

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

NSDA Reference

To be added by NSDA

Name and address of submitting body:

Infrastructure Equipment Sector Council

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Name and contact details of individual dealing with the submission

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List of documents submitted in support of the Qualifications File

1. Annexure 1: Qualification Pack
2. Annexure 2: IESC & LabourNet Agreement for development of Occupational Standards
3. Annexure 3: Approval of GC on the classification of small, medium and large companies for NOS development
4. Annexure 4: GC resolution for formation of NOS Sub-committee
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

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

SUMMARY

Qualification Title	Crusher Operator		
Qualification Code	IES/Q0112		
Nature and purpose of the qualification	<p>Nature of Qualification</p> <ul style="list-style-type: none"> • Qualification Pack <p>Purpose of Qualification</p> <ul style="list-style-type: none"> • To enable candidate to become a Crusher Operator 		
Body/bodies which will award the qualification	Infrastructure Equipment Sector Council		
Body which will accredit providers to offer courses leading to the qualification	Infrastructure Equipment Sector Council		
Body/bodies which will carry out assessment of learners	Infrastructure Equipment Sector Council		
Occupation(s) to which the qualification gives access	Equipment operations- Crusher Operator		
Licensing requirements	N/A		
Level of the qualification in the NSQF	4		
Anticipated volume of training/learning required to complete the qualification	208 Hours		
Entry requirements and/or recommendations	Preferably Class VIII		
Progression from the qualification	Senior Crusher Operator		
Planned arrangements for the Recognition of Prior learning (RPL)	Presently the industry has a large work force of operators and mechanics who are trained and experienced but not certified as per the NSQF norms. It is proposed to certify them under the RPL (Recognition of Prior Learning) program which will go a long way in facilitating their career progression.		
International comparability where known	<p>UK – NOS COSVR224 – Carry out concrete crushing operations.</p> <p>This standard is about interpreting information; adopting safe and healthy working practices; selecting materials and equipment; preparing and operating equipment for crushing concrete.</p>		
Date of planned review of the qualification.	30/04/18		
Formal structure of the qualification			
Title of component and identification code.	Mandatory/ Optional	Estimated size (learning)	Level

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

		hours)	
IES/N0113 Carry out pre-operation checks on a crusher	M	32	4
IES/N0114 Carry out crushing operations	M	102	4
IES/N0115 Carry out maintenance and troubleshooting of the crusher	M	42	4
IES/N7601 Comply with worksite health and safety guidelines	M	32	4

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

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information. Qualification Pack is attached as Annexure 1

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

SECTION 1 ASSESSMENT

Body/Bodies which will carry out assessment:

Confederation of Indian Industries (CII)

How will RPL assessment be managed and who will carry it out?

RPL program is designed to assess and certify those personnel with the requisite qualifications and experience. In the first step, individuals are screened and assessed, both through theory and practical tests, based on the same Assessment Criteria of the approved Qualification Pack. The skill gaps are thus identified and individuals undergo 'bridge training' as applicable. Then at the end of the short course they are finally assessed and certified.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable 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 to assess the conceptual understanding, 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

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

assessment based on the criticality of the NOS- unique (functional)/ common NOS for job roles at the same levels. 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:

Each NOS in the QP will be assigned a relative weightage for assessment based on the functional importance of each. Further each Performance Criteria in the NOS will be assigned marks based on relative functional importance; which is in turn divided into theory and practical assessment. Overall practical constitutes 70% and written 30% of total marks.

Viva/Structured Interview: This tool will be used to assess select conceptual understandings related to practical handling of equipment and procedures with specific tasks at hand; and behavioral aspects of the job role. It will also include questions on tools & equipment; safety and environment

Written Test: This tool will be used to assess general conceptual knowledge / understanding and other aspects of the job role which are either not feasible or difficult to assess practically. 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.

ASSESSMENT EVIDENCE

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Crusher Operator

Qualification Pack IES/Q 0112

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 centre (as per assessment criteria 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 40% in each NOS and 60% 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.

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

Assessment Outcomes	Assessment Criteria for the outcome	Total Mark	Marks Allocation		
			Out Of	Theory	Skills Practical
1. IES/N0113 Carry out pre-operation checks on a crusher	PC1. Conduct visual inspection around the crushing equipment	30	3	1	2
	PC2. Check for power connections electrical/diesel generators including fuel checks		2	0	2
	PC3. Ensure the moveable parts in crushers like conveyor belts, rollers, stringers, etc. are free from wear and tear		2	0	2
	PC4. Check if all the filters are free of impurities		3	1	2
	PC5. Lubricate all the moving joints of the crushers as per the operational manual		3	1	2
	PC6. Check all the feeders for any wear and tear or malfunctioning		2	0	2
	PC7. Check the fittings, bolts, bearings, pads and lining in each crushers of the crushing unit as per the operational manual		2	1	1
	PC8. Inspect the screeners for its suitability with the production requirement		1	0	1
	PC9. Check Vertical Shaft Impactor (VSI) crusher, tips, liners, etc.		2	1	1
	PC10. Check the tyre condition for required air pressure, cut/damage in wheeled crusher as per the operational manual.		1	0	1

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

	PC11.Check the wheel bolts, brakes, etc. in wheeled crusher		1	0	1
	PC12.Check and tighten the track pads bolts, nuts, etc. in tracked crusher as per the production requirements		2	1	1
	PC13.Check the hoses, pipes for any leakage and take actions if necessary		0.5	0	0.5
	PC14.Ensure optimal working conditions of the motors used for different functions in the crushing unit		1.5	1	0.5
	PC15.Ensure there is enough raw materials at the site before starting the operation		0.5	0	0.5
	PC16.Coordinate with other vehicle operators for procurement of the raw material as per standards of the organisation		1.5	1	0.5
	PC17.Maintain a checking/maintenance logbook to record all activities performed before starting the operation		0.5	0	0.5
	PC18.Report defects precisely to the supervisor if beyond scope of the role		1.5	1	0.5
		Total	30	9	21
2. IES/N0114 Carry out crushing operations	PC1.Read work orders to determine production specifications and information	35	3	1	2
	PC2.Examine materials, ingredients, or products, visually or with hands, to ensure conformance to established standards		3	1	2

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

	PC3.Clean work areas and check for obstructions before starting the operations		1	0	1
	PC4.Inspect chains, gear box, rollers, belts, scrolls, etc. for signs of wear during the operation		2	1	1
	PC5.Dislodge and clear jammed materials or other items from machinery and equipment using appropriate tools		1	0	1
	PC6.Transfer materials, supplies, and products between work areas, using moving equipment and hand tools as per the standards of the organisation		2	1	1
	PC7.Follow production operating procedures to start up, shut down, and optimize the process		1	0	1
	PC8.Start or stop machine as per the signals and messages received from junior operators/ helpers		1	0	1
	PC9. Set mill gauges as per the fineness required for the grind		2	1	1
	PC10.Monitor equipment to ensure continuity of flow, safety, and efficient operation, and to detect malfunctions		1	0	1
	PC11.Observes gauges, dials, and operation of machinery		1	0	1
	PC12.Weigh or measure materials, ingredients, or products at specified intervals to ensure conformance to the standards,		2	1	1

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

	PC13.Ensure proper graded flow of materials into the crushers and control the speed and flow of material through conveyors		2	1	1
	PC14.Test samples of materials or products to ensure compliance with Indian standard(IS) specifications		2	1	1
	PC15.Coordinate with the vehicle operators for collection of the output		1	0	1
	PC16.Wear dust masks, safety eye glasses, safety helmet, protective cloth, safety gloves as per the standards		2	1	1
	PC17.Identify various hazards at workplace like flying stones, etc. and take necessary actions		1	0	1
	PC18.Make positive eye contact with other equipment operators at the site before crossing		1	0	1
	PC19.Follow emergency response procedures		2	1	1
	PC20.Perform lockout and tag out whenever necessary		1	0	1
	PC21.Adhere to environmental environment guidelines		1	0	1
	PC22.Record input and output flow as per the desired formats of the organization		2	0	2
		Total	35	10	25
3. IES/N0115 Carry out maintenance and troubleshooting of the crusher	PC1.Arrange for and perform scheduled maintenance as the organizational standards	20	2	1	1
	PC2.Check the tyre condition – proper air pressure, any		1	0	1

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

	cut/damage in wheeled crusher regularly				
	PC3.Check bearings at gearboxes, rollers and motors as per the operational manual		1	0	1
	PC4.Replenish coolants, lubricants, fluids and screeners as and when required		2	1	1
	PC5.Inspect oil, fuel tanks for leaks and take necessary actions as per the operational manual		1	0	1
	PC6.Lubricate all the moving parts at regular intervals		1	0	1
	PC7.Perform periodic equipment structural inspection and corrective measures like welding when required		2	1	1
	PC8.Adjust the crusher settings before, during and after the operation		1	0	1
	PC9.Check crusher plate, liners, other critical parts conditions and take corrective measures immediately		2	1	1
	PC10.Identify service needs, defects, hazardous conditions and take daily, weekly, monthly and yearly preventive or corrective maintenance		1	0	1
	PC11.Arrange for and assist repair or replacement of defective components		2	1	1
	PC12.Read indicators that signal need for replacement		1	0	1
	PC13.Identify missing or defective components or controls and replace		0.5	0	0.5

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

	them with genuine OEM recommended components				
	PC14.Comply with safety requirements		0.5	0	0.5
	PC15.Maintain records and documentation relating to service, such as log books, repair lists, etc.		1.5	1	0.5
	PC16.Follow reporting procedures as laid down by the employer		0.5	0	0.5
		Total	20	6	14
4. IES/N7601 Comply with worksite health and safety guidelines	PC1.Comply with safety, health, security and environment related regulations/ guidelines at the work site	15	2	1	1
	PC2.Use Personal Protective Equipment (PPE) and other safety gear as applicable to the equipment and the worksite		1	0	1
	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		1	0	1
	PC4.Carry out operations as per the manufacturer's and worksite related health and safety guidelines		2	1	1
	PC5.Handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines		1	0	1

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

	PC6. Operate various grades of fire extinguishers, as applicable		2	1	1
	PC7. Support in administering basic first aid and report to concerned team members, as required, in case of an accident		1	0	1
	PC8. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility		3	1	2
	PC9. Record and report details related to operations, incidents or accidents, as applicable		2	0	2
		Total	15	4	11

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

SECTION 2

EVIDENCE OF LEVEL

Title/Name of qualification/component: Crusher operator			Level: 4
NSQF Domain	Key requirements of the job role	How the job role relates to the NSQF level descriptors	NSQF Level
Process	Crusher Operator is expected to conduct pre-operation checks on Crusher, select the appropriate attachment for the job, operate the crusher as per the job and do basic maintenance	The activities identified are the familiar and routine activities for him as these activities are independent of job and worksite he is deployed on. For e.g.: conducting pre-operational checks before starting the equipment, checks on the feeders and screeners, etc. Considering the outcomes the job roles is pegged at level 04	4
Professional knowledge	Operator is expected to have knowledge of the functioning and operation of Crushing equipment. Feature/specifications of the various attachment used and knowledge of crushing components, pre-operation checklist and routine maintenance	Considering the in-depth professional and factual knowledge , which a Crusher Operator has for crushing operation and maintenance such as basics of engine and motors, types of raw materials, method of lubricating, etc. this QP is pegged at Level 4.	4
Professional skill	Crusher Operator identifies the appropriate attachment for various job like feeding, screening, conveying, etc. He checks the crushing equipment for operation readiness using pre-operation checklist and conducts the routine maintenance covering lubrication, oil levels, coolant, air filters, motors, tyre, body structure and keep the records as per the operations manual & standard operating procedures.	He is practically engaged in the crushing operation and maintenance. The major skills required of the crushing operator are recording of deviations, comprehension of sign symbols, communication, etc. Therefore the QP is set at level 4	4
Core skill	Operator is expected to be read and understand the various instrument panel, fluid levels and other indicators for pre-operation checks and routine maintenance. He has to set mill gauges as per the fineness required for the grind. All of this requires application of basic arithmetic principles .	Operator has to continuously give and receive instruction and guidance from co-workers on-site for starting the crushing equipment & dumping functions hence they are expected to be good in communication skills .	4

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

Title/Name of qualification/component: Crusher operator		Level: 4	
NSQF Domain	Key requirements of the job role	How the job role relates to the NSQF level descriptors	NSQF Level
		Jobholder is expected to conduct themselves in ways, which show a basic understanding of the <i>social and professional environment of working at construction, mining or other sites</i>	
Responsibility	<p>The jobholder is responsible to:</p> <ul style="list-style-type: none"> • Conduct pre-operation checks • Operate the crusher • Conduct routine maintenance • Comply with worksite health and safety <p>For each work site there can be variations in usage and operation of the crusher. So the jobholder based on his <i>own learning and experience</i>, identify appropriate attachment and operation process to maximize the productivity efficiently. He is continuously engaged in the <i>self-learning process</i> and he has the <i>responsibility for own</i> work.</p>	Jobholder is majorly responsible for his own job and self-learning process which justifies the pegging of the QP at level 4 and not directly responsible for learning and work of others (which is a requirement for Level 5). In his routine activity he is free from supervision (which is a requirement of level 3).	4

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

SECTION 3

EVIDENCE OF NEED

What evidence is there that the qualification is needed?

The job roles have been formulated based on 'occupational mapping and functional analysis' involving manufacturers and customers/ end users of the infrastructure equipment sector products. Further these have been validated by all segments of the industry i.e. small, medium and large customers. The methodology / questionnaire and certificates in support for all have been enclosed.

What is the estimated uptake of this qualification and what is the basis of this estimate?

The Occupational Analysis Report in support of these job roles has taken into account the industry growth and expected demand over the coming years. These statistics and other details have been covered in depth under the relevant sections of the same.

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 Skill Councils for Construction and Mining Sector
- 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 years time

Please attach any documents giving further information about any of the topics above.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

Annexure 5: Section 3 and 4.1 of Occupational Analysis

Annexure 7: NSDC QRC observation and feedback sheet

NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

SECTION 4

EVIDENCE OF 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.

Crusher Operator (Level 4) > Senior Crusher Operator (Level 5) > Master Operator/Trainer Operator (Level 6) > Supervisor (Level 7)

**Level= NSQF level*

Please attach any documents giving further information about any of the topics above.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

Annexure 5: Section 5 of Occupational Analysis

Annexure 5: List of companies and Industry associations participated in development of these qualifications (Annexure B)