

## Qualification Pack



# Hydraulic Excavator

## Excavator Operator

QP Code: IES/Q0103

NSQF Level: 4

Infrastructure Equipment Skill Council || Infrastructure Equipment Skill Council, Avik Royale-First Floor  
(Next of Vijaya Bank), No.6, 50 feet Main Road, Avalahalli Extension, Girinagar  
Bengaluru 560026

## Qualification Pack

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## Qualification Pack

### IES/Q0103: Excavator Operator

#### 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.

#### Applicable National Occupational Standards (NOS)

##### Compulsory NOS:

1. [IES/N0107: Carry out pre-operation checks on an excavator](#)
2. [IES/N0108: Operate an excavator](#)
3. [IES/N0109: Perform routine maintenance and troubleshooting of a excavator](#)
4. [IES/N7601: Comply with worksite health and safety guidelines](#)

#### Qualification Pack (QP) Parameters

<b>Sector</b>	Infrastructure Equipment
<b>Sub-Sector</b>	Equipment Operations
<b>Occupation</b>	Operator
<b>Country</b>	India
<b>NSQF Level</b>	4
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2004/8332.2
<b>Minimum Educational Qualification &amp; Experience</b>	8th Class with 2-3 Years of experience In lieu of minimum qualification, the incumbent should have 2 years of experience in driving excavator.
<b>Minimum Level of Education for Training in School</b>	

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<b>Pre-Requisite License or Training</b>	1. Training in excavator handling preferred. 2. Must have a valid Heavy Commercial Vehicle Driving License (HCV)
<b>Minimum Job Entry Age</b>	18 Years
<b>Last Reviewed On</b>	31/03/2015
<b>Next Review Date</b>	30/06/2020
<b>NSQC Approval Date</b>	18/06/2015
<b>Version</b>	1.0

## Qualification Pack

### IES/N0107: Carry out pre-operation checks on an excavator

#### Description

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

#### Scope

This unit/task covers the following: Pre-operation checks Documentation and Reporting

#### Elements and Performance Criteria

##### *Pre Operation Checks*

To be competent, the user/individual on the job must be able to:

- PC1.** adhere to time limits given by supervisor
- PC2.** ensure that turret and undercarriage are free of cracks and wear
- PC3.** confirm that the track & sprockets - for wear or cracked teeth
- PC4.** ensure that the boom and the stick are free of dents and cracked welds
- PC5.** confirm that the forks is without bends
- PC6.** make sure that oil levels of engine, transmission, radiant coolant and brake are as per manufacturers indicators
- PC7.** check differential and hydraulic oil levels
- PC8.** check the hydraulic hose and ram for leakages
- PC9.** conduct checks to ensure proper condition of parking brake, main horn, reverse horn and head light
- PC10.** check fan belt tension, electrolyte level and terminal tightness
- PC11.** conduct visual inspection to check the various controls, gauges, warning lamp and ensure that all safety and maintenance decals are available
- PC12.** check load chart is displayed in cabin
- PC13.** check and adjust driving position, rear and side mirrors, seat belts and set them as per comfort level
- PC14.** check the circle turn gear and clean if required
- PC15.** ensure air filter dust bowls are clean and check the gasket and inner filter
- PC16.** check and ensure that all cabin controls including electronic display are functioning properly
- PC17.** get water and sediments drained from the fuel tank
- PC18.** ensure coolant and oil in engine, transmission, etc. is topped up, if necessary as per manufacturers indicators
- PC19.** ensure that all greasing pins and pivots points are appropriately greased
- PC20.** examine the compressor unit and all fittings and air lines
- PC21.** check clearance of the drawbar ball and socket, look for excessive free play, and adjust if necessary

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**PC22.** ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)

**PC23.** keep footplates and steps clean and free from mud, dirt and oil

**PC24.** certify that no one is under or on the machine, before operating

### *Documentation and Reporting*

To be competent, the user/individual on the job must be able to:

**PC25.** maintain a checking/maintenance logbook to record all activities performed before starting the excavator

**PC26.** report defects precisely to the supervisor if beyond scope of his role

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

**KU1.** the organizations procedures and guidelines related to breakdown & maintenance services

**KU2.** the performance standards & procedures followed in the company

**KU3.** reporting structure in the company

**KU4.** escalation matrix for reporting unresolved problems

**KU5.** timeframe in which the complaint/problem should be resolved

**KU6.** work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process

**KU7.** location of tools

**KU8.** contact person in case of queries on procedure or products

**KU9.** location and process for storage and disposal of waste material

**KU10.** safety policy of the company

**KU11.** different types of excavators and their use and function

**KU12.** introduction to engine, transmission, their use and function

**KU13.** different types of hydraulic mechanisms

**KU14.** principles of friction

**KU15.** steering mechanisms and correct way of steering on slopes

**KU16.** significance of greasing and oiling parts of excavator that need routine lubrication

**KU17.** instrument panel / cabin controls, their location and operation

**KU18.** controls, levers and switches in order to operate the excavator properly

**KU19.** optimal working condition of excavator components e.g. hoist, propel system, power train, hoist, boom & stick and other attachments

**KU20.** optimal engine oil pressure, radiator coolant temperature

**KU21.** visual checks to identify damage, defects, cracks or leaks beforehand

## Generic Skills (GS)

User/individual on the job needs to know how to:

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- GS1.** record any deviations/ incidents as per prescribed norms
- GS2.** read and comprehend basic english to read manuals of operations
- GS3.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS4.** give clear instructions to co-workers, subordinates and other personnel
- GS5.** use correct technical terms while interacting with supervisor
- GS6.** decide when to conduct maintenance checks
- GS7.** work with supervisors/ team mates to carry out work related tasks
- GS8.** plan work according to the required schedule and location
- GS9.** plan for cleaning and lubricating the every day
- GS10.** provide service of the highest order to ensure customer satisfaction
- GS11.** identify immediate or temporary solutions to resolve mechanical issues
- GS12.** judge when to seek assistance from supervisor
- GS13.** identify cause and effect relations in his area of work
- GS14.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently
- GS15.** record any deviations/ incidents as per prescribed norms
- GS16.** read and comprehend basic english to read manuals of operations
- GS17.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS18.** give clear instructions to co-workers, subordinates and other personnel
- GS19.** use correct technical terms while interacting with supervisor
- GS20.** decide when to conduct maintenance checks
- GS21.** work with supervisors/ team mates to carry out work related tasks
- GS22.** plan work according to the required schedule and location
- GS23.** plan for cleaning and lubricating the every day
- GS24.** provide service of the highest order to ensure customer satisfaction
- GS25.** identify immediate or temporary solutions to resolve mechanical issues
- GS26.** judge when to seek assistance from supervisor
- GS27.** identify cause and effect relations in his area of work
- GS28.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Pre Operation Checks</i>	<b>9</b>	<b>57</b>	-	-
<b>PC1.</b> adhere to time limits given by supervisor	1	1	-	-
<b>PC2.</b> ensure that turret and undercarriage are free of cracks and wear	-	3	-	-
<b>PC3.</b> confirm that the track & sprockets - for wear or cracked teeth	1	2	-	-
<b>PC4.</b> ensure that the boom and the stick are free of dents and cracked welds	-	3	-	-
<b>PC5.</b> confirm that the forks is without bends	-	3	-	-
<b>PC6.</b> make sure that oil levels of engine, transmission, radiant coolant and brake are as per manufacturers indicators	1	2	-	-
<b>PC7.</b> check differential and hydraulic oil levels	-	3	-	-
<b>PC8.</b> check the hydraulic hose and ram for leakages	-	2	-	-
<b>PC9.</b> conduct checks to ensure proper condition of parking brake, main horn, reverse horn and head light	1	3	-	-
<b>PC10.</b> check fan belt tension, electrolyte level and terminal tightness	-	2	-	-
<b>PC11.</b> conduct visual inspection to check the various controls, gauges, warning lamp and ensure that all safety and maintenance decals are available	1	2	-	-
<b>PC12.</b> check load chart is displayed in cabin	-	2	-	-
<b>PC13.</b> check and adjust driving position, rear and side mirrors, seat belts and set them as per comfort level	-	3	-	-
<b>PC14.</b> check the circle turn gear and clean if required	-	2	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC15.</b> ensure air filter dust bowls are clean and check the gasket and inner filter	1	3	-	-
<b>PC16.</b> check and ensure that all cabin controls including electronic display are functioning properly	-	3	-	-
<b>PC17.</b> get water and sediments drained from the fuel tank	-	1	-	-
<b>PC18.</b> ensure coolant and oil in engine, transmission, etc. is topped up, if necessary as per manufacturers indicators	-	2	-	-
<b>PC19.</b> ensure that all greasing pins and pivots points are appropriately greased	-	3	-	-
<b>PC20.</b> examine the compressor unit and all fittings and air lines	1	3	-	-
<b>PC21.</b> check clearance of the drawbar ball and socket, look for excessive free play, and adjust if necessary	-	2	-	-
<b>PC22.</b> ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)	1	3	-	-
<b>PC23.</b> keep footplates and steps clean and free from mud, dirt and oil	1	2	-	-
<b>PC24.</b> certify that no one is under or on the machine, before operating	-	2	-	-
<i>Documentation and Reporting</i>	<b>1</b>	<b>3</b>	-	-
<b>PC25.</b> maintain a checking/maintenance logbook to record all activities performed before starting the excavator	1	2	-	-
<b>PC26.</b> report defects precisely to the supervisor if beyond scope of his role	-	1	-	-
<b>NOS Total</b>	<b>10</b>	<b>60</b>	-	-

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### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	IES/N0107
<b>NOS Name</b>	Carry out pre-operation checks on an excavator
<b>Sector</b>	Infrastructure Equipment
<b>Sub-Sector</b>	Equipment Operations
<b>Occupation</b>	Operator
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	31/03/2015
<b>Next Review Date</b>	31/03/2017
<b>NSQC Clearance Date</b>	18/06/2015

## Qualification Pack

### IES/N0108: Operate an excavator

#### Description

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

#### Scope

This unit/task covers the following: Excavator operations Load hauling and loading Load dumping

#### Elements and Performance Criteria

##### *Excavator operations*

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

##### *Load hauling and loading*

To be competent, the user/individual on the job must be able to:

- 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

##### *Load Dumping*

To be competent, the user/individual on the job must be able to:

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- 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
- PC20.** discharge the load safely at the position and in the manner designated by the supervisor
- PC21.** ensure that no other operators travel on or stand near the excavator
- PC22.** inform supervisor of any problems while operating the excavator

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the organizations procedures and guidelines related to breakdown & maintenance services
- KU2.** the performance standards & procedures followed in the company
- KU3.** reporting structure in the company
- KU4.** escalation matrix for reporting unresolved problems
- KU5.** timeframe in which the complaint/problem should be resolved
- KU6.** work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process
- KU7.** location of tools
- KU8.** contact person in case of queries on procedure or products
- KU9.** location and process for storage and disposal of waste material
- KU10.** safety policy of the company
- KU11.** different types of excavators and their specific use
- KU12.** appropriate usage of various attachments such as excavation bucket extreme excavation bucket skeleton bucket ditch cleaning bucket tiltable ditch cleaning bucket trapezoidal bucket, quick couplers pin grabber plus quick coupler hammers rock breaker contractors grapples demolition and sorting grapples and orange peel grapples etc
- KU13.** distinguish between different types of attachments
- KU14.** introduction to engine, transmission, their use and function
- KU15.** different types of hydraulic mechanisms
- KU16.** principles of friction
- KU17.** steering mechanisms and correct way of steering on slopes
- KU18.** significance of greasing and oiling, parts if excavator that need routine lubrication / daily maintenance activity which is mandatory
- KU19.** instruments panel, their location and operation
- KU20.** controls, levers and switches in order to operate the excavator properly
- KU21.** optimal working condition of excavator components e.g. hoist, propel system, power train and other attachments
- KU22.** optimal engine oil pressure, radiator coolant temperature
- KU23.** visual checks to identify damage, defects or leaks beforehand
- KU24.** general safety rules vis--vis digging and stacking
- KU25.** dangers of digging in vicinity of misfired shots

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- KU26.** all safety signs and other emergency signals
- KU27.** correct maintenance procedures for excavator
- KU28.** the location and procedure of using the emergency stop button
- KU29.** response to emergencies e.g. correct way to use fire extinguisher

## Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** record any deviations/ incidents as per prescribed norms
- GS2.** read and comprehend basic english to read manuals of operations
- GS3.** interpret stakes and signage on the road and during worksite operations
- GS4.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS5.** give clear instructions to co-workers, subordinates and other personnel
- GS6.** use correct technical terms while interacting with supervisor
- GS7.** assess for any damage/faulty component in the excavator and take action accordingly
- GS8.** decide when to perform appropriate driving operations i.e forward, reverse, 'u' turn, tight spot
- GS9.** work with supervisors/ team mates to carry out work related tasks
- GS10.** plan work according to the required schedule and location
- GS11.** provide service of the highest order to ensure customer satisfaction
- GS12.** identify immediate or temporary solutions to resolve mechanical issues
- GS13.** judge when to seek assistance from supervisor
- GS14.** identify possible ways to improve operational efficiency
- GS15.** suggest methods to avoid accidents/errors while operating machine
- GS16.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently
- GS17.** record any deviations/ incidents as per prescribed norms
- GS18.** read and comprehend basic english to read manuals of operations
- GS19.** interpret stakes and signage on the road and during worksite operations
- GS20.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS21.** give clear instructions to co-workers, subordinates and other personnel
- GS22.** use correct technical terms while interacting with supervisor
- GS23.** assess for any damage/faulty component in the excavator and take action accordingly
- GS24.** decide when to perform appropriate driving operations i.e forward, reverse, 'u' turn, tight spot
- GS25.** work with supervisors/ team mates to carry out work related tasks
- GS26.** plan work according to the required schedule and location
- GS27.** provide service of the highest order to ensure customer satisfaction
- GS28.** identify immediate or temporary solutions to resolve mechanical issues

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- GS29.** judge when to seek assistance from supervisor
- GS30.** identify possible ways to improve operational efficiency
- GS31.** suggest methods to avoid accidents/errors while operating machine
- GS32.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Excavator operations</i>	<b>1</b>	<b>16</b>	-	-
<b>PC1.</b> plan and organize the job according to given instructions	-	2	-	-
<b>PC2.</b> inspect the worksite to identify and loose soil, hidden deep trenches or marshy patches where excavator could get stuck	-	3	-	-
<b>PC3.</b> start the engine using ignition switch	-	3	-	-
<b>PC4.</b> use the priming pump and pre-heater to start the engine in cold weather conditions	-	3	-	-
<b>PC5.</b> identify and select the appropriate attachment to be used for performing the task at a work site	1	3	-	-
<b>PC6.</b> use the emergency stop button to disable all power to the excavator in case of a crisis, as per operator manual	-	2	-	-
<i>Load hauling and loading</i>	<b>4</b>	<b>26</b>	-	-
<b>PC7.</b> Operate the shifting quadrant device for selecting the correct gear range	1	3	-	-
<b>PC8.</b> ensure excavator load and operating speed is within limits specified by the manufacturer	1	3	-	-
<b>PC9.</b> look out for people working and hazards such as trenches, potholes and cables	-	2	-	-
<b>PC10.</b> adhere to time limits given by the supervisors	-	2	-	-
<b>PC11.</b> perform in-operation visual checks on critical temperature and pressure gauges	-	3	-	-
<b>PC12.</b> select and use the right type of brake in different situations and conditions	1	3	-	-
<b>PC13.</b> ensure that walkway rules e.g. operating the excavator within the permissible/ allocated areas are followed	-	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC14.</b> utilize judiciously various signaling devices available in the excavator as such as turn signal, parking indicator, air horn etc.	-	2	-	-
<b>PC15.</b> keep a safe distance from a tip edge and use an approved stop block before tipping over an edge	1	2	-	-
<b>PC16.</b> keep a safe distance from other plant or vehicles	-	2	-	-
<b>PC17.</b> judge the grade of the excavator travel limitation and operate accordingly	-	2	-	-
<i>Load Dumping</i>	<b>1</b>	<b>12</b>	-	-
<b>PC18.</b> ensure that excavator is always parked on firm, level ground; with handbrake applied and drive and controls disengaged	1	2	-	-
<b>PC19.</b> operate the body hoist control handle to maneuver the hydraulic ram that tips the dump	-	3	-	-
<b>PC20.</b> discharge the load safely at the position and in the manner designated by the supervisor	-	3	-	-
<b>PC21.</b> ensure that no other operators travel on or stand near the excavator	-	2	-	-
<b>PC22.</b> inform supervisor of any problems while operating the excavator	-	2	-	-
<b>NOS Total</b>	<b>6</b>	<b>54</b>	-	-



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### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	IES/N0108
<b>NOS Name</b>	Operate an excavator
<b>Sector</b>	Infrastructure Equipment
<b>Sub-Sector</b>	Equipment Operations
<b>Occupation</b>	Operator
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	31/03/2015
<b>Next Review Date</b>	31/03/2017
<b>NSQC Clearance Date</b>	18/06/2015

## Qualification Pack

# IES/N0109: Perform routine maintenance and troubleshooting of a excavator

## Description

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

## Scope

This unit/task covers the following: Routine maintenance Basic diagnostics and troubleshooting Documentation and Reporting

## Elements and Performance Criteria

### *Routine maintenance*

To be competent, the user/individual on the job must be able to:

- PC1.** assess the right service schedule by tracking machine operating hours
- PC2.** clean air filter dust bowls at regular intervals
- PC3.** clean footplates, pedals and steps free from mud, dirt, ice and snow at regular intervals
- PC4.** drain water and sediment/ fuel separators everyday
- PC5.** replenish coolants, lubricants and fluids everyday
- PC6.** grease all greasing pins and pivot points everyday
- PC7.** check battery levels and condition of the terminals and carry out minor adjustments if required
- PC8.** check and maintain the tyre rims, air pressure, wheel nuts and treads as per manufacturers indicators

### *Basic diagnostics and troubleshooting*

To be competent, the user/individual on the job must be able to:

- 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
- PC10.** complete timely and legibly daily/ weekly maintenance sheets as provided by the company
- PC11.** ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)
- PC12.** ensure that suitable props/ support devices are used and the bucket is not raised while performing maintenance
- PC13.** ensure that no maintenance task on the engine is performed when running or still hot
- PC14.** assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel
- PC15.** diagnose the problem
- PC16.** handle and dispose waste based on environmental guidelines at the work place

### *Documentation and Reporting*

To be competent, the user/individual on the job must be able to:

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- 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
- PC20.** report defects precisely to the supervisor if beyond scope of his role

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the organizations procedures and guidelines related to breakdown & maintenance services
- KU2.** the performance standards & procedures followed in the company
- KU3.** reporting structure in the company
- KU4.** escalation matrix for reporting unresolved problems
- KU5.** timeframe in which the complaint/problem should be resolved
- KU6.** work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process
- KU7.** location of tools
- KU8.** contact person in case of queries on procedure or products
- KU9.** location and process for storage and disposal of waste material
- KU10.** safety policy of the company
- KU11.** the organizations procedures and guidelines related to breakdown & maintenance services
- KU12.** the performance standards & procedures followed in the company kb3. reporting structure in the company
- KU13.** escalation matrix for reporting unresolved problems
- KU14.** timeframe in which the complaint/problem should be resolved
- KU15.** work target and review mechanism with supervisor for obtaining/ giving feedback related to performance process
- KU16.** location of tools
- KU17.** contact person in case of queries on procedure or products
- KU18.** location and process for storage and disposal of waste material
- KU19.** safety policy of the company

## Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** record any deviations/ incidents as per prescribed norms
- GS2.** read and comprehend basic english to read manuals of operations
- GS3.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS4.** give clear instructions to co-workers, subordinates and other personnel
- GS5.** use correct technical terms while interacting with supervisor

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- GS6.** decide when to conduct maintenance checks
- GS7.** evaluate the decision and conduct basic trouble shooting
- GS8.** work with supervisors/ team mates to carry out work related tasks
- GS9.** plan work according to the required schedule and location
- GS10.** plan for regular maintenance on a daily basis before machine operations
- GS11.** provide service of the highest order to ensure customer satisfaction
- GS12.** identify immediate or temporary solutions to resolve mechanical issues
- GS13.** judge when to seek assistance from supervisor
- GS14.** identify possible ways to improve operational efficiency
- GS15.** check for damages and diagnose common problems in the excavator and take relevant action
- GS16.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently
- GS17.** record any deviations/ incidents as per prescribed norms
- GS18.** read and comprehend basic english to read manuals of operations
- GS19.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS20.** give clear instructions to co-workers, subordinates and other personnel
- GS21.** use correct technical terms while interacting with supervisor
- GS22.** decide when to conduct maintenance checks
- GS23.** evaluate the decision and conduct basic trouble shooting
- GS24.** work with supervisors/ team mates to carry out work related tasks
- GS25.** plan work according to the required schedule and location
- GS26.** plan for regular maintenance on a daily basis before machine operations
- GS27.** provide service of the highest order to ensure customer satisfaction
- GS28.** identify immediate or temporary solutions to resolve mechanical issues
- GS29.** judge when to seek assistance from supervisor
- GS30.** identify possible ways to improve operational efficiency
- GS31.** check for damages and diagnose common problems in the excavator and take relevant action
- GS32.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Routine maintenance</i>	<b>3</b>	<b>22</b>	-	-
<b>PC1.</b> assess the right service schedule by tracking machine operating hours	-	3	-	-
<b>PC2.</b> clean air filter dust bowls at regular intervals	1	3	-	-
<b>PC3.</b> clean footplates, pedals and steps free from mud, dirt, ice and snow at regular intervals	-	3	-	-
<b>PC4.</b> drain water and sediment/ fuel separators everyday	1	2	-	-
<b>PC5.</b> replenish coolants, lubricants and fluids everyday	-	3	-	-
<b>PC6.</b> grease all greasing pins and pivot points everyday	-	3	-	-
<b>PC7.</b> check battery levels and condition of the terminals and carry out minor adjustments if required	-	2	-	-
<b>PC8.</b> check and maintain the tyre rims, air pressure, wheel nuts and treads as per manufacturers indicators	1	3	-	-
<i>Basic diagnostics and troubleshooting</i>	<b>2</b>	<b>20</b>	-	-
<b>PC9.</b> 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	1	3	-	-
<b>PC10.</b> complete timely and legibly daily/ weekly maintenance sheets as provided by the company	-	2	-	-
<b>PC11.</b> ensure the locking bar is in position to prevent the front and rear chassis moving and creating a crushing zone (articulated machines only)	-	3	-	-

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC12.</b> ensure that suitable props/ support devices are used and the bucket is not raised while performing maintenance	1	3	-	-
<b>PC13.</b> ensure that no maintenance task on the engine is performed when running or still hot	-	2	-	-
<b>PC14.</b> assess when the problem is beyond his competence and report the problem to suitably qualified and competent personnel	-	2	-	-
<b>PC15.</b> diagnose the problem	-	2	-	-
<b>PC16.</b> handle and dispose waste based on environmental guidelines at the work place	-	3	-	-
<i>Documentation and Reporting</i>	-	<b>8</b>	-	-
<b>PC17.</b> follow reporting procedures as laid down by the employer	-	2	-	-
<b>PC18.</b> complete all documentation in the prescribed standards in a timely manner	-	2	-	-
<b>PC19.</b> report and escalate problems/ incidents as required in a timely manner	-	2	-	-
<b>PC20.</b> report defects precisely to the supervisor if beyond scope of his role	-	2	-	-
<b>NOS Total</b>	<b>5</b>	<b>50</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	IES/N0109
<b>NOS Name</b>	Perform routine maintenance and troubleshooting of a excavator
<b>Sector</b>	Infrastructure Equipment
<b>Sub-Sector</b>	Equipment Operations
<b>Occupation</b>	Operator
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	31/03/2015
<b>Next Review Date</b>	31/03/2017
<b>NSQC Clearance Date</b>	18/06/2015

## Qualification Pack

### IES/N7601: Comply with worksite health and safety guidelines

#### Description

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

#### Scope

This unit/task covers the following: Worksite health and safety

#### Elements and Performance Criteria

##### *Worksite health and safety*

To be competent, the user/individual on the job must be able to:

- PC1.** comply with safety, health, security and environment related regulations/ guidelines at the work site
- 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
- 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
- PC4.** carry out operations as per the manufacturers and worksite related health and safety guidelines
- PC5.** handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines
- PC6.** follow safety regulations and procedures with regard to worksite hazards and risks
- PC7.** operate various grades of fire extinguishers, as applicable
- PC8.** support in administering basic first aid and report to concerned team members, as required, in case of an accident
- PC9.** respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility

#### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** health, safety, environmental (hse) and security related policies/ guidelines of the organization and the worksite
- KU2.** the importance of complying with health, safety, environmental and security guidelines at the worksite and during operations
- KU3.** contact details of personnel responsible for health, safety and environment (hse) related matters
- KU4.** location of worksite storage, site team and safe assembly points
- KU5.** concerned personnel to reach out in case of emergencies and accidents/ incidents
- KU6.** reporting and documentation procedures for hse and security matters
- KU7.** manufacturers guidelines related to health and safety requirements



## Qualification Pack

- KU8.** common types of health, safety, environment and security risks related to the worksite and operations
- KU9.** types, use and importance of personal protective equipment (ppe) and other safety gear
- KU10.** safe working practices to avoid common hazards and risks
- KU11.** guidelines for transport, storage and disposal of hazardous materials and waste
- KU12.** types of common hazards and risks at the worksite including fire, electrical, gas emergencies, accidents, incidents, structure collapse, machine breakdown
- KU13.** knowledge of safe lockdown/ stop of machinery use in case of emergencies and incidents/ accidents
- KU14.** types of fire extinguishers and their use
- KU15.** common injuries and appropriate basic first aid treatment eg. electrical shock, bleeding, wounds, fractures, minor burns, eye injuries

## Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** document and report any health and safety related incidents/ accidents
- GS2.** read and comprehend basic english to read manuals of operations
- GS3.** read all organizational and equipment related health and safety manuals and documents
- GS4.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS5.** give clear instructions to co-workers, subordinates and other personnel
- GS6.** use correct technical terms while interacting with supervisor
- GS7.** make an appropriate timely decision in responding to emergencies/accidents in line with organizational/ worksite guidelines
- GS8.** use correct ppe and other safety gear while at the worksite
- GS9.** work with supervisors/ team mates to carry out work related tasks
- GS10.** plan work according to the required schedule and location
- GS11.** build and maintain positive and effective relationships with colleagues and customers
- GS12.** seek appropriate assistance from other sources to resolve problems
- GS13.** assess the intensity of the fire accident and operate fire extinguishers
- GS14.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently
- GS15.** document and report any health and safety related incidents/ accidents
- GS16.** read and comprehend basic english to read manuals of operations
- GS17.** read all organizational and equipment related health and safety manuals and documents
- GS18.** read instructions, guidelines/procedures/rules related to the worksite and equipment operations
- GS19.** give clear instructions to co-workers, subordinates and other personnel
- GS20.** use correct technical terms while interacting with supervisor
- GS21.** make an appropriate timely decision in responding to emergencies/accidents in line with organizational/ worksite guidelines

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- GS22.** use correct ppe and other safety gear while at the worksite
- GS23.** work with supervisors/ team mates to carry out work related tasks
- GS24.** plan work according to the required schedule and location
- GS25.** build and maintain positive and effective relationships with colleagues and customers
- GS26.** seek appropriate assistance from other sources to resolve problems
- GS27.** assess the intensity of the fire accident and operate fire extinguishers
- GS28.** analyse, evaluate and apply the information gathered from observation, experience, reasoning, or communication to act efficiently

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Worksite health and safety</i>	<b>6</b>	<b>24</b>	-	-
<b>PC1.</b> comply with safety, health, security and environment related regulations/ guidelines at the work site	-	2	-	-
<b>PC2.</b> use personal protective equipment (ppe) and other safety gear such as seat belt, body protection, respiratory protection, eye protection, ear protection and hand protection	1	3	-	-
<b>PC3.</b> 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	1	3	-	-
<b>PC4.</b> carry out operations as per the manufacturers and worksite related health and safety guidelines	1	2	-	-
<b>PC5.</b> handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines	1	3	-	-
<b>PC6.</b> follow safety regulations and procedures with regard to worksite hazards and risks	1	2	-	-
<b>PC7.</b> operate various grades of fire extinguishers, as applicable	-	3	-	-
<b>PC8.</b> support in administering basic first aid and report to concerned team members, as required, in case of an accident	1	3	-	-
<b>PC9.</b> respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility	-	3	-	-
<b>NOS Total</b>	<b>6</b>	<b>24</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	IES/N7601
<b>NOS Name</b>	Comply with worksite health and safety guidelines
<b>Sector</b>	Infrastructure Equipment
<b>Sub-Sector</b>	Equipment Operations
<b>Occupation</b>	Operator
<b>NSQF Level</b>	4
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	31/03/2015
<b>Next Review Date</b>	31/03/2017
<b>NSQC Clearance Date</b>	18/06/2015

## Qualification Pack

### Assessment Guidelines and Assessment Weightage

#### Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ 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 Element/ PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

**Recommended Pass % : 70**

#### Assessment Weightage

##### Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
IES/N0107.Carry out pre-operation checks on an excavator	10	60	-	-	70	32
IES/N0108.Operate an excavator	6	54	-	-	60	29
IES/N0109.Perform routine maintenance and troubleshooting of a excavator	5	50	-	-	55	27

### Qualification Pack

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
IES/N7601.Comply with worksite health and safety guidelines	6	24	-	-	30	12
<b>Total</b>	<b>27</b>	<b>188</b>	<b>-</b>	<b>-</b>	<b>215</b>	<b>100</b>

## Acronyms

<b>NOS</b>	National Occupational Standard(s)
<b>NSQF</b>	National Skills Qualifications Framework
<b>QP</b>	Qualifications Pack
<b>TVET</b>	Technical and Vocational Education and Training

## Qualification Pack

### Glossary

<b>Sector</b>	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
<b>Scope</b>	Scope is a 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 quality of performance required.



## Qualification Pack

<b>Knowledge and Understanding (KU)</b>	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
<b>Organisational Context</b>	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
<b>Technical Knowledge</b>	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
<b>Core Skills/ Generic Skills (GS)</b>	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
<b>Electives</b>	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
<b>Options</b>	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.