

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

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Introduction

Qualifications Pack-ICT Technician

SECTOR : TELECOM

SUB-SECTOR: Network Managed Service

OCCUPATION: Network Operation & Maintenance

REFERENCE ID: TEL/Q6206

ALIGNED TO : NCO-2015/3114.0802

Brief Job Description: Individual in this role is responsible to maintain the ICT Nodes/installations live on 24x7 basis, observe and repair Level-1 faults/issues in installed ICT equipment at site, carry out specified preventive and corrective maintenance procedures and report relevant network incidents to the supervisor in time for information as well as response. ICT or Information & Communication Technology refers to NodeB/eNodeB, IP and TDM transmission equipment, IP and Packet Core switch, Cloud and Data Centre equipment.

Personal Attributes: This job requires the individual to be technically qualified, self-disciplined, assertive, team player, action-orientated, possess analytical skills & problem solving ability, effective communication skills and ability to work under pressure. Individual should be capable of working in remote areas and over the entire geography covered by the network.

Job Details	Qualifications Pack Code	TEL/Q6206		
	Job Role	ICT Technician		
	Credits NSQF	TBD	Version number	1.0
	Sector	Telecom	Drafted on	19-06-2014
	Sub-sector	Network Managed Services	Last reviewed on	21-06-2018
	Occupation	Network Operations & Maintenance	Next review date	31-03-2019
	NSQC Clearance on	18/06/2015		

Job Role	ICT Technician
Role Description	ICT Technician assists ICT Engineer in performing technical activities like maintaining basic site hygiene, Preventive Maintenance, Site Management, Fault Management, Change Management - changes at site location during planned outages and Preventive Maintenance for ICT nodes (Circuit & Packet core nodes, MSC, SGSN, GGSN, MGWs, HLR etc , Transmission nodes, Datacomm nodes, NodeB/ eNodeB). ICT Technician carries out effective site supervision and equipment fault management (identification, localizing & rectification of cable, connectivity and equipment faults).
NSQF level	4
Minimum Educational Qualifications*	10+2 and/or ITI Diploma in Electronics, Computer Science, IT or related fields
Maximum Educational Qualifications*	Graduate in Science/Engineering/Technology - Electronics, Computer Science, IT or related fields
Training (Suggested but not mandatory)	NA
Minimum Job Entry Age	18 Year
Experience	0 year
Applicable National Occupational Standards (NOS)	Compulsory: 1. TEL/N6222 (Site hygiene) 2. TEL/N6223 (Preventive Maintenance) 3. TEL/N6224 (Site Management) 4. TEL/N6225 (Corrective Maintenance at ICT Nodes)
Performance Criteria	As described in the relevant OS units

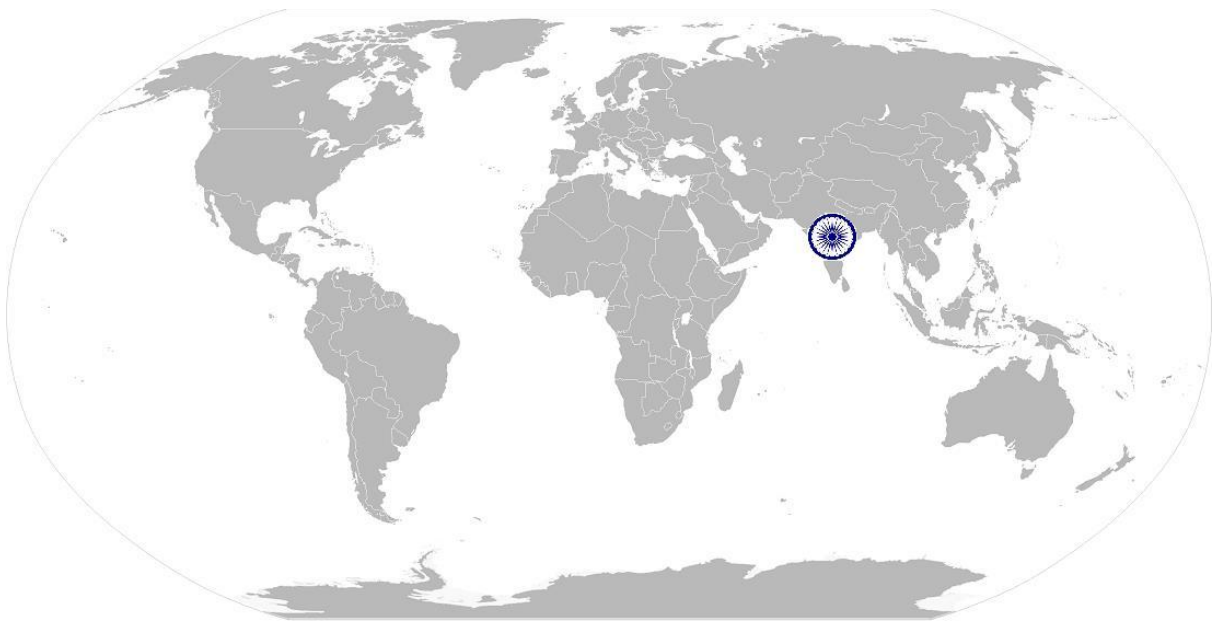
Definitions

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.
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

Acronyms	Keywords /Terms	Description
	Node B	UMTS equivalent to Base Station for 3G systems
	eNode B	Base Station for 4G/ LTE systems. Also known as Evolved Node B or E-UTRAN Node B
	BSC	Base Station Controller
	BSS	Base station subsystem
	BTS	Base Transceiver Station
	FTP	File Transfer Protocol
	FM Engineer	Field Maintenance Engineer
	GPRS	General Packet Radio Service
	GGSN	Gateway GPRS Support Node
	HLR	Home Location Register
	IF cable	Intermediate Frequency cable
	IP Network	Internet Protocol Network
	MUX	Multiplexer
	MGW	Media Gateway
	MML	Man-Machine Language
	MSC	Mobile Switching Centre
	MMU	Man-Machine Unit
	OHS	Organizational Health & Safety
	RF Cable	Radio Frequency Cable
	SGSN	Serving GPRS Support Node
	SHE	Safety, Health & Environment
	SDH	Synchronous Digital Hierarchy
	PDH	Plesiochronous digital hierarchy
	SMPS	Switch Mode Power Supply
	VSWR	Voltage Standing Wave Ratio

National Occupational Standard



Overview

This unit is about maintaining site hygiene which requires maintenance of the equipments, mechanical stability, rack layout and power consumption patterns. The candidate co-ordinates with ICT engineer and carry out the assigned tasks in a timely manner.

TEL/ N6222

Site hygiene

National Occupational Standard

Unit Code	TEL/ N6222
Unit Title (Task)	Site hygiene
Description	This OS unit is about maintaining the site hygiene such as maintenance of equipments and other critical aspects such as rack positioning and power consumption patterns.
Scope	This unit/task covers the following: - maintain basic site hygiene - maintain the right documentation about site layout, equipment, racks etc - maintain the right escalation matrix in case of emergency
Performance Criteria(PC) w.r.t. the Scope:	
Element	Performance Criteria
	To be competent, the user/individual on the job must be able to: PC1. maintain site hygiene of ICT equipment, as per organization's norms PC2. check placement and mechanical stability of equipment racks at the ICT site PC3. check power consumption pattern and report any unusual consumption to supervisor PC4. maintain the escalation matrix in case of emergency PC5: maintain the list of equipment, Rack etc PC6: prioritize and execute tasks in a high-pressure environment
Knowledge and Understanding	
A. Organizational Context (Knowledge of the company / organization & its process relevant to area of responsibilities)	The user/individual on the job needs to know and understand: - KA1. checklists for preventive maintenance and site hygiene - KA2. asset layout as per company standards - KA3. process for handling equipments & reporting process - KA4. environmental & Quality check - KA5. risk and impact of not following defined procedures/work instructions - KA6. escalation matrix for reporting identified incidents, troubles and/ or emergencies e.g. system failures ,fire and power failures - KA 7. the weight, size requirement of the equipments - KA8. power consumption of installed equipment - KA9. asset layout as per company standards

TEL/ N6222

Site hygiene

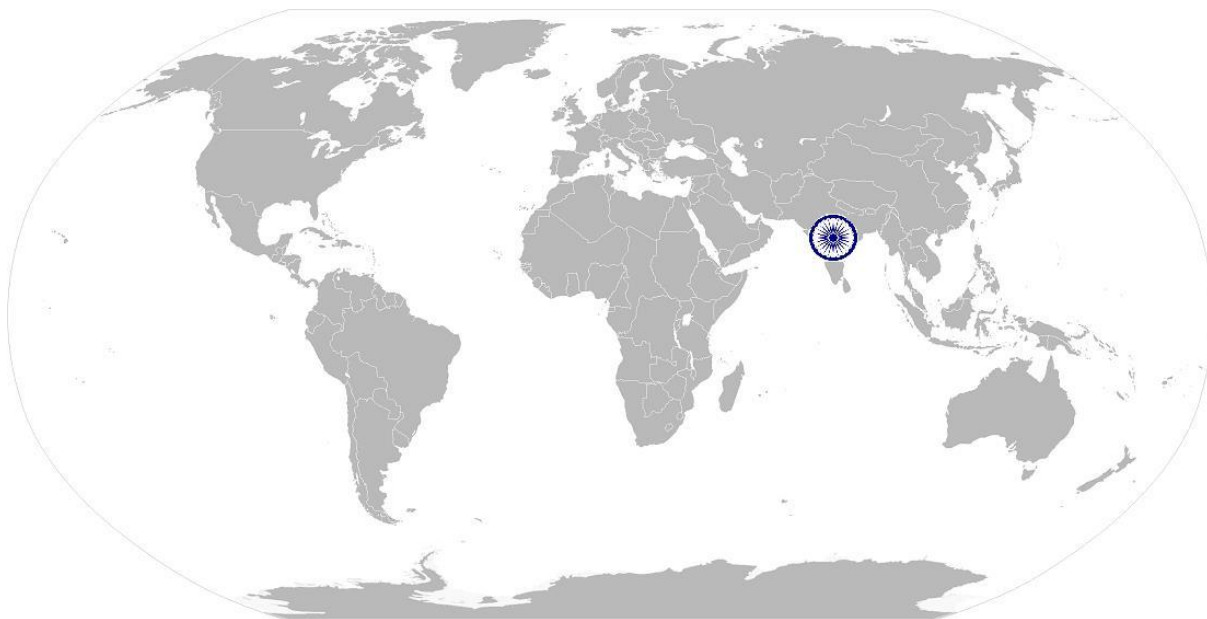
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1.basic use of ICT equipment as given below KB2.knowledge of IP standard & protocols like OSI Layer, Number system, Ethernet Standards KB3.knowledge of GSM,3G Technology KB4.knowledge of SDH & DWDM technology KB5:knowledge of Cloud Computing technology, its building blocks KB6.how to calculate power cost and site up-time KB7.safety requirements at the ICT site able connectors etc
Skills (S)	
A. Core Skills/ Generic Skills	The user/ individual on the job should be to: SA1. having skills to provide advice and guidance to peers & juniors SA2. ability to liaise with third party vendors SA3. communicate with supervisor SA4. ability to communicate in the local language SA5. understand the various Alarm codes, as per company's nomenclature.
B. Domain Specific Skills	Technical skills The user/ individual on the job should : SB1. equipment installtion of BTS, NodeB, Router, Transmission equipment like SDH, DWDM SB2. work on ICT nodes login applications like Secure CRT, Hyper terminal etc.

TEL/ N6222

Site hygiene

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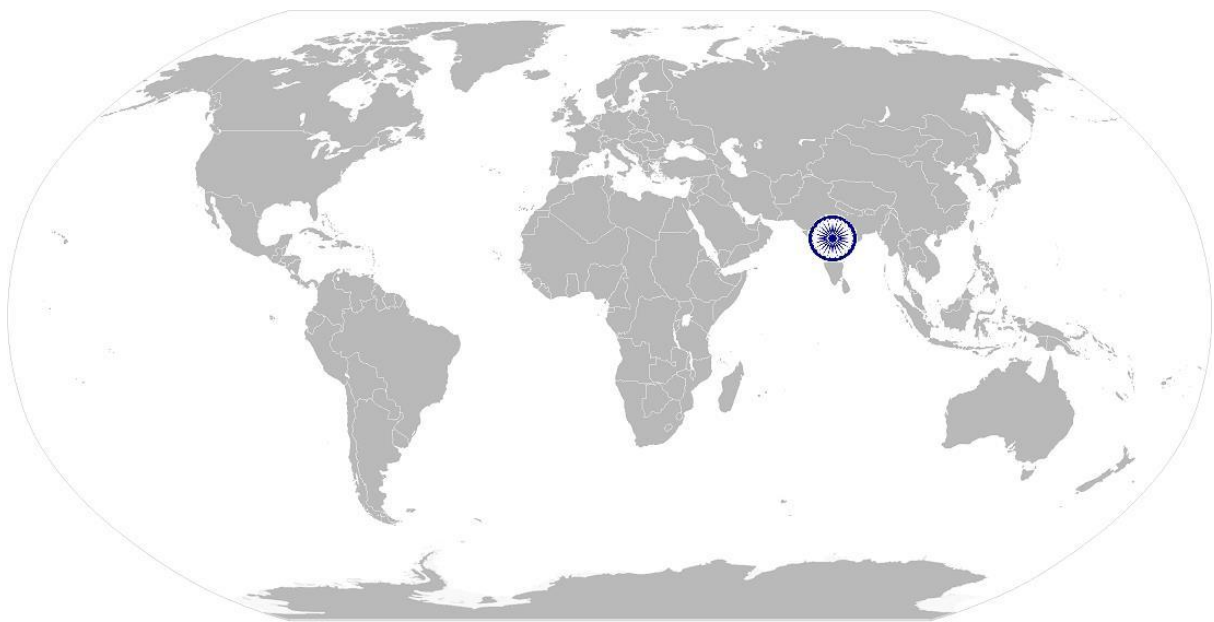
NOSCode	TEL/N6222		
Credits NSQF	TBD	Version number	1.0
Industry	Telecom	Drafted on	19-06-2014
Industry Sub-sector	Network Managed Service	Last reviewed on	21-06-2018
Occupation	Network O&M	Next review date	31-03-2019



TEL/ N6223

Preventive maintenance at ICT Node

National Occupational Standard



Overview

This unit is about performing Preventive Maintenance at ICT sites by obtaining maintenance schedule from the supervisor. This unit explains how to perform health checkups of the site.

TEL/ N6223

Preventive maintenance at ICT Node

National Occupational Standard

Unit Code	TEL/N6223
Unit Title (Task)	preventive maintenance
Description	This unit is about carrying out regular preventive maintenance activities at ICT nodes to ensure their optimal working.
Scope	This unit/task covers the following: 1. ensure preventive maintenance activities at the ICT site 2. checking the health of the site by performing repair and maintenance. 3. ensuring all the optimal requirements are met.
Performance Criteria(PC) w.r.t. the Scope:	
Element	Performance Criteria
	To be competent, the user/individual on the job must be able to: PC1. obtain the preventive maintenance schedule from the supervisors and adhere to the same PC2. keep a check on site up-time and make the logs PC3. notify the network operations center (NOC) or supervisor as per the laid plan prior to undertaking the maintenance work as per the schedule PC4. perform health check on site like checking power etc PC5: document the work done & prepare a report along with ICT Engineer/ NOC
Knowledge and Understanding	
A. Organizational Context (Knowledge of the company/ organization & its processes)	The user/individual on the job needs to know and understand: KA1. pm(preventive maintenance) as per the company norms/industry standards KA2. site up-time targets of the company, to avoid penalties KA3. repair and maintenance guidelines of the company KA4. clear notification matrix in case of preventive maintenance KA5. power requirement of site and equipments

TEL/ N6223

Preventive maintenance at ICT Node

B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. pm schedule of ICT equipment for Fan try cleaning etc KB2. the basic use and care of power checking tools and mechanical equipment KB3. safety hazards and perform duties in a safe manner KB4. knowledge of Manuals and ability to refer them KB5. use of Laptop and how to connect to equipment
Skills (S)	
A. Core Skills/ Generic Skills	Personal skills – Communication The user/ individual on the job need to know and understand how to: SA1. read and comprehend company policies and guidelines to conduct timely preventive maintenance activities SA2. comprehend formats and checklists to verify PM (preventive maintenance) SA3. follow the Notification matrix in case of PM
B. Domain specific skills	Technical skills The user/ individual on the job should: SB1. login to the equipment using relevant cables (RJ45, RS232, Hi Speed USB) for different ICT site equipment SB2. work on ICT nodes login applications like Secure CRT, Hyper terminal etc. SB3. understanding of physical and logical redundancy SB4. undertake standard logical and physical maintenance tasks for the ICT nodes Fault diagnostics and handling The user/ individual on the job should : SB5. perform standard ICT Fault-finding (troubleshooting) techniques and functioning of test equipment SB6. understand alarm coding and interpret fault type SB7. conduct physical maintenance tasks like checking temperatures, fan working condition, earthing, equipment grounding, distribution of cables etc SB8. conduct logical maintenance tasks like checking alarm status, system availability parameters, logical redundancy etc.

TEL/ N6223

Preventive maintenance at ICT Node

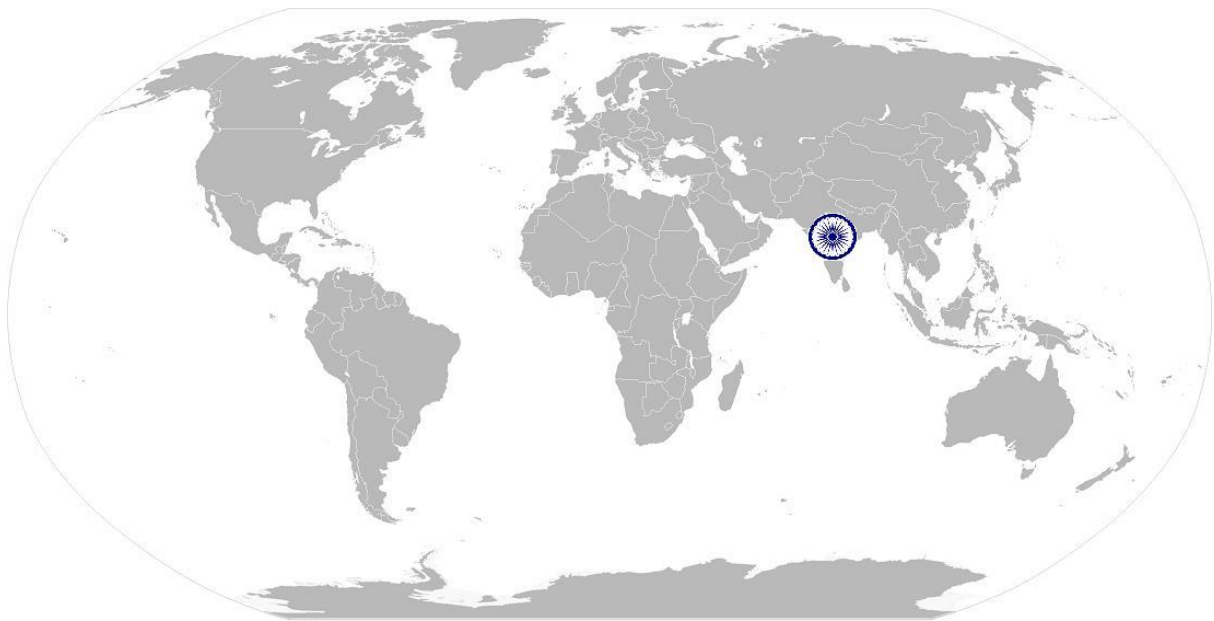
NOS Version Control:

NOS Code	TEL/N6223		
Credits NSQF	TBD	Version number	1.0
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Industry Sub-sector	Network Managed Service	Last reviewed on	21-06-2018
Occupation	Network O&M	Next review date	31-03-2019



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National Occupational Standard



Overview

This unit is about Site management such as ensuring closure of alarms within the SLA while coordinating with the superiors.

TEL/N6224

Site Management

National Occupational Standards	Unit Code	TEL/N6224
	Unit Title (Task)	Site management
	Description	This unit is about carrying out site management at ICT nodes to ensure network availability and their optimal working.
	Scope	This unit/task covers the following: 1. operational maintenance of the site 2. ensuring alarms generated at the site are attended with in the SLA. 3. co-ordinate and assist the superiors to maintain the timelines.
	Performance Criteria(PC) w .r.t. the Scope:	
	Element	Performance Criteria
		To be competent, the user/individual on the job must be able to: PC1. receive change requests from the Configuration Management team or the NOC PC2. identify criticality, and timelines for carrying out the changes with ICT engineer and NOC PC3.assist to ICT Engineer in developing work plan and identify dependencies PC3.check number of alarms active at the site PC4.attend alarms within the defined SLA(Service level Acknowledgments)
Knowledge and Understanding		
A. Organizational Context (Knowledge of the company/ organization & its process relevant to area of responsibilities)		The user/individual on the job needs to know and understand: KA1. risk and impact of not following defined procedures/work instructions KA2. escalation matrix for reporting identified incidents, troubles and/ or emergencies e.g. system failures, fire and power failures KA3. clearances/ regulatory approvals that are required prior to carrying out the installation work KA4. types of documentation in organization and importance of the same KA5. records to be maintained and implications of non-maintenance of the same KA6. knowledge of spare management and repair & return process for fault equipment KA7. SHE and OHS guidelines and regulations as per company's norms KA8. first aid requirements in case of electrical shocks, cuts, fall and other common injuries KA9. electrical and chemical, environmental related hazards and precautionary measures

TEL/N6224

Site Management

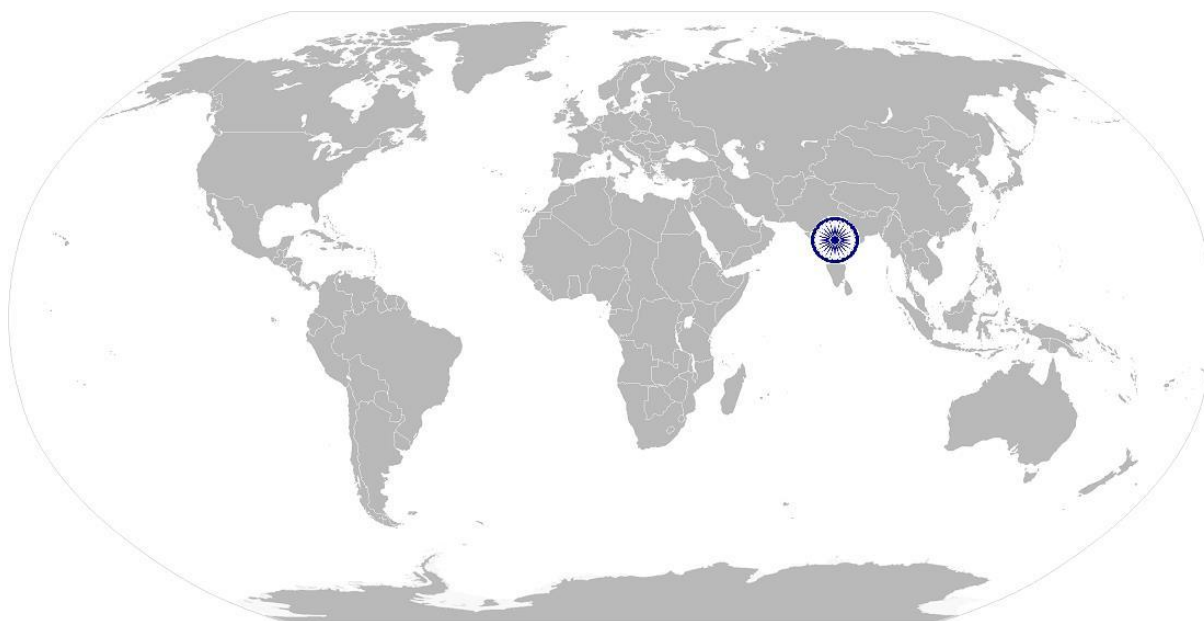
B .Technical Knowledge (To accomplish specific designated responsibilities)	The user/individual on the job needs to know and understand: KB1. functional knowledge of all installed ICT equipment KB2. login process of ICT equipments KB3: basic knowledge of ICT technologies as given below KB4. knowledge of IP standard & protocols like OSI Layer, Number system, Ethernet Standards KB5. knowledge of GSM,3G Technology KB6. knowledge of SDH & DWDM technology KB7: knowledge of Cloud Computing technology, its building blocks KB8. knowledge of Fault Rectification & Alarm handling Process & Manuals and ability to refer them KB9. knowledge of special tools and equipment used for system repairs K10. Use of Laptop and how to connect to equipment
Skills (S)	
A. Domain specific skills	Planning and Execution
	The user/individual on the job to: SA1. Prioritize activities to effectively manage the ICT site
	Technical skills The user/ individual on the job to: SB1. login to the equipment using relevant cables (RJ45, RS232, Hi Speed USB) for different ICT equipment SB2. ability to work on ICT nodes login applications like Secure CRT, Hyper terminal etc. SB3. ability to work on ICT equipment like Router, Transmission equipment, BTS etc

TEL/N6224

Site Management

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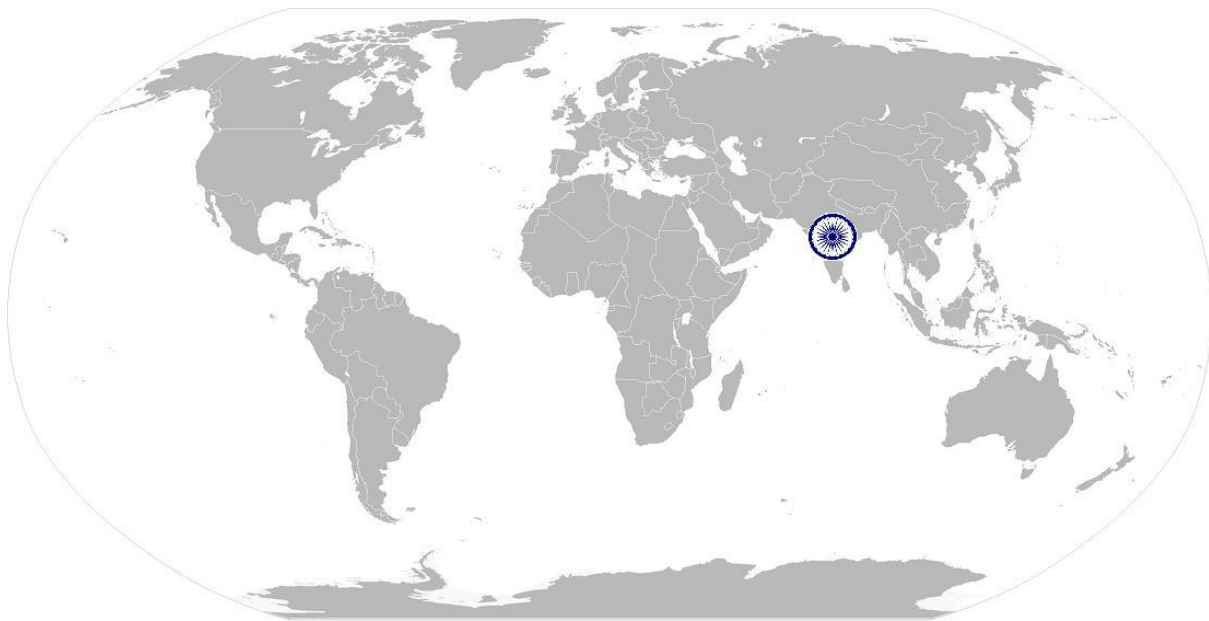
NOS Code	TEL/N6224		
Credits NSQF	TBD	Version number	1.0
Industry	Telecom	Drafted on	19-06-2014
Industry Sub-sector	Network Managed Services	Last reviewed on	21-06-2018
Occupation	Network O&M	Next review date	31-03-2019



TEL/N6225

Corrective maintenance at ICT Nodes

National Occupational Standard



Overview

This unit is about performing corrective maintenance/ Fault management of ICT sites by carrying out diagnostic test and fault rectification procedures.

TEL/N6225

Corrective maintenance at ICT Nodes

National Occupational Standards	Unit Code	TEL/N6225
	Unit Title (Task)	Perform Corrective maintenance/ Fault Management at ICT nodes
	Description	This unit is about carrying out corrective maintenance/ fault management at ICT nodes to ensure network availability and their optimal working.
	Scope	This unit/task covers the following: • Ensure timely response to the network alarms/ trouble tickets • Carry out diagnostic tests at site location and identify root cause of fault • Rectify fault condition or escalate in case additional technical support is required • Follow the escalation matrix
	Performance Criteria(PC) w.r.t. the Scope:	
	Element	Performance Criteria
		To be competent, the user/individual on the job must be able to: PC1. Effective corrective maintenance on all equipment PC2. Login to equipment using Console cable PC3. Escalate faults/issues at site to supervisor PC4. Work closely with ICT Engineer/ NOC and work in tandem for fault rectification PC4. Assist ICT Engineer & NOC in filling the corrective maintenance checklists/reports PC5. Close maximum number of faults reported
Knowledge and Understanding		
A. Organizational Context (Knowledge of the company/ organization & its process relevant to area of responsibilities)		The user/individual on the job needs to know and understand: KA1. corrective maintenance norms as per the company KA2. site up-time targets of the company, to avoid penalties KA3. repair and maintenance guidelines of the company KA4. keep all Fault Rectification Guides handy KA5: alarm Monitoring and clearance process

TEL/N6225

Corrective maintenance at ICT Nodes

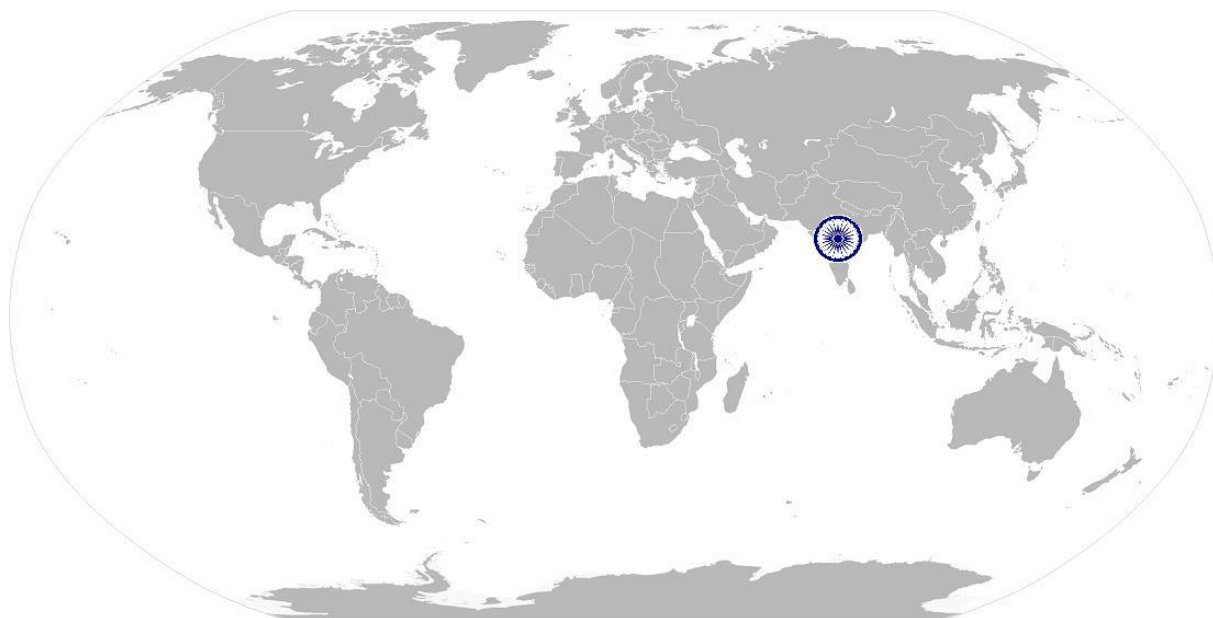
B .Technical Knowledge (To accomplish specific designated responsibilities)	The user/individual on the job needs to know and understand: KB1. functional knowledge of all installed ICT equipment KB2. login process of ICT equipments KB3: basic knowledge of ICT technologies as given below KB4. knowledge of IP standard & protocols like OSI Layer, Number system, Ethernet Standards KB5. knowledge of GSM,3G Technology KB6. knowledge of SDH & DWDM technology KB7: knowledge of Cloud Computing technology, its building blocks KB8. knowledge of Fault Rectification & Alarm handling Process & Manuals and ability to refer them KB9. knowledge of special tools and equipment used for system repairs KB10. use of Laptop and how to connect to equipment
Skills (S)	
A. Domain specific skills	Technical Skills
	The user/ individual on the job to: SA1. diagnose the need for corrective maintenance based on system parameters and performance. SA2. work with console cable, HyperTerminal tools, LCT to login the ICT equipment SA3. undertake rectification tasks for ICT nodes as per guiding document with NOC instruction or ICT Engineer instruction SA4. prioritize to conduct corrective maintenance activities effectively

TEL/N6225

Corrective maintenance at ICT Nodes

NOS Version Control

NOS Code	TEL/N6225		
Credits NSQF	4	Version number	1.0
Industry	Telecom	Drafted on	19-06-2014
Industry Sub-sector	Network Managed Services	Last reviewed on	21-06-2018
Occupation	Network O&M	Next review date	31-03-2019





Qualification Pack for ICT Technician



Criteria for Assessment of Trainees

Job Role : ICT Technician
Qualification Pack TEL/Q6206
Sector Skill Council : Telecom

Guidelines for Assessments

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. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
- 4a. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
- 4b. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
5. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Assessment Outcome

Assessment Criteria

		Total Mark (400)		Out Of	Theory	Skills Practical
TEL/N6222 Site hygiene	PC1. Maintain site hygiene of ICT equipment, as per organization's norms	100		25	10	15
	PC2. Check placement and mechanical stability of equipment racks at the ICT site			20	5	15
	PC3. Check power consumption pattern and report any unusual consumption to supervisor			20	5	15
	PC4. Maintain the escalation matrix in case of emergency			10	5	5
	PC5: Maintain the list of equipment, Rack etc			15	5	10
	PC6: Prioritize and execute tasks in a high-pressure environment			10	5	5
TEL/N6223 Preventive maintenance at ICT nodes	PC1. Obtain the preventive maintenance schedule from the supervisors and adhere to the same	100		15	5	10
	PC2. Keep a check on site up-time and make the logs			25	10	15
	PC3. Notify the network operations center (NOC) or supervisor as per the laid plan prior to undertaking the maintenance work as per the schedule			25	10	15
	PC4. Perform health check on site like checking power etc			20	5	15
	PC5: Document the work done & prepare a report along with ICT Engineer/ NOC			15	5	10
TEL/N6224 Site management	PC1. Receive change requests from the Configuration Management team or the NOC	100		15	5	10
	PC2. Identify criticality, and timelines for carrying out the changes with ICT engineer and NOC			15	5	10
	PC3. Assist to ICT Engineer in developing work plan and identify dependencies			15	5	10
	PC4. Check number of alarms active at the site			30	10	20
	PC5. Attend alarms within the defined SLA(Service level Acknowledgments)			25	10	15
TEL/N6225 Corrective maintenance at ICT nodes	PC1. Effective corrective maintenance on all equipment	100		20	10	10
	PC2. Login to equipment using Console cable			20	5	15
	PC3. Escalate faults/issues at site to supervisor			10	5	5
	PC4. Work closely with ICT Engineer/ NOC and work in tandem for fault rectification			15	5	10
	PC5. Assist ICT Engineer & NOC in filling the corrective maintenance checklists/reports			20	5	15
	PC5. Close maximum number of faults reported			15	5	10