

Model Curriculum

Supervisor Maintenance (Infrastructure Equipment)

SECTOR: INFRASTRUCTURE EQUIPMENT
SUB-SECTOR: EQUIPMENT SERVICE AND SPARES
**OCCUPATION: MANAGERIAL & SUPERVISORY-
EQUIPMENT SERVICE & SPARES**
REF ID: IES/Q1201, V1.0
NSQF LEVEL: 7



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

INFRASTRUCTURE EQUIPMENT SKILL COUNCIL

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: 'Supervisor Maintenance (Infrastructure Equipment)'
QP No. 'IES/ Q 1201 NSQF Level 7'

Date of Issuance: May 8th, 2018

Valid up to: May 7th, 2020


Authorized Signatory
(Infrastructure Equipment Skill Council)

TABLE OF CONTENTS

1. Curriculum	1
2. Trainer Pre-requisites	5
3. Annexure: Assessment Criteria	6

Supervisor Maintenance (Infrastructure Equipment)

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Supervisor Maintenance (Infrastructure Equipment)”, in the “Infrastructure Equipment” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Supervisor Maintenance (Infrastructure Equipment)		
Qualification Pack Name & Reference ID	IES/Q1201		
Version No.	1.0	Version Update Date	31 March 2015
Pre-requisites to Training	<ul style="list-style-type: none"> • Preferably Diploma/Degree in Mechanical/Electrical/ Automobile Engineering. • Experience: At least 6 years' experience as Mechanic across one or different streams of Engine/Hydraulics/Electrical • Training: Preferred on the job training and OEMs courses on Equipment Maintenance/ Advanced Diagnostics & Quality Systems 		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Supervise preventive maintenance & minor repair work by planning, mobilising and allocating equipment and manpower as per tasks and skillsets, followed by effective supervision of maintenance activities. • Supervise corrective maintenance of equipment by formulating maintenance schedule & predictive tests to avoid unscheduled breakdowns and judicious allocation of manpower resources. • Comply with workshop health and safety guidelines by following processes & procedures related to personal protective equipment, basic first aid for common injuries at work site, emergency evacuation and disposal of hazardous waste. 		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Supervisor Maintenance (Infrastructure Equipment)” Qualification Pack issued by “Infrastructure Equipment Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Supervise preventive maintenance & minor repair work</p> <p>Theory Duration (hh:mm) 18:00</p> <p>Practical Duration (hh:mm) 36:00</p> <p>Corresponding NOS Code IES/N1201</p>	<ul style="list-style-type: none"> • Create a preventive maintenance schedule as per the manufacturer’s guidelines and communicate to all the stakeholders • Arrange timely procurement of machine / equipment parts as necessary and their deployment at worksite. • Plan and schedule availability of mechanics, technicians, labour in adequate numbers to carry out preventive maintenance • Inspect and ensure all the tools used to monitor various functions of the equipment are calibrated and certified by the competent authority • Assist in planning and operationalization of the field workshop/ service, as per the project requirements • Supervise the commissioning and installation process of equipment at worksite as per the manufacturer’s instructions • Comply with all organizational policy instructions on safety, health and environment during equipment maintenance • Ensure through periodic walk-through checks that the service/ field workshop area is clean and free from hazards • Supervise the handling and disposal of waste based on environmental guidelines at the work place • Prepare equipment wise checklists and work instructions to ensure correct type of service and maintenance work is carried out. • Ensure third party equipment installed at the work place undergo preventive maintenance as per the laid down schedule • Ensure the quality of workmanship of mechanics/ technicians and guide them periodically as necessary. • Ensure faulty parts that are removed or replaced at the site are sent to the vendors without any delay for repair • Assist the manager in monitoring 	<ul style="list-style-type: none"> • Class room with audio-video system • Manufacturers related Equipment, Operations, Maintenance and Service/ Repair Manuals & Videos • Trouble shooting Guide & Diagnostic charts • Safety videos • PPE Items & Safety Gear • Lab/Workshop with standard diagnostic, repair tools/ accessories and facilities

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		<p>maintenance operations with regards to quality, timelines and budgets</p> <ul style="list-style-type: none"> Obtain a sign off from end users of the equipment as per organizational protocols Complete various records and documents as applicable to the scope and responsibility of a supervisor Ensure quality service is delivered as committed to achieve high levels of customer satisfaction. 	
2	<p>Supervise corrective maintenance of equipment.</p> <p>Theory Duration (hh:mm) 16:00</p> <p>Practical Duration (hh:mm) 32:00</p> <p>Corresponding NOS Code IES/N1202</p>	<ul style="list-style-type: none"> Formulate in consultation with the Maintenance Manager the system of maintenance cycle for Plant & Machinery (P&M) Distribute manpower resources for planned and unplanned work, based on the frequency and severity of breakdowns Create a system of predictive tests and analysis of equipment functionalities in consultation with the workshop/operations manager Provide data to manager about key performance parameters like mean time between failures and mean time to restore Design a system by which the supervisor is informed about the equipment break immediately on occurrence Identify the problem quickly by performing diagnostic breakdown analysis and initiate actions to rectify without delay. Operate the equipment after the repairs to ensure it is working properly and safely Obtain sign off from Manager under whose jurisdiction the equipment is working. Complete documentation and reporting to various stakeholders as applicable to the scope and responsibility of a supervisor Acquire the ability to read & understand as applicable general instructions/guidelines related to equipment service and repairs. Ensure quality service is delivered as committed to achieve high levels of customer satisfaction and positive feedback 	<ul style="list-style-type: none"> Class room with audio-video system Manufacturers related Equipment, Operations, Maintenance and Service/ Repair Manuals & Videos Trouble shooting Guide & Diagnostic charts Safety videos PPE Items & Safety Gear Lab/Workshop with standard diagnostic, repair tools/ accessories and facilities

Sr. No.	Module	Key Learning Outcomes	Equipment Required
3	<p>Comply with Workshop Health and Safety Guidelines</p> <p>Theory Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 12:00</p> <p>Corresponding NOS Code IES/N7602</p>	<ul style="list-style-type: none"> Comply with all safety, health, security and environmental regulations and guidelines at the workshop Carry out maintenance activities as per the manufacturer's guidelines and procedures to ensure safety of equipment and personnel Utilise Personal Protective Equipment (PPE) and other safety gear related to protection of body in an effective manner. Handle the transportation, storage and disposal of hazardous materials and waste in compliance with workshop health, safety and environmental guidelines Operate various types and grades of fire extinguishers, as applicable to the different categories of equipment Support in administering basic first aid and report to concerned staff in case of an accident Respond promptly and appropriately to an accident/ incident or an emergency situation, within limits of one's roles and responsibilities Record and report essential details related to operations, incidents or accidents as per the organisation's procedures. 	<ul style="list-style-type: none"> Class room with audio-video system Organisation's ESH / Safety Manuals & Videos PPE Items & Safety Gear Firefighting equipment & Charts First Aid Kit and Charts
	<p>Total Duration</p> <p>Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 80:00</p>	<p>Unique Equipment Required:</p> <ul style="list-style-type: none"> Class room with audio-video projection system Lab/Workshop with standard diagnostic, repair tools/ accessories and facilities Manufacturers related Equipment Operations & Maintenance Manuals, Workshop Service/ Repair Manuals & Videos Trouble shooting Guide & Diagnostic charts Safety videos PPE Equipment: Helmet, gloves, earplugs, goggles, safety shoes Firefighting equipment and 'How to Use' Charts First Aid Box and 'How to Do' Charts 	

Grand Total Course Duration: 120 Hours, 0 Minutes

(This syllabus/ curriculum has been approved by [Infrastructure Equipment Skill Council](#))

Trainer Pre-requisites for Job role: “Supervisor Maintenance (Infrastructure Equipment)” mapped to Qualification Pack: “IES/Q1201, v1.0”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “IES/Q 1201 Version 1.0”.
2	Personal Attributes	Aptitude for conducting training, with strong communication and interpersonal skills. Passion for training and developing others; well-organised; and a team player. Eager to learn and keep oneself updated with the latest in the mentioned field.
3	Minimum Educational Qualifications	Diploma in Mechanical/Automobile/Electrical Engineering preferred <u>Training Preferred</u> : OEMs certification courses on Operations, Maintenance and Service of Infrastructure Equipment.
4a	Domain Certification	Certified for Job Role: “ <u>Supervisor Maintenance (Infrastructure Equipment)</u> ” mapped to QP: “ <u>IES/Q 1201– Version 1.0</u> ”. Minimum accepted score 70%. Desired: Certification Training in Advanced Diagnostics & Quality Systems
4b	Platform Certification	Certified for the Job Role “ <u>Trainer</u> ” mapped to Qualification Pack MEP/Q0102. Minimum accepted score is 80%.
5	Experience	<ul style="list-style-type: none"> • Minimum 5 years’ experience of which at least 3 years’ should be as a supervisor in equipment maintenance. • At least 1 to 2 years’ experience in conducting training on equipment operations and maintenance.

Assessment Criteria	
Job Role	Supervisor Maintenance (Infrastructure Equipment)
Qualification Pack	IES/Q 1201 Version 1.0
Sector Skill Council	Infrastructure Equipment

Sl. No.	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 centre (as per assessment criteria given below)
4	Individual assessment agencies will create unique evaluation for skill practical for every student at each examination/training centre based on this criteria
5	To pass the Qualification Pack, every trainee should score a minimum of 50% 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	Total Marks	Marks Allocation		
			Out Of	Theory	Practical
1. IES/N1201 Supervise preventive maintenance and minor repair work	PC1. Create the preventive maintenance schedule and checklists as per parts and maintenance checklist	70	3	0	3
	PC2. Communicate maintenance plan to all the stakeholders like Site Supervisor/ Project Manager/ Maintenance Manager/ labour in-charge/ Material Manager/ Contract labour etc as per organizational protocol		4	1	3
	PC3. Arrange for procurement of machine / equipment parts whenever necessary as per organization protocol		3	0	3
	PC4. Arrange availability of hardware for repair work or raise indent for the same much before the preventive maintenance schedule		4	1	3
	PC5. Plan and schedule availability of mechanics, technicians, labour in adequate numbers to carry out preventive maintenance		3	0	3

	PC6. Inspect and validate if all the tools used to monitor the functioning of the equipment are calibrated and certified by competent authority	4	1	3
	PC7. Assist in planning and operationalization of the field workshop/ service, as required	3	0	3
	PC8. Supervise equipment commissioning/ installation process	2	0	2
	PC9. Comply with all organizational guidelines, SHE policy and quality standards during equipment maintenance	4	1	3
	PC10. Supervise the enforcement of all SHE related guidelines in equipment maintenance	2	0	2
	PC11. Carry out periodic walk-throughs to ensure that the service/ field workshop area is clean and free from hazards as per the Safety, Health and Environmental policy/ guidelines	3	1	2
	PC12. Supervise the handling and disposal of waste based on environmental guidelines at the work place	2	0	2
	PC13. Share equipment wise checklists and work schedule with the mechanics to ensure correct type of service (daily, weekly, monthly, quarterly, half yearly and yearly)/ maintenance activities are completed	3	1	2
	PC14. Assist the manager in monitoring maintenance operations with regards to timelines and budgets	2	0	2
	PC15. Ensure that third party equipment installed at the work place undergo preventive maintenance as per agreed schedule/ annual maintenance contract with the vendor	3	1	2
	PC16. Help and guide the mechanics, as required	2	0	2
	PC17. Check the workmanship of mechanics/ technicians and other personnel	2	0	2

	PC18. Ensure the faulty parts are replaced/ repaired on the site or sent to vendor for repair through Material department		3	1	2
	PC19. Ensure quality of workmanship of mechanics and enter the same in daily report		3	1	2
	PC20. Assist the workshop/ P&M manager in ensuring the quality of workmanship of third party vendors		2	0	2
	PC21. Check if the preventive maintenance work is complete as per the checklists given to all the mechanics		2	0	2
	PC22. Get a sign-off from the end user of the equipment like Site Engineer and/ or Project Head as per organizational protocol		3	1	2
	PC23. Document the details of the vendors in log-books/ organizational reports/ MIS/ vendor's worksheets etc. as per organizational protocol		3	0	3
	PC24. Complete documentation applicable to the role like reports, preventive maintenance log-books, spare parts usage log-books, sign-off reports, management Information Reports, and other reports as per the quality & reporting standards applicable to the organization		3	0	3
	PC25. Keep all the records in a way and at a place where it is easily accessible to the relevant personnel		2	0	2
		Total	70	10	60
2. IES/N1202 Supervise corrective maintenance of equipment	PC1. Formulate in consultation with the P&M/ Workshop Maintenance Manager the system of maintenance cycle for Plant & machinery (P&M)	50	3	0	3
	PC2. Divide the manpower of mechanics and other support personnel into teams and make them responsible for planned and unplanned work, based on the frequency and severity of breakdowns		3	0	3
	PC3. Plan for natural and manmade contingencies		4	1	3

	PC4. Create a predictive tests and analysis such as pressure , temperature, wear & tear checks, oil leakage test, hydraulic systems check, engine stress and gas exhaust system tests, wire life assessments etc. in consultation and advice of manage		4	1	3
	PC5. Provide data to manager about key performance parameters (like mean time between break-downs, cost of maintenance, power consumption, water consumption, oil and gas consumption, manpower utilization etc) as per CMA procedures		4	1	3
	PC6. Design a system by which the supervisor is informed about the break as soon as it occurs		4	1	3
	PC7. Identify the problem quickly by performing diagnostic breakdown analysis, study the equipment manuals		4	1	3
	PC8. Cordon off the area, switch off power source, move personnel to safe area, in-case of an emergency		4	1	3
	PC9. Deploy mechanics to address the break down, as per organization protocols		2	0	2
	PC10. Take immediate action so that the break down is rectified.		2	0	2
	PC11. Run the equipment after the repair to ensure its working appropriately and safely		3	1	2
	PC12. Note down all the critical parameters of performance of the equipment post repair		3	1	2
	PC13. Take sign off from Production/ Operation/ Project Manager under whose jurisdiction the equipment is working.		3	1	2
	PC14. Give information and data to Manager so as to make changes, if any, in the preventive maintenance schedule		3	1	2
	PC15. Ensure all the relevant stakeholders are informed about the rectification		2	0	2
	PC16. Ensure entries are made in log-books, ERP, and other organization specified reports		2	0	2
		Total	50	10	40

3. IES/N7602 Comply with workshop health and safety guidelines	PC1. Comply with safety, health, security and environment related regulations/ guidelines as per organizational/ manufacturer's policy	30	2	0	2
	PC2. Carry out maintenance operations as per the manufacturer's and workshop related health and safety guidelines/ standard operating procedures		3	1	2
	PC3. Follow safety regulations and procedures with regard to service workshop hazards and risks		2	0	2
	PC4. Use appropriate protective clothing/ equipment for specific tasks and work conditions as per service manual		3	1	2
	PC5. Lift and carry tools/equipment/components safely using correct procedure as per the service manual		3	1	2
	PC6. Use appropriate tools in a proper manner as given in the service manual		2	0	2
	PC7. Keep the work area free from clutter and spillage		3	1	2
	PC8. Store equipment and tools back at designated place post use and inspect to make sure they are not left behind		1	0	1
	PC9. Handle the storage and disposal of hazardous materials and waste in compliance with health, safety and environmental guidelines		4	1	3
	PC10. Operate various grades of fire extinguishers, as applicable		3	0	3
	PC11. Support in administering basic first aid and report to concerned team members, as required, in case of an accident		1	0	1
	PC12. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility		1	0	1
	PC13. Record and report details related to operations, incidents or accidents, as applicable		2	0	2
		Total	30	5	25
		Grand	150	25	125