

Revised Application Documentation: Revision made by NSDA_25 May 2015

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

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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/Q0201- Supervisor (Plant & Machinery) | | |
| 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 | Supervisory role in Equipment Operations | | |
| Proposed level of the qualification in the NSQF. | 7 | | |
| Anticipated volume of training/learning required to complete the qualification. | 120 Hours | | |
| Entry requirements / recommendations. | Preferably Diploma in Mechanical/ Automobile Engineering | | |
| Progression from the qualification. | Nil, Will be developed in next phase | | |
| Planned arrangements for RPL. | Under Development | | |
| International comparability where known. | European, Australian and Canadian NOSs, No direct comparability established. | | |
| Formal structure of the qualification | | | |
| Title of unit or other component (include any identification code used) | Mandatory/ Optional | Estimated size (learning hours) | Level |
| IES/N0201Plan and supervise equipment operations | Mandatory | 42 | 7 |
| IES/N0201Manage equipment operations related stakeholders | Mandatory | 42 | 7 |
| IES/N0203Comply with worksite safety and quality standards | Mandatory | 18 | 7 |
| IES/N7601Comply with worksite health and safety guidelines | Mandatory | 18 | 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 Supervisor (Plant & Machinery)

Qualification Pack IES/Q0201

Sector Skill Council Infrastructure Equipment

Guidelines for Assessment

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

| Assessable Outcomes | Assessment criteria for the outcome | Marks Allocation | | | |
|---|---|------------------|--------|--------|------------------|
| | | Total Marks | Out Of | Theory | Skills Practical |
| 1. IES/N0201 Plan and supervise equipment operations | PC1. Plan and schedule equipment operations in accordance with organization, SHE and worksite guidelines and procedures | 40 | 4 | 1 | 3 |
| | PC2. Plan and align equipment and resources required as per the task | | 3 | 0 | 3 |
| | PC3. Select the equipment as per the project requirements | | 3 | 0 | 3 |
| | PC4. Allocate the schedule of operators and other P&M support personnel as per the project requirements | | 3 | 0 | 3 |
| | PC5. Appropriately allocate work to subordinate team-mates as per their experience/ skill levels | | 4 | 1 | 3 |
| | PC6. Train and brief them on the work allotted | | 4 | 1 | 3 |
| | PC7. Communicate job expectations, based on task and site conditions, clearly to the team-mates | | 3 | 1 | 2 |
| | PC8. Monitor and supervise operations on an ongoing basis to meet project requirements | | 2 | 0 | 2 |
| | PC9. Carry out appraisals and training of the team-mates at regular intervals | | 3 | 1 | 2 |
| | PC10. Adhere to organization and worksite level policies/ procedures during operations | | 3 | 1 | 2 |
| | PC11. Adhere to relevant quality processes/ standards during | | 3 | 1 | 2 |

| | | | | | |
|--|---|--------------|-----------|----------|-----------|
| | operations | | | | |
| | PC12. Complete role related documentation and reporting | | 3 | 1 | 2 |
| | PC13. Resolve process level issues or queries based on interactions with other stakeholders and supervisors | | 2 | 0 | 2 |
| | | Total | 40 | 8 | 32 |
| 2. IES/N0202 Manage equipment operations related stakeholders | PC1. Receive work instructions and feedback from reporting manager or other senior construction team personnel at the work site | 50 | 3 | 1 | 2 |
| | PC2. Carry out work related activities in compliance with instructions and worksite requirements | | 3 | 1 | 2 |
| | PC3. Analyze and present operations data like MTBF, MTTR, productivity analysis, cost to company etc on a periodic basis | | 5 | 0 | 5 |
| | PC4. Generate system based requests for spares and consumables | | 3 | 0 | 3 |
| | PC5. Report to manager and other stakeholders periodically on equipment operations | | 2 | 0 | 2 |
| | PC6. Keep stakeholders informed about repairs and maintenance of tools and machinery as required | | 3 | 1 | 2 |
| | PC7. Assist the P&M manager in finalizing process-flow and resource level improvements | | 3 | 1 | 2 |
| | PC8. Assist the P&M manager in providing alternative economical but productive and safe alternatives from an operations perspective | | 3 | 1 | 2 |

| | | | | | |
|---|---|--------------|-----------|----------|-----------|
| | PC9. Communicate to manager about employee management, i.e., shortages or performance related | | 4 | 1 | 3 |
| | PC10. Communicate any potential hazards or expected process disruptions | | 3 | 0 | 3 |
| | PC11. Plan for re-work based on feedback provided by manager/ other stakeholders | | 3 | 0 | 3 |
| | PC12. Provide correct and reliable feedback on equipment and personnel to the P&M manager | | 3 | 1 | 2 |
| | PC13. Assist the P&M Manager to estimate the potential equipment/ manpower requirements from sub-contractors | | 3 | 0 | 3 |
| | PC14. Assist in the evaluation of sub-contractors as per the equipment required | | 3 | 0 | 3 |
| | PC15. Validate the submission of sub-contractor related documentation and work sheets as per company policy | | 3 | 0 | 3 |
| | PC16. Supervise sub-contractor personnel in order to get optimum work performance | | 3 | 0 | 3 |
| | | Total | 50 | 7 | 43 |
| 3. IES/N0203 Comply with worksite safety and quality standards | PC1. Comply with all organizational guidelines, SHE policy and quality standards during equipment operations | 40 | 3 | 0 | 3 |
| | PC2. Supervise the enforcement of all SHE related guidelines in equipment operations | | 2 | 0 | 2 |
| | PC3. Plan procurement and provide safety gear and other equipment required to personnel for safe and productive | | 3 | 0 | 3 |

| | | | | | |
|--|---|--|---|---|---|
| | operations. | | | | |
| | PC4. Carry out fire/ other disaster recovery drills on work site along with the SHE team | | 3 | 0 | 3 |
| | PC5. Inspect fire extinguishers and other machine equipment for validity and plan procurement/ renewal for necessary equipment | | 3 | 0 | 3 |
| | PC6. Carry out periodic walk-throughs to ensure that the worksite and workshop areas are clean and free from hazards as per the Safety, Health and Environmental policy/ guidelines | | 3 | 1 | 2 |
| | PC7. Supervise the handling and disposal of waste based on environmental guidelines at the work place | | 3 | 0 | 3 |
| | PC8. Participate, as required, in the investigation of near misses, accidents and incidents at the work site with the SHE and project management teams. | | 3 | 1 | 2 |
| | PC9. Assist in gathering data and complete documentation related to accidents/ incidents and share with concerned personnel | | 2 | 0 | 2 |
| | PC10. Assist with checking the project management plan to ensure operations are as per the quality and productivity specifications outlined | | 3 | 0 | 3 |
| | PC11. Carry out routine random checks and inspections to keep a check on the quality of work carried out | | 3 | 1 | 2 |

| | | | | | |
|---|---|--------------|-----------|----------|-----------|
| | PC12. Inspect damage to equipment and suggest rectification as per the work protocol and quality standards | | 3 | 1 | 2 |
| | PC13. Give feedback to team and stakeholders on the quality and productivity at the worksite on the continuous basis | | 3 | 1 | 2 |
| | PC14. Carry out role related documentation and reporting | | 3 | 1 | 2 |
| | | Total | 40 | 6 | 34 |
| 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 | 30 | 3 | 0 | 3 |
| | 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 | | 4 | 1 | 3 |
| | PC3 .Follow safety measures during operations to ensure that the health and safety of self or others (including members of the public) is not at risk | | 3 | 0 | 3 |
| | PC4. Carry out operations as per the manufacturer’s and worksite related health and safety guidelines | | 3 | 0 | 3 |
| | PC5. Handle the transport, storage and disposal of hazardous materials and waste in compliance with worksite health, safety and environmental guidelines | | 4 | 1 | 3 |
| | PC6. Follow safety regulations and procedures with regard to worksite hazards and risks | | 2 | 0 | 2 |

| | | | | | |
|--|--|--------------|-----------|----------|-----------|
| | PC7. Operate various grades of fire extinguishers, as applicable | | 2 | 0 | 2 |
| | PC8. Support in administering basic first aid and report to concerned team members, as required, in case of an accident | | 3 | 0 | 3 |
| | PC9. Respond promptly and appropriately to an accident/ incident or emergency situation, within limits of your role and responsibility | | 3 | 1 | 2 |
| | PC10. Record and report details related to operations, incidents or accidents, as applicable | | 3 | 1 | 2 |
| | | Total | 30 | 4 | 26 |

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

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:

Seven

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):

| Supervisor (Plant & Machinery)- IES/Q0201 | | | | | |
|--|--|--|---|---|-------|
| Process Required | Professional Knowledge | Professional Skill | Core Skill | Responsibility | Level |
| <p>Supervisor (Plant and Machinery) is expected to overall manage the project site and ensure availability of equipment and resources as per the project requirement. He has to plan, schedule, and select appropriate equipment and resources</p> <p>He has to analyse the production, productivity data and cost to company and report to superiors.</p> | <p>Supervisor (P&M) is expected to have knowledge of the functioning and operation of various infrastructure equipment required at the work site.</p> <p>Feature/specifications of the Infrastructure Equipment and knowledge of planning, scheduling and criteria to select the appropriate equipment for a specific job</p> <p>He has to have in depth understanding of the concept of productivity and quality systems and how to monitor the same</p> <p>Considering the in-depth professional and factual knowledge of the broad contexts, which a supervisor has for supervision of the</p> | <p>Supervisor (P&M) identifies the appropriate vendor and equipment based on the project requirement and specification.</p> <p>He has to monitor and track the equipment operation and create mitigation plan in case of downtime</p> <p>He has to take appropriate steps to increase productivity and reduce the cost to company</p> <p>Thus he is practically engaged in the</p> | <p>Supervisor is expected to be analyse production and productivity data and report to supervisors.</p> <p>He has to identity the appropriate equipment based on the equipment specifications and project requirement.</p> <p>He has to collect relevant information from others to generate plan and schedule of activity.</p> <p>Supervisor has to continuously give and receive instruction and guidance from superiors and</p> | <p>The jobholder is responsible to:</p> <ul style="list-style-type: none"> Plan and supervise equipment operations Manage equipment related stakeholders Develop Manpower deployed for equipment operations <p>Supervisor (P&M) is fully responsible for the equipment operations and productivity of the deployed equipment on worksite.</p> <p>Jobholder is responsible for on-site</p> | 7 |

| | | | | | |
|--|---|---|---|---|--|
| <p>He has to identify the appropriate equipment vendors.</p> <p>Supervises the worksite Safety, Health, environment and quality guidelines in equipment operations</p> <p>The activities identified requires command of wide range specialised theoretical and practical skills with varying routine</p> <p>Considering the outcomes the job roles is pegged at level 07</p> | <p>equipment operation this QP is pegged at Level 07.</p> | <p>equipment operations and crisis management in case of emergencies.</p> | <p> juniors on-site for smooth equipment operation on worksite hence they are expected to be good in communication skills.</p> <p>Jobholder is expected to conduct themselves in ways, which show a basic understanding of the social and professional environment of working at worksite</p> | <p>productivity of all the equipment deployed on worksite and the development of the manpower engaged in equipment operations and not directly involved in management of unpredictable crises (which is a requirement for Level 8).</p> <p>In his routine work he is not only responsible for his own work and learning but fully responsible for the team output and team develop (which is a requirement of level 6).</p> | |
| Level 7 | Level 7 | Level 7 | Level 7 | Level 7 | |

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)