

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, C-DOT
Campus, Mandi
Road, Mehrauli
New Delhi - 110030
T: +91 11 26598711
F: +91 11 26805318

E-mail:
tssc@tsscindia.com



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Introduction

Qualifications Pack- Optical Fiber Technician

SECTOR: TELECOM

SUB-SECTOR: Network Managed Services

OCCUPATION: Network Operations & Maintenance – Optical

REFERENCE ID: TEL/Q6401

Brief Job Description: Optical fiber technician is responsible for maintaining uptime and quality of the network segment (both optical media & equipment) assigned to him by undertaking periodic preventive maintenance activities and ensuring effective fault management in case of fault occurrence. He is also required to coordinate activities for installation and commissioning of Optical Fibre Cable (OFC) as per the route plan.

Personal Attributes: This job requires the individual to work closely with multiple teams and operate in field which may consist of difficult terrain. The individual should be able to handle high pressure situations and be analytical to successfully perform the assigned responsibilities. It is preferred that individual is well versed with local language to coordinate with local labors.

Qualifications Pack For Optical Fiber Technician

Job Details	Qualifications Pack Code	TEL/Q6401		
	Job Role	Optical Fiber Technician		
	Credits(NVEQF/NVQF/NSQF) [OPTIONAL]	TBD	Version number	1.0
	Sector	Telecom	Drafted on	17/06/13
	Sub-sector	Network Managed Services	Last reviewed on	21/06/13
	Occupation	Network Operations & Maintenance - Optical	Next review date	31/05/15

Job Role	Optical Fiber Technician
Role Description	Optical fiber technician is responsible for maintaining uptime and quality of the network segment (both optical media & equipment) assigned to him by undertaking periodic preventive maintenance activities and ensuring effective fault management in case of fault occurrence. He is also required to coordinate activities for installation and commissioning of Optical Fibre Cable (OFC) as per the route plan
NVEQF/NVQF level	4
Minimum Educational Qualifications*	Class VIII
Maximum Educational Qualifications*	ITI/ Diploma/ Bachelor in Technology (Any field)
Training	<ol style="list-style-type: none"> 1. Training on Soft Skills (mandatory for Class VIII to XII) 2. Technical trainings on interpreting OTDR, power and light meter test results; Project management trainings(mandatory for all)
Experience	<ol style="list-style-type: none"> 1. In case educational qualification Class VIII to XII- Worked as optical fiber splicer for minimum 4-5 years 2. In case educational qualification ITI/ Diploma/ Bachelor in Technology- Worked as optical fiber splicer for 1-2 years
Applicable National Occupational Standards (NOS)	(Click to open the below hyperlinks) Compulsory: <ol style="list-style-type: none"> 1. TEL/N6402 (Co-ordinate Installation & Commissioning of Optical fiber cables (OFC)) 2. TEL/N6403 (Undertake Condition based Maintenance & Planned repair activities) 3. TEL/N6404 (Perform corrective maintenance/ restoration of optical fault) Optional: <ol style="list-style-type: none"> 4. NA
Performance Criteria	As described in the relevant OS units

Qualifications Pack For Optical Fiber Technician

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.

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Acronyms

Keywords /Terms	Description
DG	Diesel Generator
EB Connection	Electricity Board
IP	Internet Protocol
MUX	Multiplexer
OHS	Organizational Health & Safety
OTDR	Optical Time Domain Reflectometer
RCC Pipes	Reinforced Cement Concrete
SHE	Safety, Health & Environment
STM	Synchronous Transport Module
TDM	Time Division Multiplexing



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National Occupational Standard



Overview

This unit is about coordinating installation and commissioning of optical fiber cables as per route plan and testing the effectiveness of joints

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Co-ordinate Installation & Commissioning of Optical Fiber Cables (OFC)

National Occupational Standard	Unit Code	TEL/N6402
	Unit Title (Task)	Co-ordinate Installation & Commissioning of Optical fiber cables (OFC)
	Description	This unit is about coordinating activities like trenching and laying of cables for installation and commissioning of Optical Fibre Cables and testing the joints for effective transmission.
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Carrying out inspection of route plan • Co-ordinating trenching, laying, jointing and blowing of cables • Testing effectiveness of jointing • Closing the activity and documenting the test results
Performance Criteria (PC) w.r.t. the Scope		
	Element	Performance Criteria
	Carry out Inspection of route plan and obtain necessary clearances	<p>To be competent, the user/individual on the job must be able to</p> <p>PC1. obtain OFC route plan from the planning team or the supervisors as per which OFC has to be laid</p> <p>PC2. verify the proposed route to ensure that bend ratios meet manufacturer's specifications and industry standards</p> <p>PC3. ensure that site is made safe and secure for cable installation in coordination with labour workers</p> <p>PC4. develop installation work plan and identify dependencies if any</p> <p>PC5. determine the statutory permissions required and the relevant authorities involved</p> <p>PC6. liaise with authorities and obtain relevant clearances</p>
	Arrange for tools and spares	<p>PC1. ensure availability of test equipments like OTDR and Power meter for carrying out optical tests</p> <p>PC2. ensure availability of all required trenching, cable laying, pipe laying, OFC laying and splicing equipments and spares for timely completion of installation activity</p> <p>PC3. ensure that faulty equipments are sent to logistics team for repair and replacement</p> <p>PC4. ensure calibration status of equipments to be used (eg.splicing machine, OTDR, power meter, cleaver)</p>
	Coordinate trenching, cable laying, jointing and cable blowing activities	<p>PC1. ensure cable drum is placed near site location and test cable on drum for optical continuity</p> <p>PC2. ensure trenching is carried out by labour workers as per the route plan requirements and site terrain</p> <p>PC3. ensure minimum radius is maintained, where bends are necessary</p> <p>PC4. ensure use of specially designed dispensers to place the ducts in the trench as</p>

Co-ordinate Installation & Commissioning of Optical Fiber Cables (OFC)

	<p>straight as possible</p> <p>PC5. ensure pipe/ ducts are placed at lower appropriate depths as per the laying standards after approval from competent personnel</p> <p>PC6. ensure that ducts are free from twists, collapsed portions and that all such portions are rectified by using appropriate couplers</p> <p>PC7. ensure proper uncoiling of PLB ducts</p> <p>PC8. ensure duct joints are airtight to ensure smooth cable blowing using cable blowing machines</p> <p>PC9. ensure cable blowing/ jetting is carried out using rodder as per standard process</p> <p>PC10. ensure availability of additional cable length (loop) at jointing locations, for future use in case of failures</p> <p>PC11. ensure that ends of ducts are closed with End Plugs to avoid ingress of mud, water or dust</p> <p>PC12. ensure that entire length of the duct is cleaned to remove sand, dust that may damage the optical fiber cable</p> <p>PC13. ensure that cables are appropriately prepared for Jointing based on colour and/ or sequence matching</p> <p>PC14. ensure the cables are joined/ spliced by Optical fibre splicer as per the standard fusion/ mechanical splicing mechanisms</p> <p>PC15. ensure use of proper protection material such as GI pipes, RCC pipes, RCC half-cut pipes etc.</p> <p>PC16. ensure use of Pushfit couplers as duct joints</p> <p>PC17. identify instances of cross fibre using power source and power meter tests and ensure their elimination</p> <p>PC18. ensure appropriate optical connectors are used as per the terminating equipment requirements</p> <p>PC19. verify if ducts require additional protection like cover of RCC pipes, chambering and concreting based on site location and terrain</p> <p>PC20. ensure installation activity is completed within the defined SLAs</p> <p>PC21. ensure timely completion of work by monitoring activities performed by the labour workers and optical splicers</p> <p>PC22. ensure compliance to enterprise policy while escalating instances of delays</p>
<p>Test effectiveness & close activity</p>	<p>PC1. ensure use of appropriate color for the route indicators and joint indicators as per standards</p> <p>PC2. ensure splices are within the quality assurance/ AT standards</p> <p>PC3. test the joint for transmission loss and strength and re-terminate the joint if the transmission loss exceeds the manufacturer's specifications</p> <p>PC4. ensure backfilling and crowning in coordination with the labour workers as per standard requirements</p> <p>PC5. ensure stone marker at the jointing pit has to be provided for identification of route as well as jointing pit</p>

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Co-ordinate Installation & Commissioning of Optical Fiber Cables (OFC)

	<p>PC6. ensure appropriate cable markings as per guidelines</p> <p>PC7. ensure updation of As-build documents based on joint location and installed fibre route</p> <p>PC8. clear sites from debris and other items</p>
<p>Health and Safety</p>	<p>PC1. ensure appropriate disposal of the cut fibers, sleeves and cable pieces</p> <p>PC2. ensure compliance with site risk control, OHS, environmental and quality requirements as per company's norms</p> <p>PC3. ensure that work is carried out in accordance to the level of competence and legal requirements</p> <p>PC4. ensure that sites are assessed for health and safety risk as per company's guidelines prior to commencement of work</p> <p>PC5. ensure compliance to health and safety guidelines by optical splicer and installation labour workers</p> <p>PC6. ensure that Personal protection equipments like helmets, knee pads, safety boots, safety glasses and trench guards are appropriately used as required</p> <p>PC7. ensure environmental conditions and hazards like Earth Potential Rise (EPR) are considered while carrying out the work</p> <p>PC8. ensure adherence to emergency plans in case of safety incidents</p> <p>PC9. ensure escalation of safety incidents to relevant authorities as per guidelines legal requirements</p>
<p>Report & Record</p>	<p>PC1. ensure cable id/ make and drum numbers are recorded for future fault localization</p> <p>PC2. ensure OTDR finding are documented & summary of tests are shared with appropriate teams</p> <p>PC3. obtain sign-off from the projects team and communicate status to NOC for cable integration</p> <p>PC4. ensure that documents are available to all appropriate authorities to inspect</p>
<p>Knowledge and Understanding (K)</p>	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. risk and impact of not following defined procedures/work instructions</p> <p>KA2. escalation matrix for reporting identified incidents, troubles and/ or emergencies e.g. system failures ,fire and power failures</p> <p>KA3. clearances/ municipal approvals that are required prior to carrying out the installation work</p> <p>KA4. types of documentation in organization and importance of the same</p> <p>KA5. records to be maintained and implications of non-maintenance of the same</p> <p>KA6. knowledge of spare management and repair & return process for faulty equipments</p> <p>KA7. SHE and OHS guidelines and regulations as per company's norms</p> <p>KA8. personal protection equipments like helmets, knee pads, safety boots, safety glasses and trench guards that are required to be used</p>

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Co-ordinate Installation & Commissioning of Optical Fiber Cables (OFC)

	<p>KA9. first aid requirements in case of electrical shocks, cuts, fall and other common injuries</p> <p>KA10. electrical and chemical, environmental related hazards and precautionary measures</p> <p>KA11. usage of fire safety equipments</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. principles of optical transport media and OFC communication</p> <p>KB2. knowledge of Optical fiber characteristics like refraction, polarization, attenuation, dispersion</p> <p>KB3. bands in optical fibre and their usability, loss characteristics</p> <p>KB4. signal strength and quality KPIs – design values and margins</p> <p>KB5. functionality of optical equipments like cleaver, mechanical and fusion splicing kit, protection sleeves, fiber stripper, fiber reinforced plaster during splicing and jointing</p> <p>KB6. functionality of optical test equipments like OTDR and power meter</p> <p>KB7. optimal values of OTDR, Power meter and light meter test results</p> <p>KB8. utility of As-build route diagrams</p> <p>KB9. standard trenching, cable laying, pit preparation, splicing, jointing, blowing and back-filling process for installation of OFC cables</p> <p>KB10. different types of OFC connectors based on the type of equipments</p>
<p>Skills (S)</p>	
<p>A. Core Skills/ Generic Skills</p>	<p>Basic Reading & Writing Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. fill up appropriate technical forms, activity logs in required format of the company</p> <p>SA2. maintain proper records as per given format</p> <p>SA3. read and understand manuals, work orders, health and safety instructions, memos, reports etc.</p> <p>Communication Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA4. liaise and coordinate with third party vendors</p> <p>SA5. communicate with supervisor and peers</p> <p>SA6. communicate in the local language</p> <p>Project Management Skills</p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. prioritize and execute tasks in a high-pressure environment and handle high pressure situations</p> <p>SA8. handle multiple tasks and completing them successfully within due timelines</p> <p>SA9. use and maintain resources efficiently and effectively</p> <p>SA10. be flexible and accept changes in job requirements, schedules, or work environments</p>

	Other Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA11. interpret test reports, as made route diagrams and other numerical data</p> <p>SA12. create and maintain effective working relationships and team environment</p> <p>SA13. take initiatives and progressively assume increased responsibilities</p> <p>SA14. share knowledge with other team members and colleagues</p>
B. Professional Skills	Equipment operating Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. utilize appropriate optical equipments like cleaver, mechanical and fusion splicing kit, protection sleeves, fiber stripper, fiber reinforced plaster during splicing and jointing</p> <p>SB2. operate optical test equipments like OTDR and power meter</p>
	OFC splicing and splice testing skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. undertake GPS based route survey to capture appropriate site details</p> <p>SB4. utilize appropriate fiber like single mode and multi mode optical fibre based on specific requirements</p> <p>SB5. lay duct using specially designed dispensers</p> <p>SB6. carry out splicing in a manner ensuring minimum reflectance loss, optical return loss, insertion loss</p> <p>SB7. perform optical link testing as per standard process</p> <p>SB8. utilize appropriate optical test equipments like OTDR, power meter based on test requirements</p> <p>SB9. perform OFC tests for quality check or Acceptance testing</p> <p>SB10. prepare test reports in the specified formats</p> <p>SB11. rectify deviations in the test reports by reperforming the splicing/ testing operations</p> <p>SB12. perform OTDR test as per standard process and summarize OTDR reports for records and review</p> <p>SB13. perform Power meter tests as per standard process and identify instances of cross-fibres</p> <p>SB14. appropriately mark/ tag cables to identify direction and route</p> <p>SB15. utilize suitable OFC connectors are used based on the termination equipment</p>
	Technical interpretation Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. identify appropriate cables for splicing based on sequence or color coding to avoid occurrence of instances of cross fibers</p> <p>SB16. interpret As made documents and perform update based on actual cable routes, joints</p> <p>SB17. interpret OTDR and power meter test results to identify and localize faults and/ or measure optical losses</p> <p>SB18. interpret optical link testing results to ensure link margins</p>

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Co-ordinate Installation & Commissioning of Optical Fiber Cables (OFC)

	Problem solving Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none">SB19. utilize appropriate tools to rectify faultsSB20. utilize appropriate communication channels to escalate unresolved problems to relevant personnel



NOS Version Control

NOS Code	TEL /N6402		
Credits(NVEQF/NVQF/NSQF) [OPTIONAL]	TBD	Version number	1.0
Industry	Telecom	Drafted on	17/06/13
Industry Sub-sector	Network Managed Services	Last reviewed on	21/06/13
		Next review date	31/05/15



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National Occupational Standard



Overview

This unit is about carrying out condition based maintenance and planned repair activities of OFC cables to ensure network availability and high quality network transmission

National Occupational Standard	Unit Code	TEL/N6403
	Unit Title (Task)	Undertake Condition based Maintenance & Planned repair activities
	Description	It involves Carrying out planned maintenance testing and repairs and carrying out condition based maintenance of equipments deployed at POPs
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Patrolling assigned cable routes • Carrying out planned maintenance testing and repairs • Carrying out condition based maintenance of equipments deployed at POPs • Closing the activity and documenting the test results
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Obtain maintenance schedule and patrol assigned route section	<p>To be competent, the user/individual on the job must be able to</p> <p>PC1. ensure As-build drawing is obtained from the NOC/ supervisors and identify the OFC route assigned for maintenance</p> <p>PC2. ensure availability of optical test tools like OTDR, Power meter, Light meter</p> <p>PC3. ensure patrolling and surveillance of OFC route as per the maintenance plan</p> <p>PC4. ensure monitoring of jobs undertaken by other agencies in the vicinity of OFC network to ensure the safety of OFC cable</p> <p>PC5. coordinate and liaise with authorities for checking for any planned construction/ activity in the vicinity of the OFC</p> <p>PC6. ensure sample check of as-built drawings</p> <p>PC7. ensure changes to as-build drawings are communicated to the NOC/ supervisors for updating the document</p>
	Arrange for tools and spares	<p>PC8. ensure availability of test equipments like OTDR and Power meter for carrying out optical tests</p> <p>PC9. ensure availability of optical equipments like spool, joint closure, connectors, splicers and cleaver</p> <p>PC10. ensure inputs based on test results are provided to planning team for developing route strengthening workplans</p> <p>PC11. ensure calibration status of equipments to be used (eg.splicing machine, OTDR, power meter, cleaver)</p>
	Carry out maintenance testing of dark/ spare OFC	<p>PC12. ensure performance of OTDR, Power Meter tests for all the dark/ spare fibers as per required periodicity</p> <p>PC13. ensure testing of end-to-end link for adherence to link budget and identify loss and reflection points</p> <p>PC14. ensure inputs based on test results are provided to planning team for</p>

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Undertake Condition based Maintenance & Planned repair activities

	<p>developing route strengthening workplans</p>
<p>Carry out planned repairs to the OFC</p>	<p>PC15. coordinate with Network Operating Centre (NOC) prior to undertaking the planned repair activities and obtain time block for carrying out the activity</p> <p>PC16. ensure that the planned repair activities are completed within the defined timelines</p> <p>PC17. confirm effectiveness of the planned repair process by carrying out optical tests on spare fibers</p> <p>PC18. in case, active fibers are to be used for testing, fibres are to be used, ensure precautions are taken with regard to the power launched on to the fibre</p> <p>PC19. ensure installation activity is completed within the defined SLAs</p> <p>PC20. ensure compliance to enterprise policy while escalating instances of delays</p> <p>PC21. ensure timely escalation of emergency/ unresolved issues according to established Company's procedure</p>
<p>Carry out maintenance of equipments at Points of Presence (POPs)</p>	<p>PC22. conduct periodic (monthly, quarterly, half yearly) maintenance activities</p> <p>PC23. ensure completion of physical maintenance tasks like checking battery voltage levels, electrolyte levels; DG set auto-start, oil levels; Air conditioner gas level, filter condition; Earthing, Fire alarm system and other power equipments (including MCBs)</p> <p>PC24. ensure general upkeep of co-located electronic equipments and ensure testing of alarms in coordination of NOC</p> <p>PC25. ensure that live/ working fibres are not disturbed while testing</p> <p>PC26. carry out planned repairs to existing joints and terminations in co-ordination with NCC for improvement of link margin</p> <p>PC27. ensure that for 3rd party elements that require maintenance, tickets are raised to the respective vendors by the NOC team</p>
<p>Health and Safety</p>	<p>PC28. ensure appropriate disposal of the cut fibers, sleeves and cable pieces</p> <p>PC29. ensure compliance with site risk control, OHS, environmental and quality requirements as per company's norms</p> <p>PC30. ensure that work is carried out in accordance to the level of competence and legal requirements</p> <p>PC31. ensure that sites are assessed for health and safety risk as per company's guidelines prior to commencement of work</p> <p>PC32. ensure compliance to health and safety guidelines by optical splicer and installation labour workers</p> <p>PC33. ensure that Personal protection equipments like helmets, knee pads, safety boots, safety glasses and trench guards are appropriately used as required</p> <p>PC34. ensure environmental conditions and hazards like Earth Potential Rise (EPR) are considered while carrying out the work</p> <p>PC35. ensure escalation of safety incidents to relevant authorities as per guidelines</p>

Undertake Condition based Maintenance & Planned repair activities

	<p>legal requirements</p>
<p>Report & Record</p>	<p>PC36. ensure completion of Patrolling register showing complete log in chronological order Kilometer wise of the patrolling in the section</p> <p>PC37. ensure completion of OFC/OTDR register showing complete record of all fibers tests</p> <p>PC38. keep account of diesel oil at respective stations and ensure maintenance of assets register for sites under supervision</p> <p>PC39. ensure summary of OTDR finding is to be made & sent to the respective territory manager for planning and monitoring cable improvement works</p> <p>PC40. ensure that documents are available to all appropriate authorities to inspect</p>
<p>Knowledge and Understanding (K)</p>	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. risk and impact of not following defined procedures/work instructions</p> <p>KA2. escalation matrix for reporting identified incidents, troubles and/ or emergencies e.g. system failures ,fire and power failures</p> <p>KA3. types of documentation in organization and importance of the same</p> <p>KA4. records to be maintained and implications of non-maintenance of the same</p> <p>KA5. knowledge of spare management and repair & return process for faulty equipments</p> <p>KA6. SHE and OHS guidelines and regulations as per company’s norms</p> <p>KA7. personal protection equipments like helmets, knee pads, safety boots, safety glasses and trench guards that are required to be used</p> <p>KA8. first aid requirements in case of electrical shocks, cuts, fall and other common injuries</p> <p>KA9. electrical and chemical, environmental related hazards and precautionary measures</p> <p>KA10. usage of fire safety equipments</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. principles of optical transport media and OFC communication</p> <p>KB2. knowledge of Optical fiber characteristics like refraction, polarization, attenuation, dispersion</p> <p>KB3. bands in optical fibre and their usability, loss characteristics</p> <p>KB4. signal strength and quality KPIs – design values and margins</p> <p>KB5. functionality of optical equipments like cleaver, mechanical and fusion splicing kit, protection sleeves, fiber stripper, fiber reinforced plaster during splicing and jointing</p> <p>KB6. functionality of optical test equipments like OTDR and power meter</p> <p>KB7. optimal values of OTDR, Power meter and light meter test results</p> <p>KB8. functionality of passive infrastructure equipments like DG set, PIU panel, Transformer, SMPS, Air Conditioner, Battery</p>

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Undertake Condition based Maintenance & Planned repair activities

	<p>KB9. need and requirement of earthing the equipments</p> <p>KB10. mechanism to maintain the earthing pit to absolute zero</p> <p>KB11. utility of As made route diagrams</p> <p>KB12. standard trenching, cable laying, pit preparation, splicing, jointing, blowing and back-filling process for installation of OFC cables</p> <p>KB13. different types of OFC connectors based on the type of equipments</p> <p>KB14. standard maintenance process for optical fiber cables and STM equipments</p>
Skills (S)	
A. Core Skills/ Generic Skills	Basic Reading & Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. fill up appropriate technical forms, activity logs in required format of the company</p> <p>SA2. maintain proper records as per given format</p> <p>SA3. read and understand manuals, work orders, health and safety instructions, memos, reports etc.</p>
	Communication Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA4. liaise and coordinate with third party vendors</p> <p>SA5. communicate with supervisor and peers</p> <p>SA6. communicate in the local language</p>
	Project Management Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. prioritize and execute tasks in a high-pressure environment and handle high pressure situations</p> <p>SA8. handle multiple tasks and completing them successfully within due timelines</p> <p>SA9. use and maintain resources efficiently and effectively</p> <p>SA10. be flexible and accept changes in job requirements, schedules, or work environments</p>
	Other Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA11. interpret test reports, as made route diagrams and other numerical data</p> <p>SA12. create and maintain effective working relationships and team environment</p> <p>SA13. take initiatives and progressively assume increased responsibilities</p> <p>SA14. share knowledge with other team members and colleagues</p>
B. Professional Skills	Equipment operating Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. utilize appropriate optical equipments like cleaver, mechanical and fusion splicing kit, protection sleeves, fiber stripper, fiber reinforced plaster during splicing and jointing</p> <p>SB2. operate optical test equipments like OTDR and power meter</p> <p>SB3. operate passive infrastructure equipments like DG set, PIU panel, Earthing</p>

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Undertake Condition based Maintenance & Planned repair activities

	systems, Transformer, SMPS, Air Conditioner, Battery
	OFC splicing and splice testing skills
	The user/individual on the job needs to know and understand how to:
	SB4. carry out splicing in a manner ensuring minimum reflectance loss, optical return loss, insertion loss
	SB5. perform optical link testing as per standard process
	SB6. utilize appropriate optical test equipments like OTDR, power meter based on test requirements
	SB7. perform OTDR test as per standard process and summarize OTDR reports for records and review
	SB8. perform Power meter tests as per standard process and identify instances of cross-fibres
	SB9. appropriately mark/ tag cables to identify direction and route
	SB10. utilize suitable OFC connectors are used based on the termination equipment
	Technical interpretation Skills
	The user/individual on the job needs to know and understand how to:
	SB11. identify appropriate cables for splicing based on sequence or color coding to avoid occurrence of instances of cross fibers
	SB12. interpret As made documents and perform update based on actual cable routes, joints
	SB13. interpret OTDR and power meter test results to identify and localize faults and/ or measure optical losses
	SB14. interpret optical link testing results to ensure link margins
	Problem solving skills
	The user/individual on the job needs to know and understand how to:
	SB15. utilize appropriate tools and commands to rectify faults
	SB16. utilize appropriate communication channels to escalate unresolved problems to relevant personnel

NOS Version Control

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Credits(NVEQF/NVQF/NSQF) [OPTIONAL]	TBD	Version number	1.0
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Industry Sub-sector	Network Managed Services	Last reviewed on	21/06/13
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National Occupational Standard



Overview

This unit is about carrying out corrective maintenance/ fault management of OFC to ensure network availability and high quality network transmission

National Occupational Standard	Unit Code	TEL/N6404
	Unit Title (Task)	Perform corrective maintenance/ restoration of optical faults
	Description	This unit is about carrying out corrective maintenance/ fault management of OFC to ensure network availability and high quality network transmission. It is critical to ensure timely response to work orders and implement the change appropriately.
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Ensure timely response to the change work orders • Implement change work order and test effectiveness of change • Reporting and documenting the status
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Handling fault notifications on prompt basis	<p>To be competent, the user/individual on the job must be able to</p> <p>PC1. receive fault notification from NOC/ supervisors/ customers and obtain details of response time/ SLAs</p> <p>PC2. ensure that latest As-build drawing is obtained from the NOC/ supervisors</p>
	Arrange for tools and spares	<p>PC3. ensure availability of test equipments like OTDR and Power meter for carrying out optical tests</p> <p>PC4. ensure availability of optical equipments like spool, joint closure, connectors, splicers and cleaver</p> <p>PC5. ensure that faulty equipments are sent to logistics team for repair and replacement</p> <p>PC6. ensure calibration status of equipments to be used (eg.splicing machine, OTDR, power meter, cleaver)</p>
	Fault localization and rectification	<p>PC7. visit nearby POP location/ node and carry out OTDR tests on spare fiber using spool fiber if required, to identify exact location of fault</p> <p>PC8. refer the As-build drawing to locate the physical site on the ground</p> <p>PC9. coordinate excavation, pulling of appropriate cables (if feasible) and preparation of jointing pit at site through labour workers</p> <p>PC10. coordinate with optical splicer to carry out splicing as per standard process</p> <p>PC11. ensure effectiveness of the jointing activity by reviewing OTDR and power test results</p> <p>PC12. ensure joints are protected and strenghtened appropriately using couplers, spleaves and FRPs as required</p> <p>PC13. verify if ducts require additional protection like cover of RCC pipes, chambering and concreting based on site location and terrain</p> <p>PC14. coordinate back-filling of the trench through labor workers</p> <p>PC15. ensure rectification of network problem/ fault within the alarm SLAs</p>

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	<p>PC16. ensure timely completion of work by monitoring activities performed by the labour workers and optical splicers</p> <p>PC17. ensure compliance to enterprise policy while escalating unresolved faults/ instances of delays</p>
<p>Health and Safety</p>	<p>PC18. ensure appropriate disposal of the cut fibers, sleeves and cable pieces</p> <p>PC19. ensure compliance with site risk control, OHS, environmental and quality requirements as per company's norms</p> <p>PC20. ensure that work is carried out in accordance to the level of competence and legal requirements</p> <p>PC21. ensure that sites are assessed for health and safety risk as per company's guidelines prior to commencement of work</p> <p>PC22. ensure compliance to health and safety guidelines by optical splicer and installation labour workers</p> <p>PC23. ensure that Personal protection equipments like helmets, knee pads, safety boots, safety glasses and trench guards are appropriately used as required</p> <p>PC24. ensure environmental conditions and hazards like Earth Potential Rise (EPR) are considered while carrying out the work</p> <p>PC25. ensure escalation of safety incidents to relevant authorities as per guidelines legal requirements</p>
<p>Report & Record</p>	<p>PC26. ensure appropriate cable marking and Installation of chamber & route marker for direction and route identification</p> <p>PC27. ensure preparation of jointing record for future reference</p> <p>PC28. ensure that documents that are required to be updated are identified</p> <p>PC29. ensure completion of OTDR register showing complete record of jointing tests</p>
<p>Knowledge and Understanding (K)</p>	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. risk and impact of not following defined procedures/work instructions</p> <p>KA2. escalation matrix for reporting identified incidents, troubles and/ or emergencies e.g. system failures ,fire and power failures</p> <p>KA3. types of documentation in organization and importance of the same</p> <p>KA4. records to be maintained and implications of non-maintenance of the same</p> <p>KA5. knowledge of spare management and repair & return process for faulty equipments</p> <p>KA6. SHE and OHS guidelines and regulations as per company's norms</p> <p>KA7. personal protection equipments like helmets, knee pads, safety boots, safety glasses and trench guards that are required to be used</p> <p>KA8. first aid requirements in case of electrical shocks, cuts, fall and other common injuries</p> <p>KA9. electrical and chemical, environmental related hazards and precautionary measures</p> <p>KA10. usage of fire safety equipments</p>

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<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. principles of optical transport media and OFC communication</p> <p>KB2. knowledge of Optical fiber characteristics like refraction, polarization, attenuation, dispersion</p> <p>KB3. bands in optical fibre and their usability, loss characteristics</p> <p>KB4. signal strength and quality KPIs – design values and margins</p> <p>KB5. functionality of optical equipments like cleaver, mechanical and fusion splicing kit, protection sleeves, fiber stripper, fiber reinforced plaster during splicing and jointing</p> <p>KB6. functionality of optical test equipments like OTDR and power meter</p> <p>KB7. optimal values of OTDR, Power meter and light meter test results</p> <p>KB8. utility of As made route diagrams</p> <p>KB9. standard trenching, cable laying, pit preparation, splicing, jointing, blowing and back-filling process for installation of OFC cables</p> <p>KB10. different types of OFC connectors based on the type of equipments</p> <p>KB11. standard process and need for performing duct integrity tests like air tightness tests and kink free tests</p>
	<p>Skills (S)</p>
<p>A. Core Skills/ Generic Skills</p>	<p>Basic Reading & Writing Skills</p>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. fill up appropriate technical forms, activity logs in required format of the company</p> <p>SA2. maintain proper records as per given format</p> <p>SA3. read and understand manuals, work orders, health and safety instructions, memos, reports etc.</p>
	<p>Communication Skills</p>
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA4. liaise and coordinate with third party vendors</p> <p>SA5. communicate with supervisor and peers</p> <p>SA6. communicate in the local language</p>
	<p>Project Management Skills</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. prioritize and execute tasks in a high-pressure environment and handle high pressure situations</p> <p>SA8. handle multiple tasks and completing them successfully within due timelines</p> <p>SA9. use and maintain resources efficiently and effectively</p> <p>SA10. be flexible and accept changes in job requirements, schedules, or work environments</p>
<p>Other Skills</p>	

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	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA11. interpret test reports, as made route diagrams and other numerical data</p> <p>SA12. create and maintain effective working relationships and team environment</p> <p>SA13. take initiatives and progressively assume increased responsibilities</p> <p>SA14. share knowledge with other team members and colleagues</p>
<p>B. Professional Skills</p>	<p>Equipment operating Skills</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. utilize appropriate optical equipments like cleaver, mechanical and fusion splicing kit, protection sleeves, fiber stripper, fiber reinforced plaster during splicing and jointing</p> <p>SB2. operate optical test equipments like OTDR and power meter</p> <p>SB3. operate passive infrastructure equipments like DG set, PIU panel, Earthing systems, Transformer, SMPS, Air Conditioner, Battery</p>
	<p>OFC splicing and splice testing skills</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. carry out splicing in a manner ensuring minimum reflectance loss, optical return loss, insertion loss</p> <p>SB5. perform optical link testing as per standard process</p> <p>SB6. utilize appropriate optical test equipments like OTDR, power meter based on test requirements</p> <p>SB7. perform OTDR test as per standard process and summarize OTDR reports for records and review</p> <p>SB8. perform Power meter tests as per standard process and identify instances of cross-fibres</p> <p>SB9. utilize suitable OFC connectors are used based on the termination equipment</p>
	<p>Technical interpretation Skills</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB10. identify appropriate cables for splicing based on sequence or color coding to avoid occurrence of instances of cross fibers</p> <p>SB11. interpret As made documents and perform update based on actual cable routes, joints</p> <p>SB12. interpret OTDR and power meter test results to identify and localize faults and/or measure optical losses</p> <p>SB13. interpret optical link testing results to ensure link margins</p>
	<p>Problem solving skills</p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB14. utilize appropriate tools and commands to rectify faults</p> <p>SB15. utilize appropriate communication channels to escalate unresolved problems to relevant personnel</p>

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