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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Contents

Introduction

Qualifications Pack- Telecom Network Security Technician

SECTOR: TELECOM

SUB-SECTOR: NETWORK MANAGEMENT

OCCUPATION: Technician

REFERENCE ID: TEL/Q6208

ALIGNED TO: NCO-2015/ 3114.1601

Telecom Network Security Technician will deal with implementation, maintenance and security of telecom networks.

Brief Job Description: The Network Security Technician is responsible for the implementation, maintenance, and integration of WAN, LAN and server architecture. This individual is also responsible for implementation and administration of network security hardware and software, enforcing the network security policy and complying with requirements of external security audits and recommendations.

Personal Attributes: This job requires the individual to implement, install and maintain critical network equipment and ensure data security from threats and intrusions.

Job Details

Qualifications Pack Code	**TEL/Q6208**
Job Role	**Telecom Network Security Technician** **This job role is applicable in both national and international scenarios**

Credits (NSQF)	TBD	**Version number**	1.0
Sector	Telecom	**Drafted on**	08/01/2015
Sub-sector	Network Management	**Last reviewed on**	10/06/2015
Occupation	Network O&M	**Next review date**	14/06/2017
NSQC Clearance on	14/03/2016		

| Job Role	Telecom Network Security Technician
Role Description	Network security technicians install, maintain and troubleshoot Local Area Networks, Wide Area Networks and data communications equipment. They also analyze and fix any network security issues.
NSQF level **Minimum Educational Qualifications*** **Maximum Educational Qualifications***	4 ITI (IT related streams) Bachelor in Technology (Electronics, Computer Science & IT)
Training (Suggested but not mandatory)	1.Training on Soft skills 2.Training on Network Hardware(LAN,WAN) & NMT 3.Training on project management
Minimum Job Entry Age	18 Years
Experience	0-2 years of work experience in network management and security
Applicable National Occupational Standards (NOS)	**Compulsory:** 1. TEL/N6229 (Network Administration) 2. TEL/N6230 (Network & Data Security) 3. TEL/N4121(Maintain a healthy, safe and secure working Environment.) **Optional:** N.A.
Performance Criteria	As described in the relevant OS units

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.

The word **Definitions** appears vertically on the left side of the table.

Keywords /Terms	Description
O&M	Operations and Management
LAN	Local Area Network
WAN	Wide Area Network
NMT	Network Management Tools

Acronyms

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National Occupational Standard
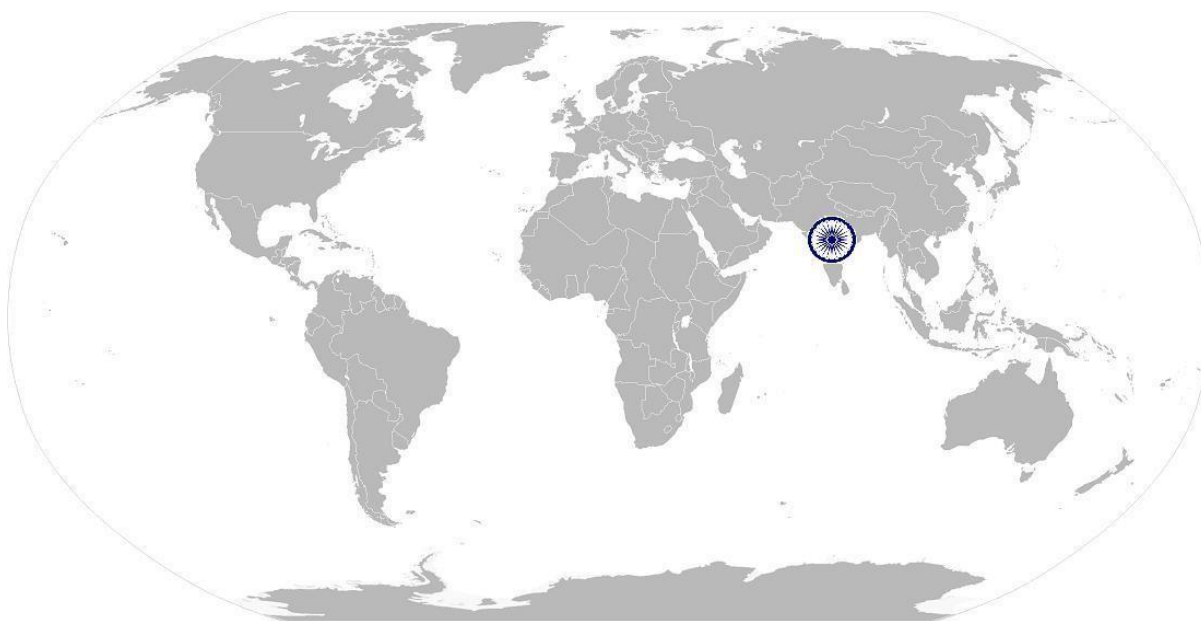
<u>**Overview**</u>

This unit deals with identification, planning, monitoring and maintenance of telecom networks.

Unit Code	TEL/N6229
Unit Title (Task)	Network Administration
Description	Network Administrator is responsible for planning, administration and operation of computer networks. He is also responsible for monitoring network performance and resolving any performance related issues. Other responsibilities include keeping all firmware and software up to date and monitoring network access.
Scope	This unit/task covers the following: - Network Infrastructure requirement definition - Network Planning - Physical Realization of Network - Network Testing & Evaluation - Maintenance and troubleshooting - Report & Record

Performance Criteria(PC) w.r.t. the Scope

Element	Performance Criteria
Network Infrastructure requirement definition	Competent individual on the job must be able to: PC1: identify requirements of nodes, operating systems, internet connectivity pattern and applications in the network PC2: identify protocols used for communications with ISP.
Network Planning	Competent individual on the job must be able to: PC3: define IP addressing schemes for customer PC4: define and create VLAN as per requirement PC5: plan space requirements for network devices PC6: scope out Power and backup requirements
Physical Realization of Network	Competent individual on the job must be able to: PC7: install, configure and test routing plan PC8: install, configure and test LAN and WAN Devices PC9: check connectivity from nodes PC10: grant, control and monitor role based data access to the users PC11: support Disaster Planning Recovery Services
Network Testing & Evaluation	Competent individual on the job must be able to: PC12: test inter department and intra department connectivity PC13: test Load on Network Devices when under full capacity PC14: test all NMS software are working PC15: test all LAN Devices for switching loops and WAN devices for routing loops. PC16: test and resolve congestion issues on the network. PC17: ensure compliance to user and application acceptance criteria

Maintenance and troubleshooting	Competent individual on the job must be able to:
	PC18: monitor network traffic and resolve any congestion or connectivity issues
	PC19: evaluate and implement network management software
	PC20: keep device firmware and other software up to date
Report & Record	Competent individual on the job must be able to:
	PC21: record and maintain network details for future fault localization
	PC22: document , summarize and share results of NMS tests
	PC23: record and maintain data access details
	PC24: record, manage and archive network data

Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand:
	KA1. risk and impact of not following defined procedures/work instructions
	KA2. relevant legislation, standards, policies, and procedures followed in the company
	KA3. how to engage with both internal and external specialists for support in order to resolve incidents and service requests
	KA4. service request procedures, tools, and techniques
	KA5. protection equipment (anti-static wrist bands, shoes, dress, packaging, and other appropriate insulations) that is required to be used.
	KA6. first aid requirements in case of electrical shocks, cuts and other common injuries.
B. Technical Knowledge	The user/individual on the job should have knowledge of:
	KB1. IP Addressing format for IPv4 and IPv6
	KB2. VLAN and their limitations.
	KB3. different Network Management Systems and routing protocols.
	KB4. different ways of configuring access-list.
	KB5. troubleshooting common LAN issues.
	KB6. understanding analytic data

| **Skills (S) [Optional]**	
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to:
	SA1. Fill up appropriate technical forms, activity logs in required format of the company
	SA2. Maintain proper records as per given format
	Reading Skills
	The user/individual on the job needs to know and understand how to:
	SA3. Read and understand manuals, work orders, health and safety instructions, memos, reports etc.

|	
	Oral Communication (Listening and Speaking skills)
	SA4. Liaise and coordinate with third party vendors
	SA5. Communicate with supervisor and peers
	SA6. Communicate in the local language
A. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to:
	SB1. make decisions pertaining to the concerned area of work
	Plan and Organize
	The user/individual on the job needs to know and understand:
	SB2. plan and organize service feedback files/documents
	Customer Centricity
	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
	Problem Solving
	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
	Analytical Thinking
	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
	Critical Thinking
	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

NOS Version Control

NOS Code	TEL/ N6229		
Credits (NSQF)	TBD	Version number	1.0
Industry	Telecom	Drafted on	08/01/2015
Industry Sub-sector	Network Management	Last reviewed on	10/06/2015
Occupation	Telecom Network Security Technician	Next review date	14/06/2017
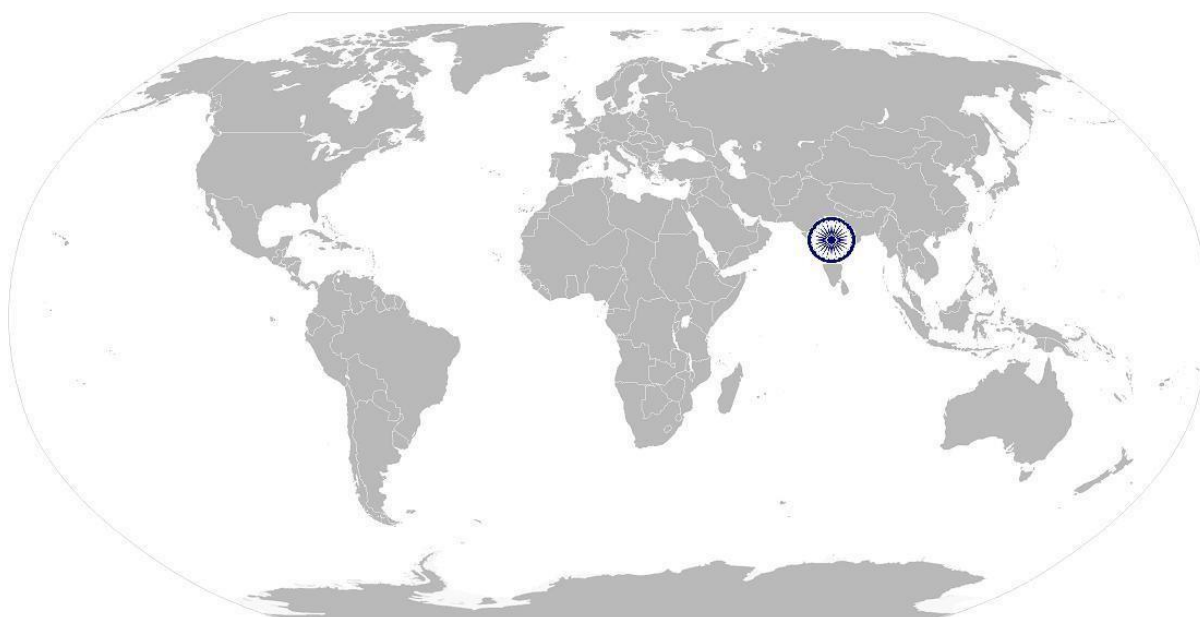
National Occupational Standard
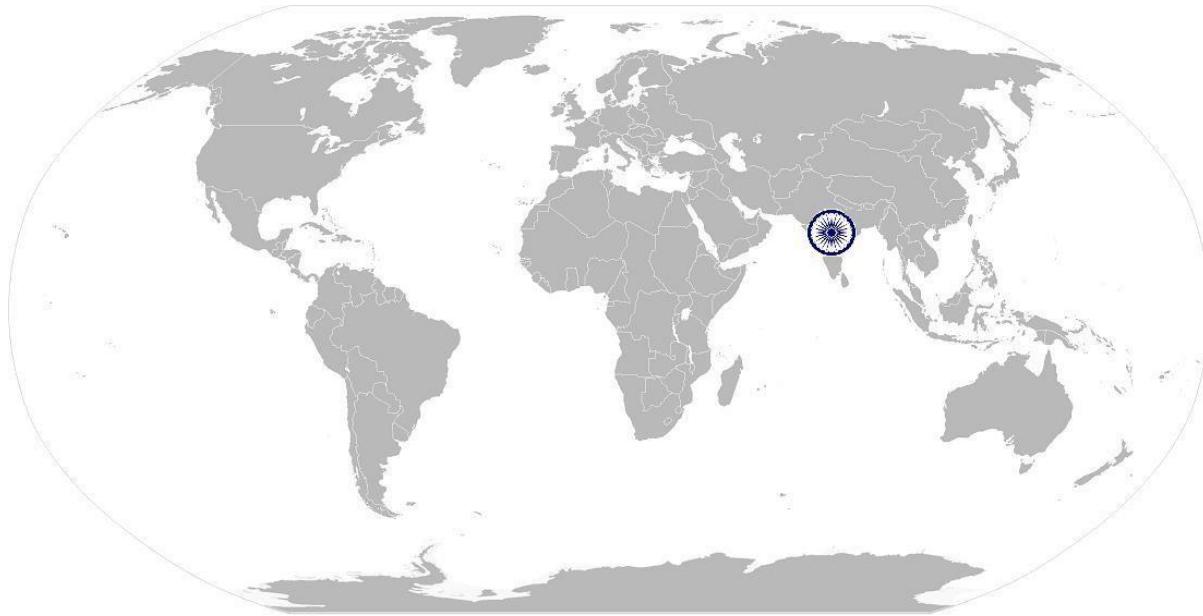
Overview

This unit deals with knowledge of networks, their vulnerabilities and respective remedies to keep the network safe and secure.

National Occupational Standard

Unit Title (Task)	Network & Data Security
Description	Network & Data Security Technician is responsible for defining and enforcing security policies to ensure data security on the network. They are also responsible for testing networks for vulnerabilities and developing mitigation strategies in case of intrusions.
Scope	This unit/task covers the following: **Network Security Infrastructure Definition** • nodes • OS • connectivity **Network Vulnerability Assessment** • network intrusion • host intrusion • file integrity • software **Network Security** • firewall • access control • network scan **Report & Record** • incidents • vulnerabilities

Performance Criteria(PC) w.r.t. the Scope

Element	Performance Criteria
Network Security Infrastructure Definition	Competent individual on the job must be able to: PC1: identify requirements of nodes, operating systems, internet connectivity pattern and applications in the network from security perspective
Network Vulnerability Assessment	Competent individual on the job must be able to perform: PC2: network-based Intrusion Detection and risk assessment PC3: host-based Intrusion Detection PC4: file integrity verification and monitoring software components
Network Security	Competent individual on the job must be able to: PC5: define and enforce security policies and procedures PC6: define, manage and monitor access control PC7: setup and administrate firewall PC8: evaluate system using vulnerability scanners to verify system security PC9: monitor the network, identify anomalies from security perspective, investigate & identify security incidents and perform remediation. PC10: evaluate and recommend new security policies and products

Report & Record	Competent individual on the job must be able to:
	PC11: record and document any security incidents
	PC12: document , summarize and share results of vulnerability and penetration tests
	PC13: periodically report identified risks and available counter measures.

Knowledge and Understanding (K)

B. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. risk and impact of not following defined procedures/work instructions KA2. relevant legislation, standards, policies, and procedures followed in the company KA3. how to engage with both internal and external specialists for support in order to resolve incidents and service requests KA4. service request procedures, tools, and techniques KA5. protection equipment (anti-static wrist bands, shoes, dress, packaging, and other appropriate insulations) that is required to be used. KA6. first aid requirements in case of electrical shocks, cuts.
B. Technical Knowledge	The user/individual on the job should have knowledge of KB1. IP Addressing format for IPv4 and IPv6. KB2. VLAN and their limitations. KB3. overall network & interconnection of systems KB4. different Network Management Systems and routing protocols. KB5. security vulnerabilities and remediation techniques KB6. authentication and security protocols and cryptography

Skills (S) [Optional]

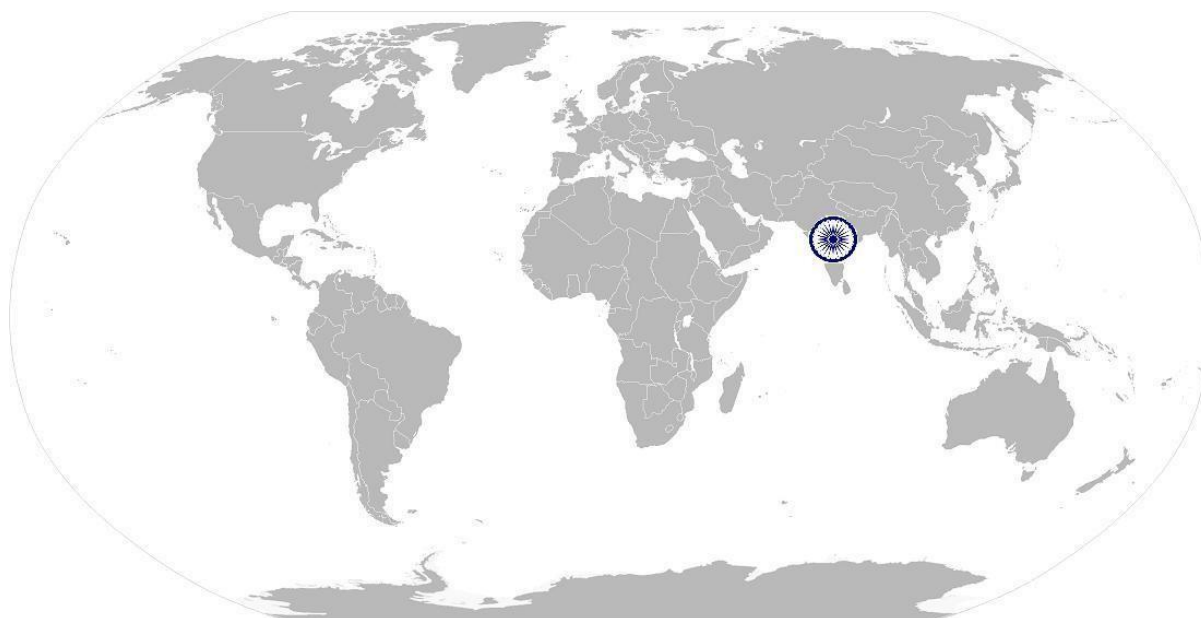| **B. Core Skills/ Generic Skills**	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1: fill up appropriate technical forms, activity logs in required format of the company SA2: maintain proper records as per given format
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA3: read and understand manuals, work orders, health and safety instructions, memos, reports etc.
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA4. liaise and coordinate with third party vendors SA5. communicate with supervisor and peers SA6. communicate in the local language

TEL/N6230   **Network & Data Security**

C. Professional Skills	Decision Making
	The user/individual on the job needs to know and understand how to: SB1. make decisions pertaining to the concerned area of work
	Plan and Organize
	The user/individual on the job needs to know and understand: SB2. Plan and organize service feedback files/documents
	Customer Centricity

	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

	Problem Solving

	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

	Analytical Thinking

	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

	Critical Thinking
	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

NOS Version Control

NOS Code	TEL/N6230		
Credits (NSQF)	TBD	Version number	1.0
Industry	Telecom	Drafted on	08/01/2015
Industry Sub-sector	Network Management	Last reviewed on	10/06/2015
Occupation	Telecom Network Security Technician	Next review date	14/06/2017

National Occupational Standard

<u>**Overview**</u>

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

TEL/N6231   **Maintain a healthy, safe and secure working environment**

National Occupational Standard

Unit Code	TEL/N6231
Unit Title (Task)	**Maintain a healthy, safe and secure working environment**
Description	This unit is about monitoring your working environment and making sure it meets requirements for health, safety and security.
Scope	This unit/task covers the following: Emergency procedures: • illness • accidents • fires • other reasons to evacuate the premises • breaches of security

Performance Criteria(PC) w.r.t. the Scope

Element	Performance Criteria
Emergency procedures	To be competent, the user/individual on the job must be able to: PC1. ensure that work is carried out in accordance to the level of competence and legal requirements PC2. ensure that sites are assessed for health and safety risk as per company's guidelines prior to commencement of work PC3. ensure environmental conditions and hazards like Earth Potential Rise (EPR) are considered while carrying out the work PC4. identify and correct any hazards that you can deal with safely, competently and within the limits of your authority 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 PC6. follow your organization's emergency procedures promptly, calmly, and efficiently PC7. identify and recommend opportunities for improving health, safety, and security to the designated person PC8. complete any health and safety records legibly and accurately

Knowledge and Understanding (K)

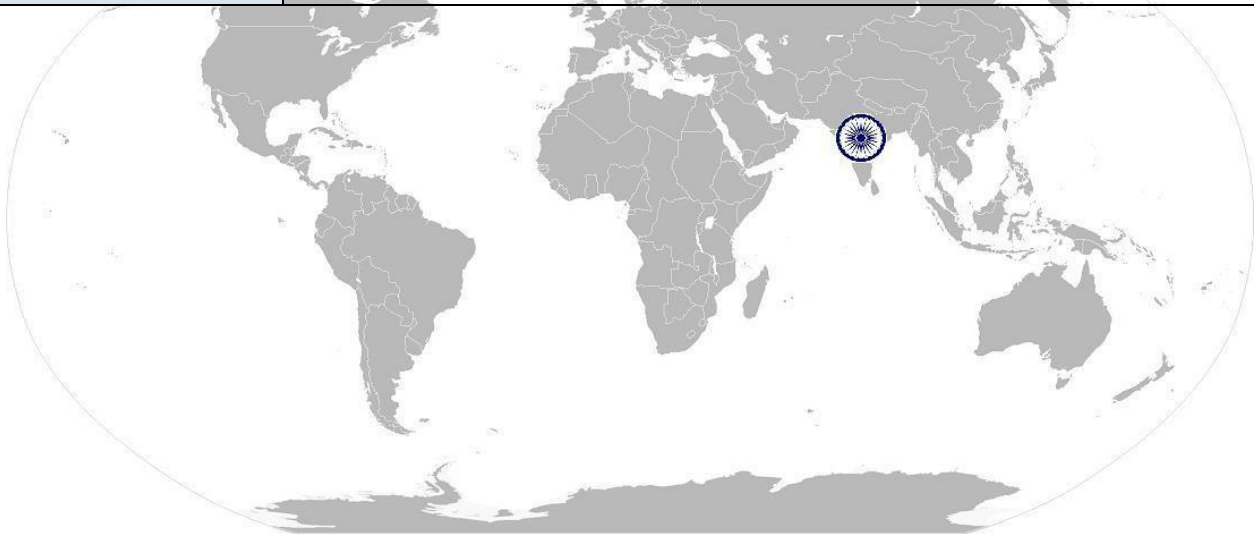| C. **Organizational Context** (Knowledge of the company / organization and its processes) | The user/individual on the job needs to know and understand:
 KA1. legislative requirements and organization's procedures for health, safety and security and your role and responsibilities in relation to this
 KA2. what is meant by a hazard, including the different types of health and safety hazards that can be found in the workplace
 KA3. how and when to report hazards
 KA4. limits of your responsibility for dealing with hazards
 KA5. your organization's emergency procedures for different emergency situations and the importance of following these
 KA6. the importance of maintaining high standards of health, safety and security
 KA7. implications that any non-compliance with health, safety and security may have on individuals and the organization |

B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. different types of breaches in health, safety and security and how and when to report these KB2. evacuation procedures for workers and visitors KB3. how to summon medical assistance and the emergency services, where necessary KB4. how to use the health, safety and accident reporting procedures and the importance of these KB5. government agencies in the areas of safety, health and security and their norms and services

Skills (S) [Optional]

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D. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. Complete accurate, well written work with attention to detail
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA2. Read instructions, guidelines, procedures, rules and service level agreements
	Oral Communication (Listening and Speaking skills)
	You need to know and understand how to: SA3. Listen effectively and orally communicate information accurately
E. Professional Skills	**Decision Making**
	The user/individual on the job needs to know and understand how to: SB1. Make decisions on suitable course of action
	Plan and Organize
	The user/individual on the job needs to know and understand: SB2. Plan and organize your work to meet health, safety and security requirements
	Customer Centricity
	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/N6231   **Maintain a healthy, safe and secure working environment**

	Problem Solving
	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
	Analytical Thinking
	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
	Critical Thinking
	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

NOS Version Control

NOS Code		TEL/N6231	
Credits (NSQF)	TBD	Version number	1.0
Industry	Telecom	Drafted on	08/01/2015
Industry Sub-sector	Network Management	Last reviewed on	10/06/2015
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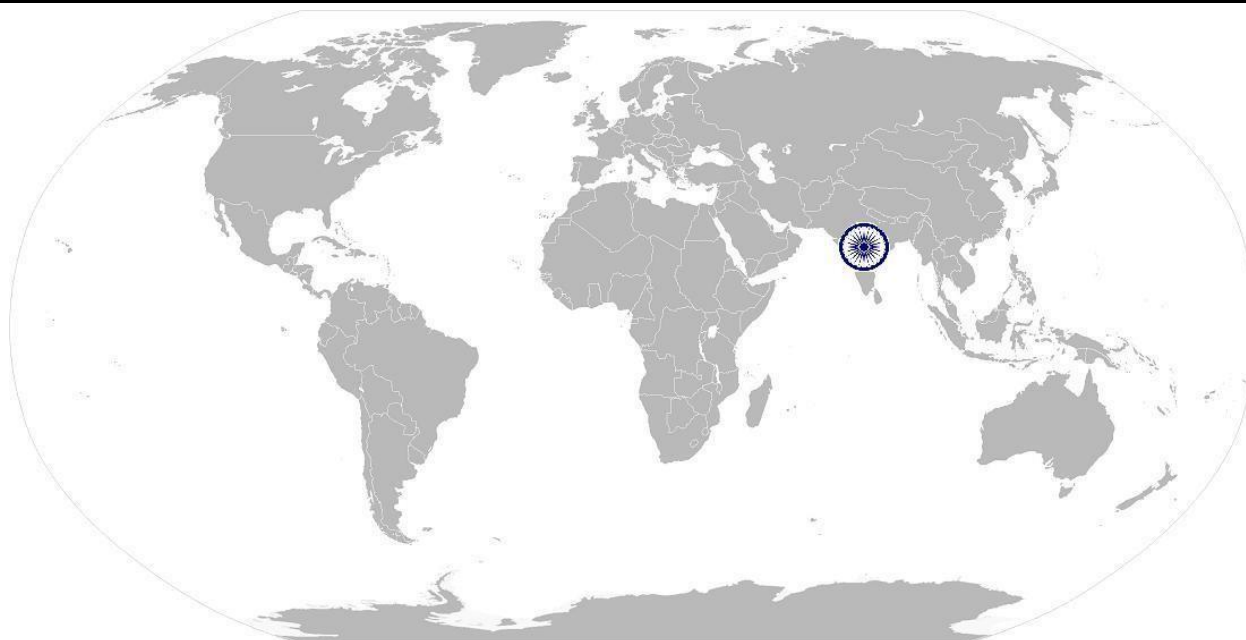
CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Telecom Network Security Technician

Qualification Pack TEL/ Q6208

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

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		Total Mark (400 + 100)	Out Of	Marks Allocation	
				Theory	Skills Practical
1. TEL/N6229 (Network Administration)	PC1: Identify requirements of nodes, operating systems, internet connectivity pattern and applications in the network		15	10	5
	PC2: Identify protocols used for communications with ISP	**200**	10	5	5
	PC3: Define IP addressing schemes for customer		15	10	5
	PC4: Define and create VLAN as per requirement		20	10	10

	PC5: Plan space requirements for network devices		10	5	5
	PC6: Scope out Power and backup requirements		10	5	5
	PC7: Install, configure and test routing plan		15	7	8
	PC8: Install, configure and test LAN and WAN Devices		15	7	8
	PC9: Check connectivity from nodes		10	5	5
	PC10: Granting, controlling and monitoring network access of all users		10	5	5
	PC11: Support Disaster Planning Recovery Services		10	5	5
	PC12: Testing inter department and intra department connectivity		10	5	5
	PC13: Testing Load on Network Devices when under full capacity		10	5	5
	PC14: Testing all NMS software are working		10	5	5
	PC15: Testing all LAN Devices for switching loops and WAN devices for routing loops.		10	5	5
	PC16: Testing and resolving congestion issues on the network.		10	5	5
	PC17: Ensure compliance to user and application acceptance criteria		10	5	5
	PC18: Monitoring network traffic and		10	5	5
	PC19: Evaluating and implementing network management Software		20	5	15
	PC20: Keeping device firmware and other software up to date		10	5	5

	PC21: Record and maintain network details for future fault localization		5	2	3
	PC22: Document , summarize and share results of NMS tests		5	2	3
	PC23: Record and maintain network access details		5	2	3
	PC24: Record, manage and archive network data		5	2	3
		Total	200	92	108

2.TEL/N6230(Network and data security)	PC1. Identify requirements of nodes, operating systems, internet connectivity pattern and applications in the network from security perspective		20	10	10
	PC2. Network-based Intrusion Detection		20	5	15
	PC3. Host-based Intrusion Detection	**200**	20	5	15
	PC4. File integrity verification and monitoring software		20	10	10
	PC5. Define and enforce security policies and procedures		15	10	5
	PC6. Define and monitor access control		15	10	5
	PC7. Setup and administrate firewall		20	10	10

	PC8. Evaluate system using vulnerability scanners to verify system security		20	10	10
	PC9. Develop mitigations strategies in case of intrusions		20	10	10
	PC10. Evaluate and recommend new security policies and products		20	10	10
	PC11. Record and document any security incidents		3	2	1
	PC12. Document , summarize and share results of vulnerability and penetration tests		4	2	2
	PC13. Periodically report identified risks and available counter measures.		3	2	1
		Total	200	96	104

TEL/N6231(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		10	6	4
	PC2. Ensure that sites are assessed for health and safety risk as per company's guidelines prior to commencement of work	**100**	12	6	6
	PC3.Ensure environmental conditions and hazards like Earth Potential Rise (EPR) are considered while carrying out 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
	C8.Complete any health and safety records legibly and accurately		10	5	5
		Total	100	57	43