NSDA Reference
To be added by NSDA

QUALIFICATION FILE – CONTACT DETAILS OF SUBMITTING BODY

Name and address of submitting body:

Infrastructure Equipment Sector Council

23-29, FF5, First Floor, "White House Building"

St. Marks Road, (Opp SBI)

Bengaluru - 560001

Name and contact details of individual dealing with the submission

Name: Name: Col Krishna Vijay

Position in the organisation: Director NOS & Training

Address if different from above

Tel number(s) +91 80 4212 6666

E-mail address krishna.vijay@iescindia.com

List of documents submitted in support of the Qualifications File

1. Annexure 1: Qualification Pack
2. Annexure 2: RFP for development of Occupational Standards
3. Annexure 3: Selection process of the Consultants to develop Occupational Standards
   - 3a. Minutes of the meeting of GC meetings
   - 3b. Composition of the Technical Committee
4. Annexure 4: Email approval of Occupational Standards by Technical Committee and Governing Council
5. Annexure 5: Occupational Analysis, List of companies and Industry associations participated in the development of these qualification packs (part of Occupational Analysis)
6. Annexure 6: List of QP/NOS validating companies
7. Annexure 7: NSDC QRC observation and feedback sheet
8. Annexure 8: Standard protocol for accreditation & assessments

QUALIFICATION FILE SUMMARY

Qualification Title	Qualification Pack- IES/Q1102- Junior Mechanic Engine
Body/bodies which will assess candidates	Infrastructure Equipment Sector Council
Body/bodies which will award the certificate for the qualification.	Infrastructure Equipment Sector Council
Body which will accredit providers to offer the qualification.	Infrastructure Equipment Sector Council
Occupation(s) to which the qualification gives access	Equipment maintenance
Proposed level of the qualification in the NSQF.	3
Anticipated volume of training/learning required to complete the qualification.	120 Hours
Entry requirements / recommendations.	Preferably Class VIII
Progression from the qualification.	Mechanic (Engine) in infrastructure equipment sector
Planned arrangements for RPL.	Under Development
International comparability where known.	**Canada:** Heavy Duty Equipment Technician NOC 7312

Formal structure of the qualification

Title of unit or other component (include any identification code used)	Mandatory/ Optional	Estimated size (learning hours)	Level
IES/N1102 Assist in repair and maintenance of equipment's engine parts	Mandatory	48	3
IES/N7801 Maintain the work area, tools and machine to support the operations	Mandatory	48	3
IES/N7602 Comply with workshop health and safety guidelines	Mandatory	24	3

Please attach any document giving further detail about the structure of the qualification – eg a Curriculum or Qualification Pack.

Give details of the document here: **Qualification Pack is attached as Annexure**

SECTION 1

ASSESSMENT

Name of assessment body:
If there will be more than one assessment body for this qualification, give details.

CII

Will the assessment body be responsible for RPL assessment?

Give details of how RPL assessment for the qualification will be carried out and quality assured.

RPL will be based on the same approved Qualification Pack and Assessment Criteria mentioned in the Qualification Pack.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:

The emphasis is on 'learning-by-doing' and practical demonstration of skills and knowledge based on the performance criteria.
The assessment papers are developed by Subject Matter Experts (SME) available with the Assessment Agency as per the performance and assessment criteria mentioned in the Qualification Pack. The assessments papers are also checked for the various outcome based parameters such as quality, time taken, precision, tools & equipment requirement etc. The assessment sets are then reviewed by IESC official for consistency.
The assessments are designed so as to assess maximum parts during the practical hands on work. The technical limitations at the training centres are taken care in theory and viva. Criteria such as use of lift to pick heavy objects or selection of fire extinguisher during a fire are also assessed under theory/viva.
The assessment agencies are instructed to hire assessors with integrity, reliability and fairness. Each assessor shall sign a document with its assessment agency by which they commit themselves to comply with the rules of confidentiality and conflict of interest, independence from commercial and other interests that would compromise impartiality of the assessments. The assessment agencies are instructed to ideally have assessor with minimum 15 years industry experience as an ITI graduate / minimum 10 years' industry experience as diploma engineer and minimum 5 years' industry experience as graduate engineer.
The assessors selected by Assessment Agencies are scrutinized and made to undergo training and introduction to IESC Assessment Framework, competency based assessments, assessors guide etc.
The assessors are provided with assessors guide developed by the Subject Matter Expert of the assessment agency as per the assessment framework. The assessment guides are developed to ensure the maximum possible consistency in the assessment by different assessors and elaborate on the following

- Qualification Pack Structure
- Guidance for the assessor to conduct theory, practical and viva assessments
- Guidance for trainees to be given by assessor before the start of the assessments.
- Guidance on assessments process, practical brief with steps of operations practical observation checklist and mark sheet
- Viva guidance for uniformity and consistency across the batch.

The assessment by assessment agency will be completely based on the assessment criteria as mentioned in the Qualification Pack. Each NOS in the Qualification Pack (QP) will be assigned a relative weightage for assessment based on the criticality of the NOS. Therein each Performance Criteria in the NOS will be assigned marks for or practical based on relative importance, criticality of function and training infrastructure.

The following tools are proposed to be used for final assessment:
Practical Assessment: This will comprise of a test hands on job to be prepared as per figure/engineering drawing by following appropriate working steps, using necessary tools, equipment and instruments.

Candidate's aptitude, safety consciousness, quality consciousness etc. will be ascertained by observation and

will be marked in observation checklist.

Viva/Structured Interview: This tool will be used to assess the conceptual understanding and the behavioural aspects as regards the job role and the specific task at hand. It will also include questions on safety, quality, environment, tools and equipment's etc.

Written Test: Under this test few key items which cannot be assessed practically will be assessed. The written assessment will comprise of
True / False Statements
Multiple Choice Questions
Matching Type Questions.

Optical Mark Recognition (OMR)/ Online System for this will be preferred.

Please attach any documents giving further information about assessment and/or RPL.
Give details of the document(s) here: Annexure 8

ASSESSMENT EVIDENCE

Complete the following grid for each grouping of NOS, assessment unit or other component as listed in the entry on the structure of the qualification on page 1.

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Junior Mechanic (Engine)

Qualification Pack IES/Q1102

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 evaulations 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 50% aggregare

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

				Marks Allocation	
NOS	**PC**	**Total Mark**	**Out Of**	**Theory**	**Skills Practical**
1. IES/N1102 Assist in repair and maintenance of infrastructure equipment's engine parts	PC1. Ensure availability of tools, spare parts, equipment and supplies for repair work	**34**	2	1	1
	PC2. Carry out visual inspection for leakage as per the mechanic's instruction		2	1	1
	PC3. Disassemble broken or defective engine part to facilitate repair as per Standard Operating procedure		1	0	1
	PC4. Reassemble when repairs are complete as per Standard Operating procedure		2	1	1
	PC5. Ensure appropriate Positioning of equipment, machinery, physical structures, and other objects for assembly or installation, using hand tools, power tools, and moving equipment as per mechanic's instruction		1	0	1
	PC6. ensure appropriate condition of tools, equipment, and machines as per Standard Operating Procedure		1	0	1

	PC7. Ensure cleaning or lubrication of engine components, equipment, instruments, tools, work areas, and other objects, using hand tools, power tools, and cleaning equipment as per the manufacturer's manual		4	1	3
	PC8. Assist the mechanic in preparing parts list for procurement		1	0	1
	PC9. Work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines		2	1	1
	PC10. Handle and dispose waste based on environmental guidelines at the work place		1	0	1
	PC11. Follow the maintenance schedule as per manufacturer's manual		1	0	1
	PC12. Assist in replacing the scheduled spare parts as per mechanic's instruction		1	0	1
	PC13. Assist in Replenish / change the consumables		1	0	1
	PC14. Perform visual inspection to Verify in appropriate sequence, for the engine, as per service manual, the following • leakage from parts • breakage of parts • unusual noise • under-rated performance		4	1	3

	PC15. Check the engine indication as per manufacturer's manual		1	0	1
	PC16. Check Air Filter as per manufacturer's manual		1	0	1
	PC17. Clean Air Filter as per manufacturer's manual		2	1	1
	PC18. Check Engine oil & coolant level as per manufacturer's manual		2	1	1
	PC19. Report any instances where the parts need to be changed/repaired as per company's guidelines		2	1	1
	PC20. Assist to Change/Repair the defective part as per mechanic's instructions		1	0	1
	PC21. Assist in post repair trials as per mechanic's instructions		1	0	1
		Total	**34**	**9**	**25**
2. IES/N7801 Maintain the work area, tools and machine to support the operations	PC1. Ensure safe handling of materials, machinery, equipment and tools	**23**	2	1	1
	PC2. Assist in carrying out checks to ensure the environmental conditions required are met		3	0	3
	PC3. Follow correct lifting and handling procedures		2	1	1

	PC4. Follow instructions with regard to materials to minimize waste		2	1	1
	PC5. Ensure a clean and hazard free working area		2	1	1
	PC6. Maintain tools and equipment as per organization guidelines and manufacturer's instructions		4	1	3
	PC7. Report the need for maintenance and/or cleaning outside your area of responsibility		2	1	1
	PC8. Report unsafe equipment and other dangerous occurrences		1	0	1
	PC9. Ensure good condition of the appropriate machine guards for equipment		1	0	1
	PC10. Ensure use of appropriate cleaning equipment and methods appropriate for the work to be carried out		2	1	1
	PC11. Carry out cleaning according to schedules and limits of responsibility		1	0	1
	PC12. Ensure safe disposal of waste.		1	0	1
		Total	**23**	**7**	**16**
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	**28**	2	1	1
	PC2. Carry out maintenance operations as per the		4	1	3

	manufacturer's and workshop related health and safety guidelines/ standard operating procedures				
	PC3. Follow safety regulations and procedures with regard to service workshop hazards and risks		2	1	1
	PC4. Use appropriate protective clothing/ equipment for specific tasks and work conditions as per service manual		2	1	1
	PC5. Lift and carry tools/equipment/components safely using correct procedure as per the service manual		4	1	3
	PC6. Use appropriate tools in a proper manner as given in the service manual		4	1	3
	PC7. Keep the work area free from clutter and spillage		2	1	1
	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		1	0	1
	PC10. Operate various grades of fire extinguishers, as applicable		2	1	1
	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	1	1
		Total	**28**	**9**	**19**

SECTION 2

EVIDENCE OF NEED

What evidence is there that the qualification is needed? (annexure 4 &5) • Based on industry feedback and extrapolating from the data received from various visits and questionnaires we have arrived at roles which comprise of approximately 80% of the workforce in the infrastructure equipment sector across the respective sub-sectors undertaken in this study. • This have been prioritized keeping the following criteria in consideration: • High volumes of equipment sales • Inclusive of the critical roles captured in the feedback from the companies • Inclusive of the feedback received from the council members • Governing council of IESC gave final approval and endorsement for the same.
What is the estimated uptake of this qualification and what is the basis of this estimate? • Skills Gap analysis Reports for industry demand and secondary research data, though these do not lend to accurate demand projection. • Feedback from industry for demand though sample size may not lend to accurate figures • Training duration, and current and potential training capacity envisaged • As per industry practice Mechanic is required per 15 equipment
What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF? • NSDC list of Approved and Under-Development QPs was checked prior to commissioning the work • Consultations with Construction Sector Skill Councils • NSDC QRC team also confirmed the same
What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated? • Employer feedback will be sought post-placement • A formal review is scheduled in two year time

Please attach any documents giving further information about any of the topics above.
Give details of the document(s) here:

Annexure 4: Email approval of Occupational Standards by Technical Committee and Governing Council

Annexure 5: Section 3 and 4.1 of Occupational Analysis

Annexure 7: NSDC QRC observation and feedback sheet

SECTION 3

SUMMARY EVIDENCE OF LEVEL

Level of qualification:

Three

Summary of Direct Evidence (from learning outcomes):

Justify the NSQF level allocated to the QP by building upon the five descriptors of NSQF. Explain the reasons for allocating the level to the QP.

Generic NOS is/are linked to the overall authority attached to the job role

Summary of other evidence (if used):

Junior Mechanic (Engine) - IES/Q1102					
Process Required	**Professional Knowledge**	**Professional Skill**	**Core Skill**	**Responsibility**	**Level**
Junior Mechanic Engine is expected to assist in visual inspection under mechanic's instruction and perform minor repair. He has to maintain the work area, tools and instruments and ensure good working condition of required tools and instruments. The activities identified requires	Junior Engine Mechanic is expected to have ***basic knowledge of the*** Engines of infrastructure equipment. ***Basic Knowledge of visual inspection techniques*** and methods and techniques to check the tool's calibration **Basic understanding** of removing the components from the engine system and **basic knowledge** of the various tools used for the job Considering the ***basic professional knowledge***, which a Junior Mechanic has for equipment maintenance this QP is pegged at Level 03.	Junior Engine Mechanic ***performer's visual inspection*** of engine system as per the maintenance schedule/ manual and under mechanic's instructions He ***conducts the basic repair*** as per laid procedure using appropriate tools He keep the tools and instruments in working condition Thus he is	Junior Engine Mechanic is ***expected to*** *conduct the basic visual inspection and* ***report the faults to mechanic and follow mechanic's instructions*** Junior Mechanic has to continuously give and receive instruction and guidance from mechanic and supervisors in workshop for repair and routine maintenance work hence they are expected to be good in ***communication***	The jobholder is responsible to: • Assist in troubleshooting and diagnosis of engine • Assist in breakdown repair of engine • Assist in routine maintenance of engine • Maintain tools and work area He has the ***limited responsibility for own*** work and majorly ***function in close supervision*** of Mechanic which justifies the pegging of the	3

routine and limited range of activities for him as these activities are independent of job and worksite he is deployed on. Considering the outcomes the job roles is pegged at level 03		***practically engaged*** in the maintenance of engine assemblies and sub-assemblies	***skills***. Jobholder is expected to conduct themselves in ways, which show a basic understanding of the ***social and professional environment of working at workshops and on field visits***	QP at level 3 and not involved in self-learning (which is a requirement for Level 4). In his routine activity he is responsible for his own work (which is a requirement of level 2).	
Level 3	Level 3	Level 3	Level 3	Level 3	

SECTION 4

EVIDENCE OF RECOGNITION OR PROGRESSION

What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

While designing the national occupational standards, occupational mapping was done on a large sample size and validated across the country. The career progression for roles in each occupation was also analysed and decided, based on industry validation across the country. The current challenges faced by the industry, at large, was also kept in mind.

Please attach any documents giving further information about any of the topics above.
Give details of the document(s) here:

- Annexure 5: Section 5 of Occupational Analysis
- List of companies and Industry associations participated in development of these qualifications (part of OA)