmental guidelines at the work place		3	0	3
	PC17. Follow reporting procedures as laid down by the employer		2	0	2
	PC18. Complete all documentation in the prescribed standards in a timely manner		2	0	2
	PC19. Report and escalate problems/ incidents as required in a timely manner		2	0	2
	PC20. Report defects precisely to the supervisor if beyond scope of his role		2	0	2
		Total	55	5	50
IES/N7601 Comply with worksite health and safety guidelines	PC1. Comply with safety, health, security and environment related regulations/ guidelines at the work site	25	3	1	2
	PC2. Use Personal Protective Equipment (PPE) and other safety gear such as seat belt, body protection, respiratory protection, eye protection, ear protection and hand protection		3	0	3
	PC3. Follow safety measures during operations to ensure that the health and safety of self or others (including members of the public) is not at risk		3	1	2
	PC4. Carry out operations as per the manufacturer's and worksite related health and safety guidelines		3	1	2
	PC5. Handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines		2	0	2
	PC6. Follow safety regulations and procedures with regard to worksite hazards and risks		2	0	2
	PC7. Operate various grades of fire extinguishers, as applicable		2	0	2
	PC8. Support in administering basic first aid and report to concerned team members, as required, in case of an accident		2	0	2
	PC9. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility		3	1	2
	PC10. Record and report details related to operations, incidents or accidents, as applicable		2	0	2
		Total	25	4	21