

**NSQF QUALIFICATION FILE**

**Approved in 24<sup>th</sup> NSQC Dated 27<sup>th</sup> Feb, 2020**

**NSDA Code**

**2020/CCM/DGT/03651**

**CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE**

Directorate General of Training (DGT)  
Government of India, Ministry of Skill Development and Entrepreneurship,  
1st and 2nd Floor, CIRTES Building  
Next to Pusa ITI, Pusa Campus  
New Delhi – 110012.

**Name and address of submitting body:**

Directorate General of Training (DGT)  
Government of India, Ministry of Skill Development and Entrepreneurship,  
1st and 2nd Floor, CIRTES Building  
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New Delhi – 110012.

**Name and contact details of individual dealing with the submission**

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Position in the organisation: Deputy Director General (C & P)

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**List of documents submitted in support of the Qualifications File**

1. Competency-based curriculum with following details:

Model Curriculum to be added which will include the following:

1. Indicative list of tools/equipment to conduct the training: Enclosed with curriculum
2. Trainers qualification: Indicated in the curriculum
3. Lesson Plan: All DGT curricula are designed indicating specific practical to be carried out during training along with details of trade theory. Based on this the concerned instructor prepares the Lesson Plan and demonstration plan with support of IMPs developed by NIMI, DGT.
4. Distribution of training duration into theory/practical/OJT component: Indicated in the curriculum.

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2. Curriculum for Core Skills (Workshop Calculation & Science, Engineering Drawing and Employability Skills).

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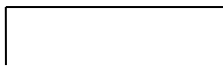
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## 5. SUMMARY

1	<b>Qualification Title</b>	<b>'Marine Engine Fitter'</b>
2	<b>Qualification Code, if any</b>	<b>DGT/1086</b>
3	<b>NCO code and occupation</b>	7233.0300 - Mechanic, Petrol Engine. 8211.0600 - Assembler, Stationary Diesel Engine.
4	<b>Nature and purpose of the qualification (Please specify whether qualification is short term or long term)</b>	Prepare skilled Technician to undertake the job roles of Marine Engine Fitter and will enable the trainee to locate defects, repairs, and overhaul stationary petrol engines for correct performance to drive pumps, generators, propulsion shafts, etc.  It is long term qualification.
5	<b>Body/bodies which will award the qualification</b>	Directorate General of Training (DGT).
6	<b>Body which will accredit providers to offer courses leading to the qualification</b>	Directorate General of Training (DGT) accredits the Training providers (ITIs/ NSTIs/MSTIs/BTCs/BTPs / Industries / Establishments).
7	<b>Whether accreditation/affiliation norms are already in place or not , if applicable (if yes, attach a copy)</b>	Yes. The accreditation/ affiliation norms and any amendments made from time to time are available on DGT web portal.
8	<b>Occupation(s) to which the qualification gives access</b>	<ul style="list-style-type: none"> <li>• 7233.0300 - Mechanic, Petrol Engine.</li> <li>• 8211.0600 - Assembler, Stationary Diesel Engine.</li> </ul>
9	<b>Job description of the occupation</b>	The individual dismantles engine according to nature of defects and measures essential parts such as cylinder bore, crank pins, pistons etc., using cylinder gauge, micrometer and other appropriate tools. Gets cylinders rebored, valve seats refaced and liners filled if necessary. Fits and taps pistons in cylinders, decarbonizes cylinder head and grinds valves using appropriate abrasives, Replaces or repairs worn out or damaged parts and assembles them, doing supplementary tolling as necessary to ensure accuracy of fit etc.

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10	Licensing requirements	NOT REQUIRED		
11	Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided)	NOT APPLICABLE		
12	Level of the qualification in the NSQF	Level 4		
13	Anticipated volume of training/learning required to complete the qualification	Sl. No.	Course Element	Notional Training Hours
		1	Professional Skill (Trade Practical)	1000
		2	Professional Knowledge (Trade Theory)	280
		3	Workshop Calculation & Science	80
		4	Engineering Drawing	80
		5	Employability Skills	160
			Total	1600
14	Indicative list of training tools required to deliver this qualification	As per Annexure I of curriculum.		
15	Entry requirements and/or recommendations and minimum age	Passed 10th Class with Science and Mathematics. Minimum age 14 years as on first day of academic session		
16	Progression from the qualification (Please show Professional and academic progression)	An Individual can proceed for:		
		Professional <ul style="list-style-type: none"> <li>• Technician</li> <li>• Senior Technician</li> <li>• Supervisor</li> <li>• Manager</li> <li>• Entrepreneur</li> </ul>	Technical / Academic  ATS CITS Diploma/ Advance Diploma (Vocational)	

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17	<b>Arrangements for the Recognition of Prior learning (RPL)</b>	<ul style="list-style-type: none"> <li>Yes (For more details refer “Guidelines for Private candidate” in DGT website MIS portal).</li> </ul>		
18	<b>International comparability where known (research evidence to be provided)</b>	-		
19	<b>Date of planned review of the qualification.</b>	5 Yrs. from the Date of Approval		
20	<b>Formal structure of the qualification</b>			
	<b>Mandatory components</b>			
	<b>Title of component and identification code/NOSs/ Learning Outcomes</b>	<b>Estimated size (learning hours)</b>		<b>Level</b>
		<b>Skills</b>	<b>Knowledge</b>	
<b>TRADE SPECIFIC</b>				
(i)	Plan and organize the work to make job as per specification applying different types of basic fitting operation and check for dimensional accuracy following safety precautions. [Basic fitting operation: marking, hack sawing, chipping, filing, drilling, Tapping] following safety precautions.	150	42	3
(ii)	Demonstrate different joining operations observing standard procedure. [Different joints – bolt joints, riveting, gas welding arc welding, brazing, lock nut, cotter split pin etc.]	75	21	3
(iii)	Perform dismantling & assembling of multi-cylinder marine engine as per Makers’ manual and check functionality.	275	77	3
(iv)	Overhaul Oil pump, Filters, Radiator, Cooling system and check functionality.	50	14	4

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(v)	Overhaul air compressor, turbo charger and perform Gas charging & leak Testing of engine refrigeration.	50	14	4
(vi)	Check the cooling & lubrication system and conduct necessary maintenance as per requirement	25	7	4
(vii)	Diagnosis engine faults Erect & Install Engines and ensure functionality.	175	49	4
(viii)	Repair & maintain Fuel feed systems, fuel Injection pump.	75	21	4
(ix)	Maintain shop floor tools & Equipments as per standard procedure.	50	14	4
(x)	Measure and test Electrical / Electronics circuits/ components and check performance.	75	21	4
<b>CORE SKILL</b>				
<b>EMPLOYABILITY SKILLS</b>				
(i)	Apply safe working practices.	-	20	4
(ii)	Comply with environment regulation and housekeeping.		20	4
(iii)	Interpret & use formal and technical communication.		20	4
(iv)	Apply the concept in productivity & quality management in day to day work to improve productivity & quality.		20	4
(v)	List and interpret various acts of labour welfare legislation.		20	4
(vi)	Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.		20	4
(vii)	Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.		20	4

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(viii)	Utilize basic computer applications and internet to take benefit of IT developments in the industry.		20	4
<b>WORKSHOP CALCULATION &amp; SCIENCE</b>				
(i)	Demonstrate basic mathematical concept and principles to perform practical operations.	-	40	4
(ii)	Explain basic science in the field of study including simple machine.		40	4
<b>ENGINEERING DRAWING</b>				
(i)	Read and apply engineering drawing for different application in the field of work.	-	80	4
	<b>Total</b>		1600	

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21	<p><b>Body/Bodies which will carry out assessment:</b> Controller of Examinations, DGT</p>
22	<p><b>How will RPL assessment be managed and who will carry it out?</b> DGT will carry out the RPL assessment following the below mentioned eligibility criteria for Trainee:</p> <p>Applicants aspiring to appear as Private Candidates in the AITT under CTS for award of NTC, have been categorized based on their educational background and experience. Subsequently 'Private Candidates' may be admitted under one of the following categories. Category wise 'eligibility criteria' for appearing as 'Private Candidate' in AITT under CTS has been listed below:</p> <p>Category I: Ex-trainees (successful pass-outs) of ITI</p> <p>A. Ex-trainees of ITI who already possess NTC in one of the trades under CTS, are eligible for applying as Private candidate for an allied trade, provided he/ she fulfils all the conditions regarding educational qualification etc. prescribed for that allied trade.</p> <p>B. In addition, the applicant should possess minimum of 1 year experience (as on date of submission of application) post the date of AITT result declaration in the desired allied trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.</p> <p>Category II: 'Ex-trainees (successful pass-outs) and current trainees under CoE scheme</p> <p>A. The applicant should have the minimum prescribed entry qualification and should fulfil eligibility criteria for the desired trade under CTS, in which he/she intends to appear for AITT as Private Candidate. CoE candidates must register as 'Private Candidate' under CTS in the relevant/mapped CTS trade only.</p> <p>B. There should be a minimum gap of 1 year between successful completions of CoE training i.e. from the date of result declaration to the date of submission of application for 'Private Candidate' certification.</p> <p>C. During this gap of 1 year, the candidate must have undergone Industry training or gained experience in desired trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the</p>



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	<p>concerned State.</p> <p>Category III: SCVT Candidates (admitted till August 2018 session)  A. No special provisions have been made for SCVT Trainees to enrol as 'Private Candidate'. Going forward, SCVT trainees have been granted equivalence vide G.S.R 186(E) dated 2nd March 2017 for undergoing apprenticeship training under the Apprentices Act 1961 to obtain 'NAC'.  B. Only for SCVT trainees admitted till August 2018 batch, provision has been made for obtaining NTC by appearing in AITT under 'Private Candidate'. Such trainees will continue to be governed by old guidelines for 'Private Candidate'.</p> <p>Category IV: Other Candidates (candidate not falling in any of the above 3 categories, including SCVT trainees enrolled from admission session 2019 onwards)  A. The applicant should have the minimum prescribed entry qualification and should fulfil eligibility criteria for the relevant trade under CTS, in which he/she desires to appear for AITT as Private Candidate.  B. Applicant should be minimum 21 years of age on the date of submission of application. There is no upper age limit.  C. The applicant should possess minimum of 3 years' experience (on the date of submission of application) in the relevant trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.  For detail and updated information please refer to DGT web portal.</p>
23	<p><b>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.</b></p> <p><b>(1) Assessment process:</b>  The assessment for the qualification is carried out by conducting formative assessments, and end of year examinations (Summative). The formative assessments in respect of each Learning Outcome for practical and related theory are conducted by the concerned instructors for evaluating the knowledge and skill acquired by trainees and the behavioural transformation of the trainees. This formative assessment is primarily carried out by collecting evidence of competence gained by the trainees by evaluating them at work based on assessment criteria, asking questions</p>

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and initiating formative discussions to assess understanding and by evaluating records and reports. Summative assessment is carried out by All India Trade Test on Trade Theory, Trade practical, Workshop Calculation & Science, Engineering Drawing and Employability Skills. The question papers for the theory Examinations contain objective type questions.

The marking pattern and distribution of marks for the qualification are as under:

Marking Pattern			
Sl. No.	Type of Assessment	Subject for the Trade Test	Marks
1	Summative Assessment	Practical	250
2		Trade Theory	100
3		Employability Skills	50
4		Workshop Calculation and Science.	50
5		Engineering Drawing	50
6	Formative assessment based on Learning Outcomes		200
TOTAL:			700

**(2) Minimum pass marks:**

The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%. There will be no Grace marks.

**Testing and certifications for the course:**

Controller of examinations, DGT carries out the assessment and issues National Trade Certificate (NTC) following the norms and guidelines issued by the Directorate from time to time.

**Overall assessment strategy:**

Assessment of the qualification evaluates trainees to show that they can integrate knowledge, skills and values for carrying out relevant tasks as per the defined learning outcomes and assessment criteria. The trainees may

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choose the preferred language for assessment. The underlying principle of assessment is fairness and transparency. While assessing the trainee, assessor is directed to assess as per the defined assessment criteria against the learning outcomes. The evidence of the competence acquired by the trainees can be obtained by conducting theory and practical examinations, observing the trainees at work, asking questions and initiating discussions to assess, understand and evaluate records and reports. The ultimate objective of the assessment is to assess the candidates as per the defined assessment criteria for the learning outcomes.

**Specific Arrangements for assessment:**

- Assessment is outcome-based.
- There are formative and summative assessments in Theory and Practical.
- Assessment is carried out in Trade theory, Trade Practical, Workshop

Calculation and Science, Engineering Drawing and Employability Skills.

- While Trade Theory and Trade Practical are used for assessing Trade-related jobs, Workshop Calculation and Science is used to test trainee's numerical and logical skills, Drawing is used to test the ability of the trainee to draw and read sketches and Employability skills is used to test the communication, professional language, leadership, entrepreneurship and team-work abilities of the trainee.
- In addition to demonstration of theory and practical knowledge, trainees get a chance to present total personality.

**Quality assurance activities:**

Question papers are set by external paper setters/ software generated.

Evaluation of Theory Examinations in Trade, Workshop Calculation & Science, Engineering Drawing and Employability Skill is done by third-party agency.

Trade Practical is examined by External Examiner.

**24. Assessment evidences****Title of Component: Formative Assessment Breakup**

( on half yearly average of the learning assessment covered)

**Means of assessment**

Assessment will be evidence based comprising the following for each Learning Outcome:

Serial	Terminal Competency	Maximum
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No.		Weightage (%)
1	Safety consciousness	15
2	Workplace hygiene	5
3	Attendance/ Punctuality	10
4	Ability to follow Manuals/ Written instructions	5
5	Application of Knowledge	10
6	Skills to handle tools / equipment/ Instruments/ Devices	10
7	Economical use of materials	5
8	Working Strategy	10
9	Quality in workmanship/ Performance	15
10	VIVA	15
	Total Maximum Weightage (%)	100

**Pass/Fail**

The minimum pass percentage is 60% marks for formative assessment.

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<b>LEARNING OUTCOME (TRADE SPECIFIC)</b>	
<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<p>1. Plan and organize the work to make job as per specification applying different types of basic fitting operation and check for dimensional accuracy following safety precautions. [Basic fitting operation: marking, hack sawing, chipping, filing, drilling, Tapping] following safety precautions.</p>	Observe safety procedure during all the operations as per the standard norms and guidelines.
	Plan the various operations involved, identify the tools and instruments and make this available in time.
	Obtain suitable raw material free from defects.
	Mark the dimensions on the job with marking tools as per standards.
	Carryout the operations like hack sawing, chipping, filing etc as per the specification.
	Inspect the finished job as per the standard procedure and to ensure dimensions are within prescribed limit.
<p>2. Demonstrate different joining operations observing standard procedure. [Different joints – bolt joints, riveting, gas welding arc welding, brazing, lock nut, cotter split pin etc.]</p>	Plan and select appropriate tools and materials for timely use.
	Set the equipment observing safety
	Perform joining as per requirement
	Check the joint for conforming standard procedure of standard requirement
	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.

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3. Perform dismantling & assembling of multi-cylinder marine engine as per Makers' manual and check functionality.	Plan & select appropriate tools equipment for the work and make it available timely.
	Dismantle the different components of multi cylinder marine engine.
	Check for any defects/correctness & measure dimensions of the components using appropriate instruments.
	Demonstrate possible solutions within the team using desired mathematical skills, knowledge of facts, principles, processes and general concept in the field of work.
	Solve problems during operation by selecting and applying basic methods, tools, materials and collect and organize information for quality output
	Assemble components & check functionality of engine.
4. Overhaul Oil pump, Filters, Radiator, Cooling system and check functionality.	Understand the procedure of the dismantling, servicing and assembling of the oil Pumps.
	Check the dismantled pumps and its parts and assemble the pumps in systematic order.
	Check filters during cleaning and re-assembly and precautions to be taken while working
	Identify Radiator, cooling system of Marine engine
	Check water pump refitting, adjustment of fan belt tension and connection of water pump with radiator hoses & flushing cooling system of the engine
5. Overhaul air compressor, turbo charger and perform Gas charging & leak Testing of engine refrigeration.	Demonstrate risks involved in working with compressed air for auxiliary purposes.
	Overhaul Air compressor & Turbo charger
	Check & measure components by using appropriate instruments
	Charge gas to Refrigeration plants and check the performance

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	Perform leak testing and maintenance of compressor and connected equipment
6. Check the cooling & lubrication system and conduct necessary maintenance as per requirement.	Identify various parts of cooling and lubrication system and their functions.
	Plan & select appropriate tools to carry out the work
	Remove the parts of cooling & lubrication system and perform required maintenance as per standard procedure.
	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
	Observe safety/ precaution during the work.
	Test the cooling & lubrication system to check functionality
7. Diagnosis engine faults Erect & Install Engines and ensure functionality.	Plan & Collect relevant information to perform trouble shooting of Engine
	Diagnose the various defect & fault of engine
	Practice in erecting overhauled engines on stands & foundation
	Starting engine on foundation and observing for permissible vibrations
8. Repair & maintain Fuel feed systems, fuel Injection pump	Select appropriate tools & equipment and make use of them timely manner
	Dismantle fuel injector & feed pump
	Assemble and adjust the feed pump & Injector
	Test fuel feed system performance.
	Check the fuel injection pump performance as per set procedure
9. Maintain shop floor tools & Equipments as per standard procedure.	Collect relevant information related to shop floor equipment performance.
	Prepare Maintenance schedule to check daily, weekly, monthly for different Engines & Auxiliary Machines.
	Record the shop floor equipment on their utilization and maintenance.

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10. Measure and test Electrical / Electronics circuits/ components and check performance.	Study of AC & DC Current
	Identify the Basic Electrical & Electronic Parts
	Test for the simple circuits
	Check the performance as set procedure

<b>LEARNING OUTCOME (CORE SKILL)</b>	
<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>EMPLOYABILITY SKILLS</b>	
1. Apply safe working practices	Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy.
	Recognize and report all unsafe situations according to site policy.
	Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	Identify, handle and store / dispose off dangerous goods and substances according to site policy and procedures following safety regulations and requirements.
	Identify and observe site policies and procedures in regard to illness or accident.
	Identify safety alarms accurately.
	Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	Identify and observe site evacuation procedures according to site policy.
	Identify Personal Protective Equipment (PPE) and use the same as per related working environment.
	Identify basic first aid and use them under different circumstances.



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	Identify different fire extinguisher and use the same as per requirement.
2. Comply with environment regulation and housekeeping	Identify environmental pollution & contribute to the avoidance of instances of environmental pollution.
	Deploy environmental protection legislation & regulations
	Take opportunities to use energy and materials in an environmentally friendly manner.
	Avoid waste and dispose waste as per procedure
	Recognize different components of 5S and apply the same in the working environment.
3. Interpret & use formal and technical communication.	Obtain sources of information and recognize information.
	Use and draw up technical drawings and documents.
	Use documents and technical regulations and occupationally related provisions.
	Conduct appropriate and target oriented discussions with higher authority and within the team.
	Present facts and circumstances, possible solutions & use English special terminology.
	Resolve disputes within the team.
	Conduct written communication.
4. Apply the concept in productivity & quality management in day to day work to improve productivity & quality.	Explain the concept of productivity and apply during execution of job.
	Explain the concept of quality tools and apply during execution of job.
5. List and interpret various acts of labour welfare legislation.	Explain basic concept of labour welfare legislation, adhere to responsibilities and remain sensitive towards such laws.
	Knows benefits guaranteed under various acts.
6. Explain energy conservation, global warming and pollution and contribute in day	Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution.

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to day work by optimally using available resources.	Explain standard procedure for disposal of waste.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	<p>Explain personnel finance and entrepreneurship.</p> <p>Explain role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the policies/ programmes, procedure &amp; the available scheme.</p> <p>Prepare a report to become an entrepreneur for submission to financial institutions.</p>
8. Utilize basic computer applications and internet to take benefit of IT developments in the industry.	<p>Explain the basic hardware of personal computer.</p> <p>Use common application software viz., word, excel, power point etc., in day to day work.</p> <p>Awareness about useful internet websites, search relevant information pertaining to the assigned tasks.</p>
<b>WORKSHOP CALULATION &amp; SCIENCE</b>	
1. Demonstrate basic mathematical concept and principles to perform practical operations.	<p>Solve different problems like phase angle, etc. with the help of a calculator.</p> <p>Demonstrate conversion of Fraction to Decimal and vice versa.</p> <p>Explain BCD code, conversion from decimal to binary and vice-versa, all other conversions.</p>
2. Explain basic science in the field of study including simple machine.	<p>Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat &amp; temperature, force, motion, pressure, heat treatment, centre of gravity, friction.</p> <p>Explain levers and its types.</p> <p>Explain relationship between Efficiency, velocity ratio and Mechanical Advantage.</p> <p>Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.</p> <p>Solve simple problems on lifting tackles like crane- Solution of problems with the aid of vectors.</p>
<b>ENGINEERING DRAWING</b>	
1. Read and apply engineering	Read & interpret the information on drawings and apply in executing practical work.

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drawing for different application in the field of work.	Read &analyse the specification to ascertain the material requirement, tools and assembly/maintenance parameters.
	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.

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Title/Name of qualification/component: MARINE ENGINE FITTER		Level: 4	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Process	<p><b>Familiar, Predictable, Routine Situations of Clear Choice</b></p> <ul style="list-style-type: none"> <li>• Perform dismantling &amp; assembling of multi-cylinder marine engine as per Makers' manual and check functionality.</li> <li>• Overhaul Oil pump, Filters, Radiator, Cooling system and check functionality.</li> <li>• Check the cooling &amp; lubrication system and conduct necessary maintenance as per requirement.</li> </ul>	<p>In all the learning outcomes for example 'Perform dismantling &amp; assembling of multi-cylinder marine engine as per Makers' manual and check functionality ', 'Overhaul Oil pump, Filters, Radiator, Cooling system and check functionality' and 'Check the cooling &amp; lubrication system and conduct necessary maintenance as per requirement ', the learner will be required to choose appropriate tools, equipments, procedures as per the requirement of the job. This work will be done within familiar, predictable and routine situations to achieve the tolerance levels and accuracy demanded as per the job.</p> <p>Thus the learner requires demonstrating ability to work in familiar, predictable, routine, situation of clear choice.</p>	4

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Title/Name of qualification/component: MARINE ENGINE FITTER		Level: 4	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
		Hence the NSQF level as per this descriptor will be 4.	
Professional knowledge	<p><b>Factual Knowledge of field of Knowledge or study</b></p> <ul style="list-style-type: none"> <li>• Engine bearing - classification and location - material used. Composition of bearing materials - shell bearing and their advantages.</li> <li>• Cylinder liners – construction &amp; purpose – material used and finish provided types of liners in use.</li> </ul>	<p>The learner is expected to possess knowledge about classification and location - material used for engine bearing; shell bearing and their advantages etc. He/she should know about the construction &amp; purpose of Cylinder liners, description &amp; operation of Air compressor, turbo chargers and common troubles faced and its rectification etc.</p> <p>The learner also demonstrates knowledge about need for cooling an engine general, cooling used</p>	4

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Title/Name of qualification/component: MARINE ENGINE FITTER		Level: 4	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
	<ul style="list-style-type: none"> <li>Need for cooling an engine general; description &amp; types of air and water.</li> <li>Description &amp; operation of Air compressor, turbo chargers and common troubles &amp; maintenance.</li> </ul>	<p>in engine – layout of cooling system and function of parts like radiator, need for lubrication system for diesel engines etc.</p> <p>The above knowledge possessed by the learner are the factual knowledge of this field of work or study.</p> <p>Hence NSQF Level 4 for this Descriptor.</p>	
Professional skill	<ul style="list-style-type: none"> <li>Measure and test Electrical / Electronics circuits/ components and check performance.</li> <li>Diagnosis engine faults Erect&amp; Install Engines and ensure functionality.</li> <li>Plan and organize the work to make job as per specification applying different types of basic fitting operation and check for dimensional accuracy. [Basic fitting operation: marking, hack sawing, chipping, filing, drilling, Tapping.</li> </ul>	<p>In learning outcomes such as ‘Measure and test Electrical / Electronics circuits/ components and check performance’ and ‘Diagnosis engine faults Erect&amp; Install Engines and ensure functionality’, the learner is expected to recall and demonstrate practical skills and make use of appropriate rules and tools. The nature of work performed by the learner are repetitive in narrow range of application,. routine type.</p> <p>Hence NSQF Level 4 for this Descriptor.</p>	4

## NSQF QUALIFICATION FILE

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Title/Name of qualification/component: MARINE ENGINE FITTER		Level: 4	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Core skill	<p><b>Language to communicate written or oral, with required clarity</b></p> <ul style="list-style-type: none"> <li>Interpret &amp; use formal and technical communication.</li> </ul> <p><b>Basic Arithmetic and algebraic principles</b></p> <ul style="list-style-type: none"> <li>Read and apply basic engineering drawing for different application in the field of work.</li> </ul> <p><b>Basic Understanding of social/political</b></p> <ul style="list-style-type: none"> <li>Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.</li> </ul>	<p>The work of Marine Engine Fitter involves dismantling &amp; assembling of multi-cylinder marine engine, overhauling of Oil pump, Filters, Radiator, Cooling system and check functionality etc which requires skill of basic arithmetic &amp; algebraic principles in order to understand the work enlisted in the job card/service card and use the measuring &amp; marking tools. The learner will also need to communicate with team supervisor to understand the job and explain ones work.</p> <p>The learner will also need to have basic understanding of social political and natural environment as mentioned in the learning outcome for example 'Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources'.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	4

## NSQF QUALIFICATION FILE

Approved in 24<sup>th</sup> NSQC Dated 27<sup>th</sup> Feb, 2020

Title/Name of qualification/component: MARINE ENGINE FITTER		Level: 4	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Responsibility	<ul style="list-style-type: none"> <li>Demonstrate different joining operations observing standard procedure. [Different joints – bolt joints, riveting, gas welding arc welding, brazing, lock nut, cotter split pin etc.]</li> <li>Maintain shop floor tools &amp; Equipments as per standard procedure.</li> <li>Overhaul air compressor, turbo charger and perform Gas charging &amp; leak Testing of engine refrigeration.</li> </ul>	<p>The role of Marine Engine Fitter is to perform the work as per specifications and apply their own analysis of what needs to be done based on their understanding of detection of engine faults and rectification, installation of Engines and ensure functionality, measure and test electrical / electronic circuits/ components etc.</p> <p>Here the learner is responsible for his own quality work and learning to ensure the conformance of given job requirements.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	4



**NSQF QUALIFICATION FILE****Approved in 24<sup>th</sup> NSQC Dated 27<sup>th</sup> Feb, 2020****SECTION 3****EVIDENCE OF NEED**

26	<p><b>What evidence is there that the qualification is needed? What is the estimated uptake of this qualification and what is the basis of this estimate?</b></p> <table border="1" data-bbox="339 521 1390 1666"> <thead> <tr> <th data-bbox="339 521 627 663"><b>Basis</b></th> <th data-bbox="627 521 1390 663"><b>In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="339 663 627 1043">Need of the qualification</td> <td data-bbox="627 663 1390 1043"><b>Capital Goods and Manufacturing</b> Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labor intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.</td> </tr> <tr> <td data-bbox="339 1043 627 1469">Industry Relevance</td> <td data-bbox="627 1043 1390 1469">The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/NSTIs/MSTIs/BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.</td> </tr> <tr> <td data-bbox="339 1469 627 1597">Usage of the qualification</td> <td data-bbox="627 1469 1390 1597">The Proposed qualification will create skilled Technician for various establishments in different Sectors.</td> </tr> <tr> <td data-bbox="339 1597 627 1666">Estimated uptake</td> <td data-bbox="627 1597 1390 1666">The present seating capacity is 420.</td> </tr> </tbody> </table>	<b>Basis</b>	<b>In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</b>	Need of the qualification	<b>Capital Goods and Manufacturing</b> Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labor intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.	Industry Relevance	The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/NSTIs/MSTIs/BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.	Usage of the qualification	The Proposed qualification will create skilled Technician for various establishments in different Sectors.	Estimated uptake	The present seating capacity is 420.
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27	<p><b>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences.</b></p> <p>The qualification originally designed for Craftsman Training Scheme is in existence for many years and approved by DGT (Regulatory Body) under Ministry of Skill Development and Entrepreneurship, Govt. of India.</p>										

**NSQF QUALIFICATION FILE**

**Approved in 24<sup>th</sup> NSQC Dated 27<sup>th</sup> Feb, 2020**

28	<p><b>What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF? Give justification for presenting a duplicate qualification</b></p> <p>The qualification is originally designed and approved by DGT for the Craftsman Training Scheme and is in existence for many years. No such duplicate qualification of same duration and competencies exists.</p>
29	<p><b>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? Specify the review process here</b></p> <ul style="list-style-type: none"> <li>• The research wing of CSTARI &amp; DGT reviews and updates the qualification, in consultation with industries and other stakeholders, on a regular basis by conducting trade committee meetings.</li> <li>• DGT will monitor any duplicity by comparing existing qualifications with upcoming ones in the National Qualifications Register (NQR) and relevant sectors.</li> </ul>

**SECTION 4**

**EVIDENCE OF PROGRESSION**

**30** **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? Show the career map here to reflect the clear progression**

On completion of the training the trainee will have an opportunity to move in vertical/horizontal pathways to promote to higher designations. The learner can further undergo other specialised courses to excel in the relevant field.

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    graph LR
      A[Technician] --> B[Senior Technician]
      B --> C[Supervisor]
      C --> D[Manager]
      B --> E[Entrepreneur]
  
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