

# QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR TELECOM INDUSTRY

## What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

**Contact Us:** 2nd Floor,  
Plot No:- 105, Sector 44  
Road, Kanahi, Haryana  
122003  
**Phone:** 0124 4148029



## Contents

1. Introduction and Contacts.....	1
2. Qualifications Pack.....	2
3. Glossary of Key Terms .....	3
4. OS Units.....	5
5. Assessment Criteria .....	25

## Introduction

### Qualifications Pack- Telecom Board Bring-Up Engineer

**SECTOR:** TELECOM

**SUB-SECTOR:** HANDSET

**OCCUPATION:** BOARD BRING UP ENGINEER

**REFERENCE ID:** TEL/Q2302

**ALIGNED TO:** NCO-2015/3114.1401

**Telecom Embedded Hardware Developer** will deal with techniques, and tools involved in assembly and maintenance of telecom embedded hardware systems and products.

**Brief Job Description:** This unit is about dealing with industry standard practices, flows and tools involved in assembly, test, debug, and enablement of Telecom Hardware boards and make them ready for system integration and commissioning.

**Personal Attributes:** This job requires the individual to be analytical and be able to handle high-pressure situations to successfully perform the assigned responsibilities. He should have basic electronic components, tools, written and oral communication skills and should be able to apply practical judgment to successfully perform the assigned responsibilities.

Job Details	Qualifications Pack Code	TEL/Q2302		
	Job Role	Telecom Board Bring-Up Engineer <i>This job role is applicable in both national and international scenarios</i>		
	Credits (NSQF)	TBD	Version number	1.0
	Sector	Telecom	Drafted on	08/01/2015
	Sub-sector	Handset	Last reviewed on	29/04/2015
	Occupation	Board Bring-Up	Next review date	14/05/2017
	NSQC Clearance on	20/07/2015		

Job Role	Telecom Board Bring-Up Engineer
Role Description	Board Bring-Up Engineer with industry standard practices, flows and tools involved in enablement of Hardware boards
NSQF level	3
Minimum Educational Qualifications*	10 <sup>th</sup> pass
Maximum Educational Qualifications*	Bachelor in Technology (Electronics, Electrical, Instrumentation, Computer, Telecom)
Training (Suggested but not mandatory)	Training on Basic electronic components Training on PCB Assembly, Testing and Debug Training on Firmware Flashing, Code Flow Testing
Minimum Job Entry Age	14 Years
Experience	0-2 years of work experience in pcb assembly and testing
Applicable National Occupational Standards (NOS)	<p><b>Compulsory:</b></p> <ol style="list-style-type: none"> <li>1. TEL/N 2307 (<a href="#">Telecom PCB Assembly and Testing</a>)</li> <li>2. TEL/N 2308 (<a href="#">Hardware-Software Bring-Up</a>)</li> <li>3. TEL/N 2309 (<a href="#">Telecom PCB Repair and Maintenance</a>)</li> <li>4. TEL/N4121 (<a href="#">Maintain a Healthy, Safe and Secure Working Environment</a>)</li> </ol> <p><b>Optional:</b> N.A.</p>
Performance Criteria	As described in the relevant OS units

Definitions	Keywords /Terms	Description
	Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
	Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components
	Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
	Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
	Job Role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
	OS	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
	Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
	NOS	NOS are Occupational Standards which apply uniquely in the Indian context.
	Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
	Qualifications Pack	Qualifications Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A qualifications Pack is assigned a unique qualification pack code.
	Unit Code	Unit Code is a unique identifier for an Occupational Standard, which is denoted by an 'N'.
	Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
	Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
	Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
	Organizational Context	Organizational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.

Acronyms

Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills or Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
<b>Keywords /Terms</b>	<b>Description</b>
PCB	Printed Circuit Board
KPI	Key Performance Indicator
OHS	Organizational Health & Safety
BOM	Bill of Material
SHE	Safety, Health & Environment
SLA	Service Level Agreement
CRO	Cathode Ray Oscilloscope
RLC	Resistance Inductance And Capacitance

# National Occupational Standard

## Overview

This unit is about dealing with industry standard practices, flows and tools involved in assembly, test, and debug of Printed Circuit Boards for Telecom Products.

TEL/N2307

Telecom PCB Assembly and Testing

National Occupational Standard	<b>Unit Code</b>	TEL/N2307
	<b>Unit Title (Task)</b>	Telecom PCB Assembly and Testing
	<b>Description</b>	This OS unit is industry standard practices, flows and tools involved in assembly, test and debug of Printed Circuit Board
	<b>Scope</b>	This unit/task covers the following: <b>Telecom Printed Circuit Board (PCB):</b> <ul style="list-style-type: none"> <li>• assembly</li> <li>• tools</li> <li>• interfaces and protocols</li> </ul> <b>Test and Debug:</b> <ul style="list-style-type: none"> <li>• PCB test procedures</li> <li>• fault detection</li> </ul>
	<b>Performance Criteria(PC) w.r.t. the Scope</b>	
	<b>Element</b>	<b>Performance Criteria</b>
	<b>Telecom Printed Circuit Board (PCB)</b>	Competent user/individual on the job must be able to: PC1. use PCB test plans provided by development team PC2. construct jigs and fixtures for bare boards PC3. correlate BOM required for PCB assembly with actual components PC4. follow standard soldering practices  PC5. read PCB schematics and PCB layouts  PC6. operate equipment used for assembly and testing of PCB board
	<b>Test and Debug</b>	Competent user/individual on the job must be able to: PC7. interpret test plans and procedures PC8. perform tests for communication interfaces and protocols PC9. perform functional, electrical and parametric testing of assembled PCB PC10. do fault detection and repair of PCB
	<b>Knowledge and Understanding (K)</b>	
	<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant legislation, standards, policies, and procedures followed in the company KA2. how to engage with both internal and external specialists for support in order to resolve incidents and service requests KA3. service request procedures, tools, and techniques

TEL/N2307

**Telecom PCB Assembly and Testing**

<b>B. Technical Knowledge</b>	The user/individual on the job needs to know and understand: KA4. basics of electronic components and equipment KA5. product technical specifications KA6. PCB assembly and test techniques KA7. various hardware testing techniques
<b>Skills (S) [Optional]</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to: SA1. prepare and submit reports on progress and status of all testing procedures SA2. prepare high quality test case documents SA3. fill up record sheets clearly, concisely and accurately as per company procedures SA4. write memos and e-mail to customers, co-workers, and vendors to provide them with work updates and to request appropriate information without English language errors regarding grammar or sentence construct
	<b>Reading Skills</b>
	The user/individual on the job needs to know and understand how to: SA5. extract and read Bill of Material (BOM) SA6. read Test plans and procedures SA7. read PCB schematics and layouts
	<b>Oral Communication (Listening and Speaking skills)</b>
	The user/individual on the job needs to know and understand how to: SA8. discuss task lists, schedules, and work-loads with co-workers SA9. question customers appropriately in order to understand the nature of the problem and make a diagnosis SA10. give clear instructions to customers SA11. keep customers informed about progress SA12. avoid using jargon, slang or acronyms when communicating with a customer, unless it is required
<b>B. Professional Skills</b>	<b>Decision Making</b>
	The user/individual on the job needs to know and understand how to: SB1. make decisions pertaining to the concerned area of work
	<b>Plan and Organize</b>
	The user/individual on the job needs to know and understand: SB2. plan and organize service feedback files/documents
	<b>Customer Centricity</b>
The user/individual on the job needs to know and understand how to: SB3. manage relationships with customers who may be stressed, frustrated, confused, or angry SB4. build customer relationships and use customer centric approach	

TEL/N2307

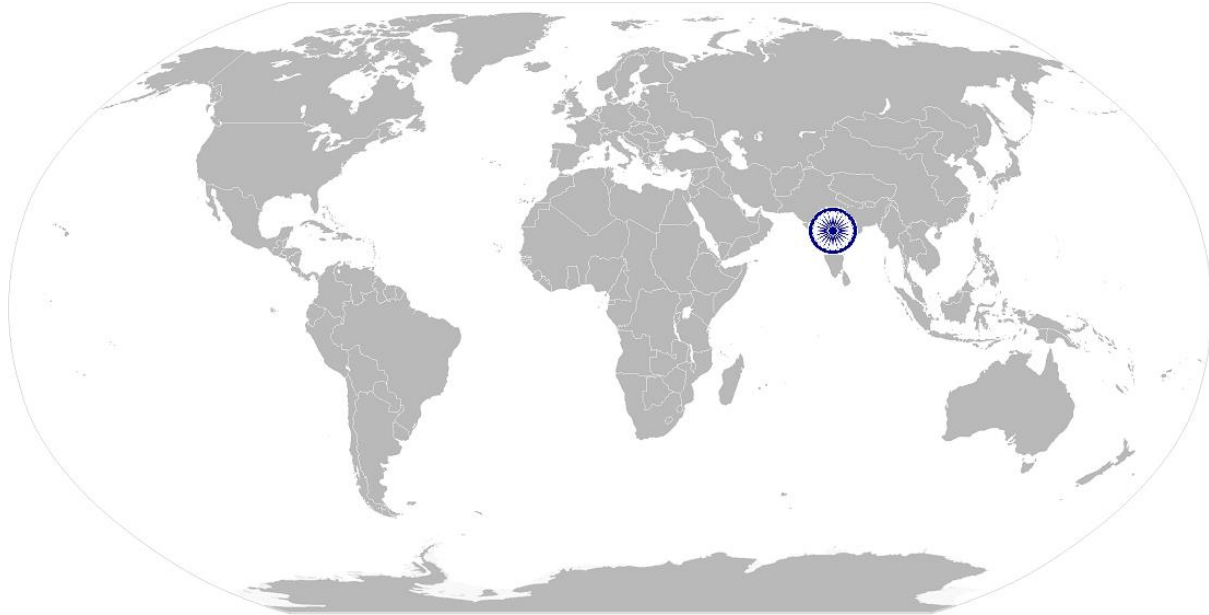
**Telecom PCB Assembly and Testing**

	<b>Problem Solving</b>
	The user/individual on the job needs to know and understand how to: SB5. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB6. deal with clients lacking the technical background to solve the problem on their own SB7. identify immediate or temporary solutions to resolve delays
	<b>Analytical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB8. use the existing data to arrive at specific data points SB9. use the existing data points for improving the call resolution time SB10. use the existing data points to generate required reports for business
	<b>Critical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB11. apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action





# National Occupational Standard



## Overview

This unit is about dealing with industry standard practices, flows and tools involved in enablement of hardware and software on telecom product boards and make them ready for system integration and commissioning.

TEL/N2308

Hardware-Software Bring-Up

National Occupational Standard

<b>Unit Code</b>	TEL/N2308
<b>Unit Title (Task)</b>	Hardware-Software Bring-Up
<b>Description</b>	This OS unit is industry standard practices, flows and tools involved in enablement of hardware and software on telecom product boards and make them ready for system integration and commissioning.
<b>Scope</b>	This unit/task covers the following: <b>Hardware Validation:</b> <ul style="list-style-type: none"> <li>operate validation tools</li> <li>enable hardware</li> </ul> <b>Software Validation:</b> <ul style="list-style-type: none"> <li>operate validation tools</li> <li>enable firmware</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Hardware Validation</b>	PC1. develop or Implement hardware validation methodology for a board PC2. operate tools used in hardware board bring-Up PC3. test set-ups for hardware validation of telecom boards PC4. undertake tasks related to functional, parametric, electrical & environmental tests
<b>Software Validation</b>	PC5. develop or Implement software validation methodology for a board PC6. operate tools used in software bring-up PC7. flash firmware codes & download FPGA image PC8. ensure use case & what-if scenario testing
<b>Knowledge and Understanding (K)</b>	
<b>B. Organizational Context</b> (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant legislation, standards, policies, and procedures followed in the company KA2. how to engage with both internal and external specialists for support in order to resolve incidents and service requests KA3. service request procedures, tools, and techniques
<b>B. Technical Knowledge</b>	The user/individual on the job needs to know and understand: KB1. product technical specifications KB2. hardware & software validation processes & methodology KB3. hardware and software tools used in board validation and enablement

TEL/N2308

Hardware-Software Bring-Up

Skills (S) [Optional]	
<b>C. Core Skills/ Generic Skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to: SA1. prepare and submit reports on progress and status of all repair and testing procedures SA2. fill up record sheets clearly, concisely and accurately as per company procedures
	<b>Reading Skills</b>
	The user/individual on the job needs to know and understand how to: SA1. read test plans and procedures SA2. read PCB schematics and layouts
	<b>Oral Communication (Listening and Speaking skills)</b>
	The user/individual on the job needs to know and understand how to: SA3. clearly communicate relevant information to supervisors SA4. respond appropriately to queries SA5. communicate with customer/customer facing teams to understand handset performance issues SA6. communicate in the local language SA7. convey proposed solution to the customers
	<b>D. Professional Skills</b>
The user/individual on the job needs to know and understand how to: SB1. make decisions pertaining to the concerned area of work	
<b>Plan and Organize</b>	
The user/individual on the job needs to know and understand: SB2. plan and organize service feedback files/documents	
<b>Customer Centricity</b>	
The user/individual on the job needs to know and understand how to: SB3. manage relationships with customers who may be stressed, frustrated, confused, or angry SB4. build customer relationships and use customer centric approach	
<b>Problem Solving</b>	
The user/individual on the job needs to know and understand how to: SB5. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB6. deal with clients lacking the technical background to solve the problem on their own SB7. identify immediate or temporary solutions to resolve delays	

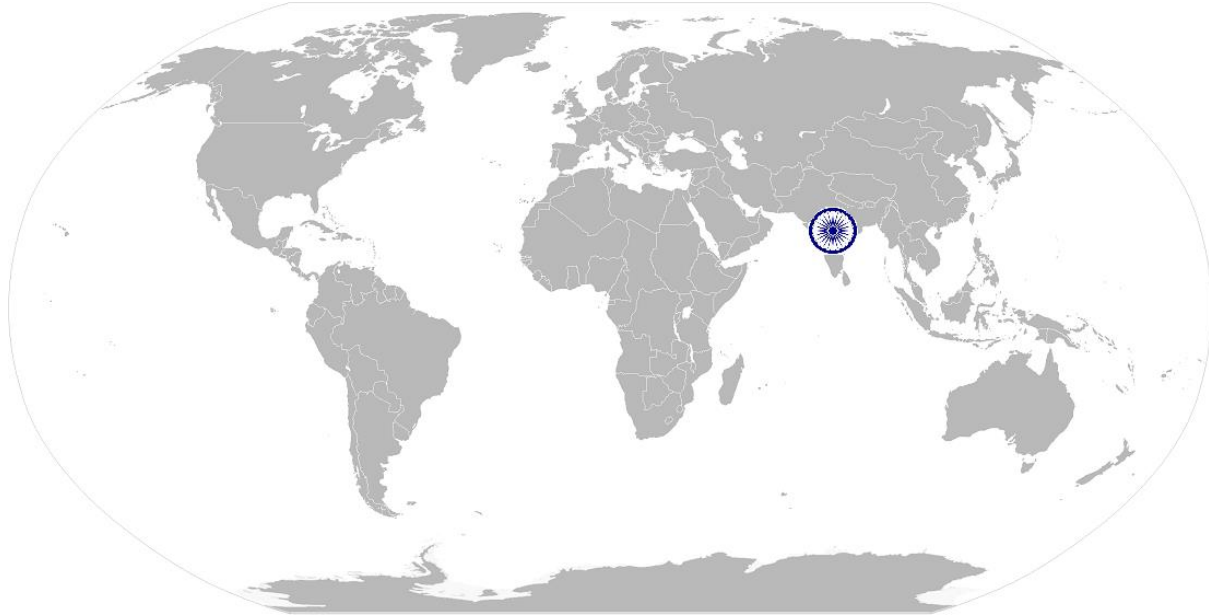
TEL/N2308

Hardware-Software Bring-Up

	<b>Analytical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB8. use the existing data to arrive at specific data points SB9. use the existing data points for improving the call resolution time SB10. use the existing data points to generate required reports for business
	<b>Critical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB11. apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action



# National Occupational Standard



## Overview

This unit is about dealing with industry standard practices, flows and tools involved in rework, maintenance and repair of printed circuit boards for telecom products.

TEL/N2309

Telecom PCB Repair and Maintenance

National Occupational Standard	<b>Unit Code</b>	TEL/N 2309
	<b>Unit Title (Task)</b>	Telecom PCB Repair and Maintenance
	<b>Description</b>	This unit is about dealing with industry standard practices, flows and tools involved in rework, maintenance and repair of PCBs.
	<b>Scope</b>	<p>This unit/task covers the following:</p> <p><b>Printed Circuit Board (PCB) Repair and Rework:</b></p> <ul style="list-style-type: none"> <li>• fault isolation</li> <li>• component disassembly</li> <li>• repair</li> <li>• testing</li> </ul> <p><b>Printed Circuit Board (PCB) Maintenance:</b></p> <ul style="list-style-type: none"> <li>• quality assurance</li> <li>• spares</li> <li>• maintenance procedures</li> </ul>
	<b>Performance Criteria(PC) w.r.t. the Scope</b>	
	<b>Element</b>	<b>Performance Criteria</b>
	<b>Printed Circuit Board (PCB) Repair and Rework</b>	<p>PC1. review all the Design supporting documents provided by development team</p> <p>PC2. section wise debugging for fault detection</p> <p>PC3. mark all the faulty sections for disassembly</p> <p>PC4. repair burnt laminate, solder mask damage, and connector</p> <p>PC5. add wires to test the circuit and debug faults</p> <p>PC6. read PCB schematics and PCB layouts</p> <p>PC7. operate equipment used for repair and rework of PCB board</p>
	<b>Printed Circuit Board (PCB) Maintenance</b>	<p>PC8. ensure best maintenance practice for longer life of equipment</p> <p>PC9. compile list of parts and requisition parts as needed</p> <p>PC10. ensure board quality assurance</p>
	<b>Knowledge and Understanding (K)</b>	
	<b>C. Organizational Context</b> (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant legislation, standards, policies, and procedures followed in the company</p> <p>KA2. how to engage with both internal and external specialists for support in order to resolve incidents and service requests</p> <p>KA3. service request procedures, tools, and techniques</p> <p>KA4. potential helpdesk customers and their typical requirements</p> <p>KA5. role and importance of the helpdesk in supporting business operations</p>
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. basics of electronic components and equipment</p> <p>KB2. product technical specifications</p> <p>KB3. PCB assembly and test techniques</p> <p>KB4. various hardware testing techniques</p>	



TEL/N2309

Telecom PCB Repair and Maintenance

Skills (S) [Optional]	
<b>E. Core Skills/ Generic Skills</b>	<b>Writing Skills</b>
	The user/ individual on the job needs to know and understand how to: SA1. prepare and submit reports on progress and status of all repair and testing procedures SA2. fill up record sheets clearly, concisely and accurately as per company procedures SA3. write memos and e-mail to customers, co-workers, and vendors to provide them with work updates and to request appropriate information without english language errors regarding grammar or sentence construct
	<b>Reading Skills</b>
	The user/individual on the job needs to know and understand how to: SA4. extract and read bill of material (BOM) SA5. read test plans and procedures SA6. read PCB schematics and layouts
	<b>Oral Communication (Listening and Speaking skills)</b>
	The user/individual on the job needs to know and understand how to: SA7. discuss task lists, schedules, and work-loads with co-workers SA8. question customers appropriately in order to understand the nature of the problem and make a diagnosis SA9. give clear instructions to customers SA10. keep customers informed about progress SA11. avoid using jargon, slang or acronyms when communicating with a customer, unless it is required
<b>F. Professional Skills</b>	<b>Decision Making</b>
	The user/individual on the job needs to know and understand how to: SB12. make decisions pertaining to the concerned area of work
	<b>Plan and Organize</b>
	The user/individual on the job needs to know and understand: SB13. plan and organize service feedback files/documents
	<b>Customer Centricity</b>
	The user/individual on the job needs to know and understand how to: SB14. manage relationships with customers who may be stressed, frustrated, confused, or angry SB15. build customer relationships and use customer centric approach

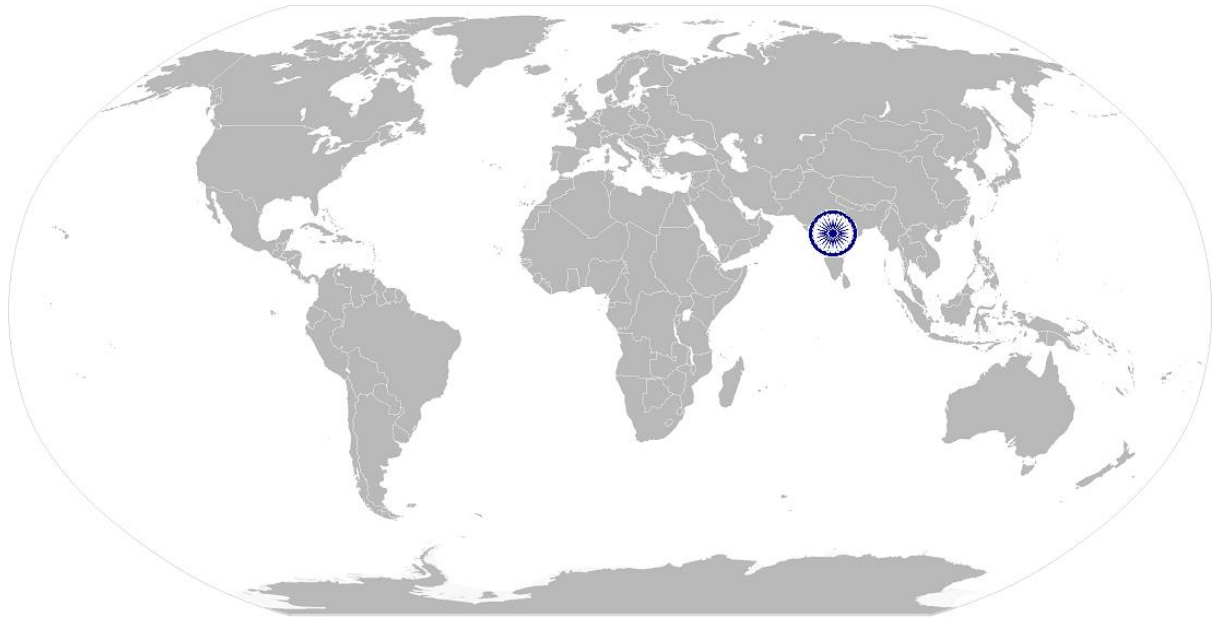
TEL/N2309

Telecom PCB Repair and Maintenance

	<b>Problem Solving</b>
	The user/individual on the job needs to know and understand how to: SB16. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB17. deal with clients lacking the technical background to solve the problem on their own SB18. identify immediate or temporary solutions to resolve delays
	<b>Analytical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB19. use the existing data to arrive at specific data points SB20. use the existing data points for improving the call resolution time SB21. use the existing data points to generate required reports for business
	<b>Critical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB22. apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action



# National Occupational Standard



## Overview

This unit is about monitoring the working environment and making sure it meets requirements for health, safety and security.

TEL/N4121

Maintain a Healthy, Safe and Secure Working Environment

National Occupational Standard

<b>Unit Code</b>	TEL/N2310
<b>Unit Title (Task)</b>	Maintain a healthy, safe and secure working environment
<b>Description</b>	This unit is about monitoring your working environment and making sure it meets requirements for health, safety and security.
<b>Scope</b>	This unit/task covers the following: <b>Emergency procedures:</b> <ul style="list-style-type: none"> <li>• illness</li> <li>• accidents</li> <li>• fires</li> <li>• other reasons to evacuate the premises</li> <li>• breaches of security</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Emergency procedures</b>	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> <li>PC1. ensure that work is carried out in accordance to the level of competence and legal requirements</li> <li>PC2. ensure that sites are assessed for health and safety risk as per company's guidelines prior to commencement of work</li> <li>PC3. ensure environmental conditions and hazards like Earth Potential Rise (EPR) are considered while carrying out the work</li> <li>PC4. identify and correct any hazards that you can deal with safely, competently and within the limits of your authority</li> <li>PC5. report any hazards that you are not competent to deal with to the relevant person in line with organizational procedures and warn other people who may be affected</li> <li>PC6. follow your organization's emergency procedures promptly, calmly, and efficiently</li> <li>PC7. identify and recommend opportunities for improving health, safety, and security to the designated person</li> <li>PC8. complete any health and safety records legibly and accurately</li> </ul>
<b>Knowledge and Understanding (K)</b>	
<b>D. Organizational Context</b> (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> <li>KA1. legislative requirements and organization's procedures for health, safety and security and your role and responsibilities in relation to this</li> <li>KA2. what is meant by a hazard, including the different types of health and safety hazards that can be found in the workplace</li> <li>KA3. how and when to report hazards</li> <li>KA4. limits of your responsibility for dealing with hazards</li> <li>KA5. your organization's emergency procedures for different emergency situations and the importance of following these</li> <li>KA6. the importance of maintaining high standards of health, safety and security</li> <li>KA7. implications that any non-compliance with health, safety and security may</li> </ul>

**TEL/N4121**

**Maintain a Healthy, Safe and Secure Working Environment**

	have on individuals and the organization
<b>B. Technical Knowledge</b>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. different types of breaches in health, safety and security and how and when to report these</p> <p>KB2. evacuation procedures for workers and visitors</p> <p>KB3. how to summon medical assistance and the emergency services, where necessary</p> <p>KB4. how to use the health, safety and accident reporting procedures and the importance of these</p> <p>KB5. government agencies in the areas of safety, health and security and their norms and services</p>
<b>Skills (S) [Optional]</b>	
<b>G. Core Skills/ Generic Skills</b>	<b>Writing Skills</b>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. complete accurate, well written work with attention to detail</p>
	<b>Reading Skills</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA2. read instructions, guidelines, procedures, rules and service level agreements</p>
	<b>Oral Communication (Listening and Speaking skills)</b>
	<p>You need to know and understand how to:</p> <p>SA3. listen effectively and orally communicate information accurately</p>
<b>H. Professional Skills</b>	<b>Decision Making</b>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB23. make decisions on suitable course of action</p>
	<b>Plan and Organize</b>
	<p>The user/individual on the job needs to know and understand:</p> <p>SB24. plan and organize your work to meet health, safety and security requirements</p>

**Maintain a Healthy, Safe and Secure Working Environment**

	<b>Problem Solving</b>
	The user/individual on the job needs to know and understand how to: SB25. apply problem solving approaches in different situations
	<b>Analytical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB26. analyze data and activities
	<b>Critical Thinking</b>
	The user/individual on the job needs to know and understand how to: SB27. apply balanced judgments to different situations
	<b>Attention to Detail</b>
	You need to know and understand how to: SB28. apply good attention to detail SB29. check your work is complete and free from errors SB30. get your work checked by others
	<b>Team Work</b>
You need to know and understand how to: SB31. contribute to the quality of team working SB32. work independently in a team environment SB33. work independently and collaboratively	





### CRITERIA FOR ASSESSMENT OF TRAINEES

**Job Role** Telecom Board Bring-Up Engineer

**Qualification Pack** TEL/Q2302

**Sector Skill Council** Telecom

#### 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 70% in every NOS
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	
		Total Mark (300+100)	Out Of	Theory	Skills Practical
1. TEL/N2307 (Telecom PCB Assembly and Testing)	PC1. use PCB test plans provided by development team	<b>100</b>	10	5	5
	PC2. construct jigs and fixtures for bare boards		10	2	8
	PC3. correlate BOM required for PCB assembly with actual components		4	2	2
	PC4. follow standard soldering practices		10	5	5
	PC5. read PCB schematics and PCB layouts		10	3	7

	PC6. operate equipment used for assembly and testing of PCB board		10	0	10
	PC7. interpret test plans and procedures		10	2	8
	PC8. perform tests for communication interfaces and protocols		10	4	6
	PC9. perform functional testing of assembled PCB electrical and parametric testing for PCB		10	4	6
	PC10. fault detection and repair PCB		16	6	10
		<b>Total</b>	100	33	67
2. TEL/N2308 (Hardware-Software Bring-Up)	PC1. develop or Implement hardware validation methodology for a board		10	5	5
	PC2. operate hardware and software tools used in hardware board bring-up		20	5	15
	PC3. test set-ups for hardware validation of telecom boards		20	10	10
	PC4. undertake tasks related to functional, parametric, electrical & environmental tests	<b>100</b>	10	5	5
	PC5. develop or implement software validation methodology for a board		10	2	8
	PC6. operate tools used in software bring-up on a board		15	5	10
	PC7. flash firmware codes & download FPGA image		5	2	3
	PC8. ensure use case & what-if scenario testing		10	2	8
		<b>Total</b>	100	36	64

3. TEL/N2309 (Telecom PCB Repair and Maintenance)	PC1. review all the design supporting documents provided by development team	<b>100</b>	10	5	5
	PC2. section wise debugging for fault detection		20	5	15
	PC3. mark all the faulty sections for disassembly		10	5	5
	PC4. repair burnt laminate, solder mask damage, and connector		10	5	5
	PC5. add wires to test the circuit and debug faults		10	2	8
	PC6. read PCB Schematics and PCB layouts		10	3	7
	PC7. operate equipment used for repair and rework of PCB board		5	2	3
	PC8. ensure best maintenance practice for longer life of equipment		5	2	3
	PC9. compile list of parts and requisition parts as needed		10	3	7
	PC10. ensure board quality assurance		10	2	8
	<b>Total</b>		100	34	66
3. TEL/N2310 (Maintain a Healthy, Safe and Secure Working Environment)	PC1. ensure that work is carried out in accordance to the level of competence and legal requirements	<b>100</b>	10	6	4
	PC2. ensure that sites are assessed for health and safety risk as per company's guidelines prior to commencement of work		12	6	6
	PC3. ensure environmental conditions and hazards like Earth Potential Rise (EPR) are considered while carrying out the work		15	9	6
	PC4. identify and correct any hazards that you can deal with safely, competently and within the limits of your authority		15	10	5
	PC5. report any hazards that you are not competent to deal with to the relevant person in line with organizational procedures and warn other people who may be affected		12	7	5
	PC6. follow your organization's emergency procedures promptly, calmly, and efficiently		12	6	6

	PC7. identify and recommend opportunities for improving health, safety, and security to the designated person		14	8	6
	PC8. complete any health and safety records legibly and accurately		10	5	5
		<b>Total</b>	100	57	43