



Powerline Technician

On-the-Job Training Guide

2024

1-877-363-0536
apprenticeship@gov.sk.ca
saskapprenticeship.ca



Online: www.saskapprenticeship.ca

Recognition:

To promote transparency and consistency, this document has been adapted from the 2018 Powerline Technician Red Seal Occupational Standard (Employment and Social Development Canada).

A complete version of the Occupational Standard can be found at www.red-seal.ca

STRUCTURE OF THE ON-THE-JOB TRAINING GUIDE

To facilitate understanding of the occupation, this on-the-job training guide contains the following sections:

Description of the Powerline Technician trade: an overview of the trade's duties and training requirements.

Essential Skills Summary: an overview of how each of the nine essential skills is applied in this trade.

Harmonization: a brief description on the Pan-Canadian Harmonization Initiative for the Powerline Technician trade.

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this standard detailing the essential skills and the level of training where the content is covered.

Major Work Activity (MWA): the largest division within the standard that is comprised of a distinct set of trade activities.

Task: distinct actions that describe the activities within a major work activity.

Sub-task: distinct actions that describe the activities within a task.

On-the-Job and In-school Training Content for the Powerline Technician Trade: a chart which outlines on-the-job examples for apprentices to achieve relevant work experience to prepare for topics of technical training.

DESCRIPTION OF THE POWERLINE TECHNICIAN TRADE

Powerline technicians construct, operate, maintain and repair overhead and underground electrical transmission and distribution systems. They erect and maintain steel, wood, fibreglass, laminate and concrete poles, structures and other related hardware. They install, maintain and repair overhead and underground powerlines and cables, and other associated equipment such as insulators, conductors, lightning arrestors, switches, metering systems, transformers and lighting systems. They splice and terminate conductors and related wiring to connect power distribution and transmission networks. In some jurisdictions, powerline technicians may also install underwater cables and install/transfer communication cables.

Powerline technicians are employed by electric power generation, transmission or distribution companies, electrical contractors and public utility commissions. In larger utilities, powerline technicians may also specialize in one of the following areas: transmission lines, overhead or underground distribution systems, communication networks and electrical power stations.

Powerline technicians require good communication skills to coordinate and facilitate work with customers, co-workers and other trades. They also require strong analytical skills in order to read and interpret diagrams, drawings and specifications. They must have good mechanical aptitude to install, troubleshoot and repair equipment. They must also have good vision and the ability to distinguish colours. The ability to adapt to change and a willingness to keep up with new developments is important to this trade.

Powerline technicians work outdoors at various worksites, at any hour and in any weather. The work always involves travel to and from the worksite, which is often in remote areas, necessitating the use of a variety of access equipment such as all-terrain vehicles, snowmobiles, aircrafts and watercrafts. Occupational hazards in this trade are working with high voltage equipment, working in confined spaces and working at heights. The work may be strenuous and requires frequent heavy lifting, working in awkward positions, carrying and reaching. Getting to powerlines requires climbing poles and structures, working from a bucket attached to an aerial lift boom and entering maintenance holes and underground vaults. Other inherent occupational hazards in this trade are electrical shocks, working in confined spaces and falling.

This analysis recognizes similarities or overlaps with the work of construction electricians and industrial electricians. Powerline technicians work with a wide variety of tradespersons, engineers and inspectors.

With experience, powerline technicians may act as mentors and trainers to apprentices in the trade. They may advance to senior journeyman, foreperson, supervisory or managerial positions. They can also transfer their skills to related occupations in areas such as design, planning, safety, technical support services and system control.

Training Requirements: 7200 hours and 4 levels of technical training sessions at the Southeast College training facility in Weyburn. An apprentice must successfully complete the required technical training and compile enough on-the-job experience to total at least 1800 hours each year.

The following list comprises of the technical training days delivered by Southeast College at their training facility in Weyburn, Saskatchewan:

Level One:	12 days
Level Two:	10 days
Level Three:	12 days
Level Four:	10 days

It is the employer’s or journeyperson’s training responsibility to supervise an apprentice’s practical skills development until a satisfactory level of proficiency has been reached.

The information contained in this document serves as a guide for employers and apprentices. Apprenticeship training is mutually beneficial to both employer and apprentice. The employer’s investment in training apprentices results in skilled and certified workers. The document summarizes the tasks to be covered by the apprentice during their on-the-job portion of apprenticeship training. An apprentice spends approximately 85% of their apprenticeship term training on-the-job.

Entrance Requirements for Apprenticeship Training

Your grade twelve transcripts (with no modified classes) or GED 12 is your guarantee that you meet the educational entrance requirements for apprenticeship in Saskatchewan. In fact, employers prefer and recommend apprentices who have completed high school. This ensures the individual has all of the necessary skills required to successfully complete the apprenticeship program, and receive journeyman certification.

Individuals with “modified” or “general” classes in math or science do not meet our entry requirements. These individuals are required to take an entrance assessment prescribed by the SATCC.

English is the language of instruction in all apprenticeship programs and is the common language for business in Saskatchewan. Before admission, all apprentices and/or “upgraders” must be able to understand and communicate in the English language. Applicants whose first language is not English must have a minimum Canadian Language Benchmark Assessment of six (CLB6).

Note: A CLB assessment is valid for a one-year period from date of issue.

Designated Trade Name	Math Credit at the Indicated Grade Level❶	Science Credit at Grade Level
Powerline Technician	Grade 11	Grade 10
<p>❶ - (One of the following) WA – Workplace and Apprenticeship; or F – Foundations; or P – Pre-calculus, or a Math at the indicated grade level (Modified and General Math credits are not acceptable.).</p> <p>*Applicants who have graduated in advance of 2015-2016, or who do not have access to the revised Science curricula will require a Science at the minimum grade level indicated by trade.</p> <p>For information about high school curriculum, including Math and Science course names, please see: http://www.curriculum.gov.sk.ca/#</p> <p>Individuals not meeting the entrance requirements will be subject to an assessment and any required training</p>		

ESSENTIAL SKILLS SUMMARY

Essential skills are needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.

Through extensive research, the Government of Canada and other national and international agencies have identified and validated nine essential skills. These skills are used in nearly every occupation and throughout daily life in different ways.

A series of CCDA-endorsed tools have been developed to support apprentices in their training and to be better prepared for a career in the trades. The tools can be used independently or with the assistance of a tradesperson, trainer, employer, teacher or mentor to:

- understand how essential skills are used in the trades;
- learn about individual essential skills strengths and areas for improvement; and
- improve essential skills and increase success in an apprenticeship program.

The tools are available online or for order at: www.esdc.gc.ca/eng/jobs/les/profiles/index.shtml

The application of these skills may be described throughout this document within the skills and knowledge which support each sub-task of the trade. The most important essential skills for each sub-task have also been identified. The following are summaries of the requirements in each of the essential skills, taken from the essential skills profile. A link to the complete essential skills profile can be found at www.red-seal.ca.

READING

Powerline technicians read short notes on drawings and forms that contain technical information related to construction standards or specifications. They read emails and other correspondence from manufacturers or electrical grid personnel to stay informed on issues. They consult textbooks to determine steps to take when encountering new or infrequent tasks. They also consult summaries of the Highway Traffic Act to prepare for work on public roads. Powerline technicians also read a variety of code books, standards and regulations to ensure work is done in compliance with industry standards.

DOCUMENT USE

Powerline technicians read information on lists, logbooks and timesheets, and they scan work orders for information about current projects such as job location, job description, timelines, scheduling, contractor requirements, project hazards and project contacts. They use area maps and equipment identification codes to identify their work location. They complete forms to track the disposal of hazardous materials. They interpret symbols and codes on construction drawings, and use schematic drawings to assemble a piece of equipment or to isolate a circuit. Powerline technicians use information taken from tables and charts to perform calculations such as voltage drop or appropriate conductor sag.

WRITING

Powerline technicians keep a daily logbook containing reminders and notes about job progress, deliveries, weather conditions and unusual occurrences. They may prepare training evaluations, switching authorizations and work protection documents. They document safety hazards and precautions or measures taken to mitigate potential hazards.

ORAL COMMUNICATION

Powerline technicians communicate with dispatchers to exchange information about work in progress or to obtain new assignments, and with supervisors and other crew members several times a day to share crucial information about tasks that need to be completed and unforeseen problems. They maintain constant contact with all crew members during operations to ensure safety of all workers. Powerline technicians interact with property owners, the general public and various contractors. They also explain and demonstrate safe working techniques to new employees.

NUMERACY

Powerline technicians estimate time and verify or determine materials and equipment required for a job. They calculate to what depth to bury poles, the weight of a load to be rigged, fuse size, the tension and angle of guy wires, and the average kilowatt demand for a building. Powerline technicians work in both metric and imperial systems of measurement and must be able to convert between the two systems.

THINKING

Powerline technicians use problem solving skills to determine how to proceed with an installation when safety hazards or unforeseen obstructions present themselves. They identify the people such as fire fighters, police, city representatives, tenants and dispatchers, who need to be consulted to determine course of action when faced with emergencies such as downed wires or traffic lights, and storms.

Powerline technicians use decision making skills to decide alternate work activities to be completed when weather prevents outside work. They decide on the suitability of materials and proper procedures to follow to accomplish tasks in a safe and efficient manner. Powerline technicians establish critical timelines for assigned projects keeping in mind that electrical power must be restored as quickly as possible.

WORKING WITH OTHERS

Powerline technicians work as part of a crew to perform critical and often highly hazardous work; therefore, collaboration is crucial. They participate in formal and informal discussions with co-workers and supervisors about work processes. They monitor the work of others and may assign tasks to them or inform them how to perform a task.

DIGITAL TECHNOLOGY

Powerline technicians use communications software such as email to communicate with supervisors. They may access the Internet to obtain information, or to review electrical schematics or construction drawings. They also use other computer applications such as GIS software to locate or place powerline devices or components.

CONTINUOUS LEARNING

Powerline technicians need to maintain and upgrade their skills and knowledge of industry standards and regulations by attending educational sessions or courses offered by provincial or federal associations. Powerline technicians must also maintain their safety certifications such as cardiopulmonary resuscitation (CPR) and First Aid. They also learn from experienced co-workers.

ELEMENTS OF HARMONIZATION FOR APPRENTICESHIP TRAINING

At the request of industry, the Harmonization Initiative was launched in 2013 to *substantively align* apprenticeship systems across Canada by making training requirements more consistent in the Red Seal trades. Harmonization aims to improve the mobility of apprentices, support an increase in their completion rates and enable employers to access a larger pool of apprentices.

As part of this work, the Canadian Council of the Directors of Apprenticeship (CCDA) identified four main harmonization priorities in consultation with industry and training stakeholders:

1. Trade name

The official Red Seal name for this trade is Powerline Technician.

2. Number of Levels of Apprenticeship

The number of levels of technical training recommended for the Powerline Technician trade is four.

3. Total Training Hours during Apprenticeship Training

The total hours of training, including both on-the-job and in-school training for the Powerline Technician trade is 7200.

4. Consistent sequencing of training content (at each level) using the most recent Occupational Standard

Implementation for harmonization will take place progressively. Level one was implemented in 2020/2021, level two 2021/2021, level three 2022/2023, and level four in 2023/2024.

POWERLINE TECHNICIAN

TASK MATRIX CHART

This chart outlines the major work activities, tasks and sub-tasks from the 2018 Powerline Technician Red Seal Occupational Standard. Each sub-task details the corresponding essential skill and level of training where the content is covered. *

* Sub-tasks with numbers in the boxes is where the content will be delivered in training. The Task Matrix Chart will be updated every year until Harmonization implementation is complete. Implementation for harmonization will take place progressively. Level one was implemented in 2020/2021, level two 2021/2021, level three 2022/2023, and level four in 2023/2024. See Appendix A for the finalized curriculum comparisons.

A – Performs routine occupational skills

26%

A-1 Performs safety-related functions	1.01 Uses personal protective equipment (PPE) and safety equipment 1 (2, 3, 4 in-context)	1.02 Controls powerline hazards 1 (2, 3, 4 in-context)	1.03 Controls environmental hazards 1 (2, 3, 4 in-context)	1.04 Performs lock-out and tag-out procedures 1 (2, 3, 4 in-context)	1.05 Performs temporary grounding and bonding procedures 1 (2, 3, 4 in-context)
A-2 Uses and maintains tools and equipment	2.01 Uses hand, power and powder-actuated tools and equipment 1 (2, 3, 4 in-context)	2.02 Uses electrical measuring and testing equipment 1 (2, 3, 4 in-context)	2.03 Uses rigging, hoisting and lifting equipment 1 (2, 3, 4 in-context)		
A-3 Organizes work	3.01 Interprets plans, drawings and specifications 1 (2, 3, 4 in-context)	3.02 Prepares worksite 1 (2, 3, 4 in-context)	3.03 Plans job tasks and procedures 1 (2, 3, 4 in-context)		
A-4 Accesses work area	4.01 Climbs poles and steel lattice structures 1	4.02 Uses access equipment 1	4.03 Uses on- and off-road equipment 1		
A-5 Uses live-line methods	5.01 Uses cover-up 1, 2, 3, 4	5.02 Uses rubber gloves 1, 2, 3, 4	5.03 Uses bare-hand methods (Not Common Core) 4	5.04 Uses fibreglass reinforced plastic (FRP) tools (hot sticks) 1, 2, 3, 4	

A-6 Uses communication and mentoring techniques	6.01 Uses communication techniques 1	6.02 Uses mentoring techniques 4
--	--	--

B – Installs structures

13%

B-7 Installs pole structures	7.01 Frames pole structures 1	7.02 Sets pole structures 1	7.03 Installs pole structure guys and anchors 1		
B-8 Installs steel lattice structures	8.01 Assembles steel lattice structures 1	8.02 Erects steel lattice structures 1	8.03 Installs steel lattice structure guy wires and anchors 1		

C – Installs conductor systems

15%

C-9 Installs overhead conductors and cables	9.01 Strings overhead conductors and cables 1, 2, 3, 4	9.02 Sags overhead conductors and cables 1, 2, 3, 4	9.03 Ties-in overhead conductors and cables 1, 2, 3, 4	9.04 Installs splices and connections to overhead conductors and cables 1, 2, 3, 4
C-10 Installs underground and underwater cable	10.01 Installs conduit and cable 2, 3	10.02 Places direct buried cable 2, 3	10.03 Splices underground and underwater cable 2, 3	10.04 Terminates underground and underwater cable 2, 3

D – Installs auxiliary equipment

21%

D-11 Installs lighting systems	11.01 Installs street lights 2	11.02 Maintains street lights 2
---------------------------------------	--	---

D-12 Installs voltage control equipment	12.01 Installs transformers 1, 2, 3	12.02 Installs capacitors 4	12.03 Installs voltage regulators 3, 4	12.04 Installs switches 1, 2, 3	12.05 Installs reactors (Not Common Core) 4
D-13 Installs protection equipment	13.01 Installs reclosers 3, 4	13.02 Installs sectionalizers 3, 4	13.03 Installs fuses 2, 3, 4	13.04 Installs lightning arrestors 2	
D-14 Installs metering equipment	14.01 Installs primary metering equipment 3	14.02 Installs secondary metering equipment 2			
D-15 Installs communication devices	15.01 Installs cellular antennas 4	15.02 Transfers communication lines 1			

E – Performs operation, maintenance and repair

25%

E-16 Operates distribution and transmission systems	16.01 Operates transmission systems 3, 4	16.02 Operates distribution systems 2, 4	16.03 Performs station switching 4		
E-17 Maintains distribution and transmission systems	17.01 Inspects distribution and transmission systems 3, 4	17.02 Maintains pole structures 2, 3, 4	17.03 Maintains steel lattice structures 4	17.04 Maintains system components 2, 3, 4	17.05 Trims trees 2
E-18 Repairs distribution systems	18.01 Troubleshoots overhead distribution systems 3, 4	18.02 Troubleshoots underground and underwater distribution systems 3, 4	18.03 Repairs overhead distribution systems 2, 3, 4	18.04 Repairs underground and underwater distribution systems 2, 3, 4	
E-19 Repairs transmission systems	19.01 Troubleshoots overhead transmission systems 3, 4	19.02 Troubleshoots underground and underwater transmission systems 3, 4	19.03 Repairs overhead transmission systems 2, 3, 4	19.04 Repairs underground and underwater transmission systems 2, 3, 4	

ON-THE-JOB AND IN-SCHOOL TRAINING

CONTENT FOR THE POWERLINE TECHNICIAN

TRADE

This chart outlines on-the-job examples for apprentices to achieve relevant work experience to prepare for the topics of technical training. Topics of technical training are provided with the associated learning outcomes.

Level One	12 Days	127 hours
Safety <ul style="list-style-type: none"> demonstrate knowledge of safety equipment, their applications, maintenance and procedures for use demonstrate knowledge of safe work practices demonstrate knowledge of regulatory requirements pertaining to safety demonstrate knowledge of lock-out and tag-out procedures, their applications and use <p>Mentors can assist the apprentice to prepare for this section of technical training by:</p> <ul style="list-style-type: none"> familiarizing the apprentice with safety rules such as Minimum Approach Distance, Standard Protection Code, Apprentice Qualifications, Right to Refuse Hazardous Work. providing WHMIS and OH&S training. familiarizing apprentices with the use of a Modiewark (proximity voltage detector) and testing for absence of potential. identifying lock-out and tag-out requirements and coordinating the process with appropriate authorities, other trades and work groups. familiarizing the apprentice with the procedures used to test for potential on isolated lines with the proper voltage-rated equipment. documenting with the apprentice the lock-out and tag-out process for future reference. 		SFTY 100
Temporary Bonding and Grounding <ul style="list-style-type: none"> demonstrate knowledge of grounding and bonding methods and equipment demonstrate knowledge of the procedures used to install, inspect and maintain grounding and bonding systems <p>Mentors can assist the apprentice to prepare for this section of technical training by:</p> <ul style="list-style-type: none"> familiarizing the apprentice with a variety of tools and equipment used to perform temporary grounding and bonding. familiarizing the apprentice with minimum approach distances (MAD) from second point of contact. ensuring the apprentice maintains minimum approach distances (MAD). familiarizing the apprentice with the procedures to perform a potential check. familiarizing the apprentice with the procedures to install/remove/maintain temporary grounding and bonding equipment. 		BOND 100

Tools and Equipment

TOOL 100

- demonstrate knowledge of tools and equipment, their applications, maintenance and procedures for use ground resistance testing

Mentors can assist the apprentice to prepare for this section of technical training by:

- *exposing the apprentice to industry standard tools, components and materials.*
- *providing direction on the use, care, storage and maintenance of tools and equipment.*
- *familiarizing apprentices with proper techniques and positioning when using various tools.*

Electrical Measuring

EMSR 100

- demonstrate knowledge of power and energy, their characteristics and associated principles
- demonstrate knowledge of units of measure and symbols relating to power and energy
- demonstrate knowledge of the instruments and procedures used to measure power and energy

Mentors can assist the apprentice to prepare for this section of technical training by:

- *ensuring the apprentice is exposed to layout and troubleshooting of basic circuits, providing hands-on experience interpreting schematics and using multimeters and other electronic measuring devices.*
- *identifying instruments used for measuring electricity and describe their applications and procedures for use.*
- *identifying instruments used for measuring.*
- *identifying safety requirement such as identifying limits of approach to and appropriate Personal Protective Equipment (PPE) when using electronic measuring devices on energized circuits.*

Rigging, Hoisting and Lifting

RIGG 100

- demonstrate knowledge of rigging, hoisting and lifting equipment, their applications, limitations and procedures for use
- demonstrate knowledge of basic rigging, hoisting and lifting techniques

Mentors can assist the apprentice to prepare for this section of technical training by:

- *familiarizing the apprentice with a variety of rigging components, techniques, knots.*
- *providing training in hand signals.*

Job Planning and Organization

JOBP 100

- demonstrate knowledge of drawings, schematics and specifications and their applications
- demonstrate knowledge of interpreting and extracting information from drawings, basic schematics and specifications
- demonstrate knowledge of grid map reading
- demonstrate knowledge of the procedures used to find a land location on a map
- demonstrate knowledge of traffic control equipment, their applications, maintenance and procedures for use
- demonstrate knowledge of traffic control techniques and procedures
- demonstrate knowledge of job tasks, procedures, and the order in which they are completed
- demonstrate knowledge of different communication techniques, their applications and use

Mentors can assist the apprentice to prepare for this section of technical training by:

- *involving the apprentices in measuring, laying-out, staking, overhead and underground lines according to design criteria.*
- *familiarizing apprentices with the construction standards manual to find appropriate dimensions for framing structures, installing conductors and mounting serialized equipment.*
- *creating situations where skills can be practiced safely by the apprentice.*
- *passing on best practice procedures through supportive and/or corrective feedback.*

Pole Climbing, Decay and Decay Calculations

POLE 100

- demonstrate knowledge of pole decay and decay calculations, their application and use
- demonstrate knowledge of how to tag and stub a pole, its application and use
- demonstrate knowledge of pole climbing, its applications, limitations and procedures for use
- demonstrate knowledge of pole climbing equipment, its applications, limitations and procedures for use

Mentors can assist the apprentice to prepare for this section of technical training by:

- *identifying hazards and describing safe work practices pertaining to pole structure climbing and pole climbing equipment.*
- *identifying pole climbing equipment and describing their characteristics and applications.*
- *identifying codes and regulations pertaining to pole climbing equipment.*
- *reinforcing the importance of conducting a pre-climbing pole inspection.*
- *describing the procedures used to perform pole top rescues.*

Work Area Access

ACES 100

- demonstrate knowledge of ladders, their applications, limitations and procedures for use
- demonstrate knowledge of aerial devices, their applications and operation
- demonstrate knowledge of basic hydraulic principles
- demonstrate knowledge of hydraulic equipment components, their applications and operation
- demonstrate knowledge of on- and off-road equipment, their applications, maintenance and operating procedures

Mentors can assist the apprentice to prepare for this section of technical training by:

- *identifying hazards and describing safe work practices pertaining to access equipment.*
- *describing procedures used to erect and remove access equipment.*
- *familiarizing the apprentice with the selection of equipment according to job requirements.*
- *familiarizing the apprentice with the procedures used to inspect and ensure safe operation of access equipment.*

Live Line Methods (Introduction)

LLMI 100

- demonstrate knowledge of the principles of live line work
- demonstrate knowledge of the procedures used to perform live line work
- demonstrate knowledge of rubber gloves, their applications, maintenance and use
- demonstrate knowledge of insulating sticks, their applications, maintenance and use

Mentors can assist the apprentice to prepare for this section of technical training by:

- *verifying valid test date or expiration date of rubber gloves.*
- *performing air and roll tests.*
- *understanding the different classification of gloves.*
- *understanding the proper positioning and distance to maintain MAD.*
- *defining terminology associated with liveline work using FRP tools (hot sticks).*
- *identifying hazards and describing safe work practices pertaining to live-line work using FRP tools (hot sticks).*

Overhead Distribution Structures (Introduction)

OHDS 100

- demonstrate knowledge of overhead system construction principles
- demonstrate knowledge of different poles and the procedures to properly setting a pole
- demonstrate the knowledge of the angles and lengths involved in tensioning lines and equipment

Mentors can assist the apprentice to prepare for this section of technical training by:

- *familiarizing apprentices with the appropriate line hardware and devices used in building and maintaining overhead and underground facilities.*
- *familiarizing apprentices with pole stamp information and ensuring pole meets engineering standards.*
- *demonstrating an installation of a ground wire on pole structure to provide a path to ground according to engineering standards and jurisdictional regulations.*
- *identifying the tools and equipment used to set pole structures according to job requirements.*
- *demonstrating the procedures used to plumb and secure a pole.*
- *demonstrating the procedure to set structure guys and anchors.*

Steel Lattice Structures

SLAT 100

- demonstrate knowledge of steel lattice structures, their applications and use
- demonstrate knowledge to assemble, erect and install steel lattice structures

Mentors can assist the apprentice to prepare for this section of technical training by:

- *familiarizing the apprentice with the correct tools and equipment need to assemble steel lattice structures.*
- *familiarizing the apprentice with the procedures used to secure the base or structure of a steel lattice pole on a footing.*
- *demonstrating the procedure to use temporary guy wires to ensure stability during erection.*

Overhead Conductors and Cables

OHCC 100

- demonstrate knowledge of the effects of sagging on conductors
- demonstrate knowledge of the procedures used to sag conductors
- demonstrate knowledge of conductors and cables and their associated components
- demonstrate knowledge of methods of cable protection and their applications
- demonstrate knowledge of the procedures used to mechanically protect and support cables

Mentors can assist the apprentice to prepare for this section of technical training by:

- *defining terminology associated with sagging overhead conductors and cables.*
- *defining terminology associated with splices connections for overhead conductors and cables.*
- *identify types and sizes of overhead conductors and cables and describe their characteristics and applications.*
- *demonstrating proper techniques and positioning for stringing and tying in conductors using travelers.*
- *familiarizing apprentices on the various types of conductor ties and proper installation of each type.*
- *familiarizing apprentices with the various line configurations and insulation requirements.*
- *familiarizing apprentice with the procedures to set up and operate stringing equipment.*
- *identify conductor and cable protection methods and describe their characteristics, procedures and applications.*

Overhead Distribution Systems (Introduction)

OSYS 100

- demonstrate knowledge of transformer operating principles
- transformer components, their applications and operation
- demonstrate knowledge of the procedures used to install and maintain transformers
- demonstrate knowledge of managing hazardous materials associated with transformers
- demonstrate knowledge of the procedures used to install, connect, inspect, maintain, repair, troubleshoot and test overhead system components and accessories
- demonstrate knowledge of switches and select appropriate switches for their application

Mentors can assist the apprentice to prepare for this section of technical training by:

- *identifying tools and equipment to install transformers are selected and used according to job requirements.*
- *demonstrating the proper procedures to make wiring connections in a single-phase transformer.*
- *familiarizing apprentices with the procedure to check voltage and phase rotation.*
- *identifying the different types of power transformers and their applications.*
- *interpreting information pertaining to transformer banking found on nameplates, drawings and specifications.*
- *identifying hazards and describing safe work practice pertaining to transformer work.*

Trade Mathematics and Electrical Theory

TMET 100

- demonstrate knowledge of basic mathematical principles, their use and applications
- demonstrate knowledge of the different units of measure used in industry
- demonstrate knowledge of fundamental electrical principles
- demonstrate knowledge of basic DC series and parallel circuits
- demonstrate knowledge of single-phase circuits, their characteristics and operation
- demonstrate knowledge of electromagnetic induction, its characteristics and applications

Mentors can assist the apprentice to prepare for this section of technical training by:

- *performing calculations to analyze and measure electrical circuit values.*
- *defining terminology associated with electrical characteristics.*
- *explaining the atomic structure of matter and electron theory.*
- *identifying the forms of energy that produce electricity and describing their associated principles.*
- *describing basic electric circuits.*
- *identifying basic components found in electric circuits and describing their characteristics and purposes.*
- *identifying the basic electrical properties and describing their relationship.*
- *identifying the forms of energy that produce electricity and describing their associated principles.*
- *describing basic electric circuit characteristics.*

Level Two

10 days

112 hours

Live Line Methods

LLMI 200

- demonstrate knowledge of the principles of live line work
- demonstrate knowledge of the procedures used to perform live line work
- demonstrate knowledge of insulating sticks, their applications, maintenance and use
- demonstrate knowledge of principles of live-line work using cover-up resistance and inductive reactance in an AC circuit
- demonstrate knowledge of procedures to use cover-up

Mentors can assist the apprentice to prepare for this section of technical training by:

- *explaining the principles of operations and applications of insulated tools, hotsticks, conductor supports and tensioning tools.*
 - *demonstrating the safe use of insulated hand tools, hotsticks, conductor supports and live line tensioning tools.*
 - *familiarizing the apprentice with inspection maintenance, care, use and storage of the various types of sticks and attachments.*
-

Overhead Conductors and Cables (Tension Stringing)

OHCC 200

- demonstrate knowledge of the effects of sagging on conductors
- demonstrate knowledge of the procedures used to sag conductors
- demonstrate knowledge of overhead conductors and cables, their characteristics and applications
- demonstrate knowledge of conductor and cable protection methods, procedures and their applications
- demonstrate knowledge of the procedures used to mechanically protect and support cables

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrate safe use of the tools and equipment used to string overhead conductors and cables*
 - *explain the procedure to attach pulling equipment to conductor or rope*
 - *explain information required to adjust tension on conductors and cable*
 - *demonstrate procedure to secure conductors and cable to dead-end fixtures depending on type and size of conductor*
 - *demonstrate how conductors and cables are transferred from travellers to insulators*
 - *explain how sleeves are selected and applied on ends of overhead conductors and cables*
 - *explain how connectors are selected and applied on ends of overhead conductors and cables*
-

Underground Distribution Systems

USYS 200

- demonstrate knowledge of underground systems, their characteristics and applications
- demonstrate knowledge of underground and underwater system construction principles
- demonstrate knowledge of the procedures used to install, splice and terminate underground and underwater conductors and cables
- demonstrate knowledge of the procedures used to install, connect, inspect maintain, troubleshoot, repair and test underground and underwater system components and accessories

Mentors can assist the apprentice to prepare for this section of technical training by:

- *explaining individual and multiple street light systems.*
- *providing hands on experience installing and maintaining street lights and street light systems.*

Street Lighting Systems

STRT 200

- demonstrate knowledge of street lighting systems, their characteristics and applications
- demonstrate knowledge of the procedures used to install, connect, troubleshoot, inspect, maintain, repair and test street lighting systems
- demonstrate knowledge of the procedures used to store and dispose of ballasts, capacitors and lamps

Mentors can assist the apprentice to prepare for this section of technical training by:

- *explaining individual and multiple street light systems.*
- *providing hands on experience installing and maintaining street lights and street light systems.*

Single-Phase Transformers and Switches

TRNS 200

- demonstrate knowledge of transformer operating principles
- demonstrate knowledge of transformer components, their applications and operation
- demonstrate knowledge of the procedures used to install and maintain transformers
- demonstrate knowledge of managing hazardous materials associated with transformers

Mentors can assist the apprentice to prepare for this section of technical training by:

- *explaining transformer principles and operations.*
- *familiarizing the apprentice with various transformer connection configurations.*
- *familiarizing the apprentice with various service voltages and load requirements.*

Protection Equipment

PROC 200

- demonstrate knowledge of fuses, their characteristics and applications
- demonstrate knowledge of operating principles of fuses
- demonstrate knowledge of procedures used to install fuses
- demonstrate knowledge of lightning arrestors, their characteristics and applications
- demonstrate knowledge of operating principles of lightning arrestors
- demonstrate knowledge of procedures used to install lightning arrestors

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrating safe use of the tools and equipment used to install fuses*
- *selecting tools and equipment used to install fuses according to job requirements*
- *explaining how to select the proper fuse according to company and engineering standards*
- *demonstrating the procedure to install a fuse into a holder and then placed into switch*
- *demonstrating procedure to safely energize fuses*
- *explaining common signs of defective fuses*
- *demonstrating safe use of the tools uses to install lightning arrestors*
- *explaining procedure to mount lightning arrestors according to company standards*
- *inspecting lightning arrestors for defects*

Single Phase Metering

METR 200

- demonstrate knowledge of single-phase metering equipment, their applications and use
- demonstrate knowledge of the procedures used to install single-phase metering equipment

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrating safe use of the tools and equipment used to install secondary metering equipment*
- *explaining the information used to select correct secondary metering equipment*
- *explaining procedures used to perform a meter base test*
- *recording meter readings*

Distribution Systems

OSYS 200

- demonstrate knowledge of primary and secondary distribution lines, their applications and operation
- demonstrate knowledge of primary and secondary distribution line components, their applications and operation
- demonstrate knowledge of the procedures used to install, inspect, maintain, repair, troubleshoot and test distribution lines
- demonstrate knowledge of overhead systems, their characteristics and applications
- demonstrate knowledge of overhead system construction principles
- demonstrate knowledge of the procedures used to install, connect, inspect, maintain, repair, troubleshoot and test overhead system components and accessories
- demonstrate knowledge of underground systems, their characteristics and applications
- demonstrate knowledge of underground system construction principles
- demonstrate knowledge of the procedures used to install, splice and terminate conductors and cables
- demonstrate knowledge of the procedures used to install, connect, inspect maintain, troubleshoot, repair and test underground system components and accessories

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrating the safe use of tools and equipment used to operate overhead, underground, and underwater distribution systems*
- *identifying proper circuits and equipment to prevent switching errors and to ensure work is being performed in the correct location*
- *testing, commissioning and energizing new distribution systems according to engineering standards and work procedures*
- *visually inspecting operation steps are done according to jurisdictional regulations and work procedures*
- *replacing distribution system components according to job requirement and company standards*
- *completing repairs or replacements of components and accessories*

Distribution and Transmission Maintenance

MAIN 200

- demonstrate knowledge of the procedures used to maintain pole structures for distribution and transmission systems
- demonstrate knowledge of tree trimming and felling, its procedure and use
- demonstrate knowledge of the tool and equipment used tree trimming and felling

Mentors can assist the apprentice to prepare for this section of technical training by:

- *removing pole structures and replacing them according to inspection documentation*
- *stubbing, topping, capping and treating pole structures*
- *straightening pole structures*
- *removing contaminants from contacts, disconnect switches and insulators to comply with design specifications*
- *demonstrate safe use of the tools and equipment used in the trimming and felling of trees*
- *explaining the procedures and techniques to safely trim and fell trees*
- *avoiding cross contamination by cleaning equipment and disposing of trimmings*

Transmission Systems

TSYS 200

- demonstrate knowledge of transmission systems, their applications and operation
- demonstrate knowledge of transmission system components, their applications and operation
- demonstrate knowledge of the procedures used to install, inspect, maintain, repair, troubleshoot and test transmission systems

Mentors can assist the apprentice to prepare for this section of technical training by:

- *selecting the proper tools and equipment to repair overhead transmission systems according to job specifications*
- *safely following work procedures according to company standards*
- *repairing conductors and cables by splicing*
- *testing cables and equipment with proper equipment to verify integrity or fault repair*

Electrical Theory

THRY 200

- demonstrate knowledge of AC circuits, their characteristics and operation
- demonstrate knowledge of the procedures used to troubleshoot AC circuits
- demonstrate knowledge of the procedures used to analyze and measure AC circuit values
- demonstrate knowledge of series, parallel and combination circuits, their characteristics and operation
- demonstrate knowledge of single-phase 3-wire circuits, their characteristics and operation
- demonstrate knowledge of inductance and capacitance, their characteristics and associated principles
- demonstrate knowledge of how inductance and capacitance are encountered on the job

Mentors can assist the apprentice to prepare for this section of technical training by:

- *performing calculations to analyze and measure electrical circuit values.*
- *describing basic electric circuit characteristics and different type of circuits.*
- *explaining principles of inductance and capacitance*



Level Three

12 days

112 hours

Three Phase Transformers

TRNS 300

- explain the connections and characteristics of wye, delta and combination connected systems
- draw and label a wye, delta and combination connected line and load using vectors
- calculate line and coil values for current and voltage in wye, delta and combination systems
- calculate the voltage, current or kVA in a balanced three-phase combination circuit
- calculate the three-phase power factor and phase angle in a balanced three-phase combination circuit
- explain service and system voltage configurations and their line/coil values
- describe the guidelines for connecting a closed transformer bank
- select and connect three transformers to provide single-phase and three-phase service voltage
- describe the guidelines for connecting an open transformer bank
- select and connect two transformers to build an open transformer bank
- describe the guidelines for paralleling three-phase banks
- determine both coil and line current and coil and line voltage values
- describe the procedure to determine the load in kVA on an alive substation or three-phase transformer bank
- explain the rated three-phase capacity of a substation or transformer bank
- explain the fuse and riser sizing for a transformer bank

Mentors can assist the apprentice to prepare for this section of technical training by:

- *reviewing AC and DC principles.*
- *explaining and demonstrating three phase connections and load checks.*
- *familiarizing the apprentice with various transformer bank connection configurations.*
- *familiarizing the apprentice with various service voltages and load requirements.*

Service Installation

SRVC 300

- explain the five types of service classifications
- explain the regulations of the Electric Service Guide regarding customer interface locations
- determine the appropriate conductor for a service installation
- explain the clearance regulations for services
- explain the procedure to install or change a three-phase service

Mentors can assist the apprentice to prepare for this section of technical training by:

- *ensuring the apprentice is exposed to metering components and installation, and instrument transformers.*
- *familiarizing the apprentice with meter installation and removal procedures.*
- *familiarizing the apprentice with hazards and PPE requirements for installing and removing meters and instrument transformers.*
- *familiarizing the apprentice with meter socket voltage and continuity check procedures.*

Instrument Transformers

INST 300

- explain the construction and function of potential and current transformers
- explain the construction and function of single-phase instrument meters
- connect all components in a single-phase instrument connected service
- determine the billing multiplier, consumption and cost for an instrument connected single-phase service

Mentors can assist the apprentice to prepare for this section of technical training by:

- *ensuring the apprentice is exposed to metering components and installation, and instrument transformers.*

- *familiarizing the apprentice with meter installation and removal procedures.*
- *familiarizing the apprentice with hazards and PPE requirements for installing and removing meters and instrument transformers.*
- *familiarizing the apprentice with meter socket voltage and continuity check procedures.*

Voltage Control Equipment

VCEM 300

- procedures used to install and operate voltage regulation and control devices
- potential overvoltage situations
- different types of overvoltage protection
- functions and applications of a shield wire
- function of lightning arrestors
- voltage regulation, its application and use
- devices and components used in voltage regulation, their application and use

Mentors can assist the apprentice to prepare for this section of technical training by:

- *familiarizing the apprentice with overcurrent and overvoltage protection devices and configurations, and oil circuit recloser.*
- *familiarizing the apprentice with fuse coordination principles.*
- *familiarizing the apprentice with line loss and loading issues that lead to a requirement for voltage regulation.*
- *familiarizing the apprentice with switching devices and Standard Protection Code requirements.*
- *familiarizing the apprentice with switching orders and procedures.*

Underground and Underwater Work

UWRK 300

- demonstrate knowledge of underground and underwater systems, their components, characteristics and applications
- demonstrate knowledge of underground and underwater system construction principles
- demonstrate knowledge of procedures used to install underground and underwater systems, and their components
- demonstrate knowledge of cable protection methods and their applications
- demonstrate knowledge of direct buried underground and underwater cable
- demonstrate knowledge of direct buried underground and underwater systems construction principles
- demonstrate knowledge of procedures used to install direct buried underground and underwater systems, and their components
- demonstrate knowledge of underground and underwater cable terminations
- demonstrate knowledge of procedures used to terminate and test underground and underwater cables
- explain the procedure to fuse and operate a three-phase underground transformer
- the procedure to fuse and operate a three-phase underground transformer
- explain the procedure used to install temporary grounds on single-phase underground apparatus
- explain the procedure used to install temporary grounds on a single- phase underground cable

Mentors can assist the apprentice to prepare for this section of technical training by:

- *explaining underground systems, tools and apparatus.*
- *familiarizing the apprentice with underground system maps, field identification and markings.*
- *identifying transformers, junction points, switching cubicles, construction standards, overhead/underground transition structures and their functions in the system.*
- *familiarizing the apprentice with Standard Protection Code requirements and procedures for working on underground systems.*

- *familiarizing the apprentice with safety regulations and requirements such as ground disturbance, locating, interpreting maps and field marking.*

Load Checks

LOAD 300

- demonstrate knowledge of distribution and transmission systems, their characteristics and applications
- demonstrate knowledge of procedures used to inspect, maintain and operate overhead, underground and underwater distribution and transmission systems
- demonstrate knowledge of pole structures, their characteristics and applications, and maintenance
- demonstrate knowledge of procedures used to inspect and maintain system components

Mentors can assist the apprentice to prepare for this section of technical training by:

- *removing contaminants from contacts, disconnect switches and insulators to comply with design specifications.*
- *assisting the apprentice in identifying circuits and equipment to prevent switching errors.*
- *demonstrate safe work practices pertaining to overhead, underground and underwater transmission systems.*
- *familiarizing the apprentice with specifications and regulations pertaining to distribution and transmission systems.*

Reclosers, Sectionalizers and Fuses

PROC 300

- demonstrate knowledge of procedures used to install different types of reclosers
- demonstrate knowledge of coordinated system protection
- demonstrate knowledge of operating principles of sectionalizers
- demonstrate knowledge of procedures used to install sectionalizers
- demonstrate knowledge of the operating principles of different types of reclosers, their application and use
- demonstrate knowledge of the function and installation of both fuses and thermal breakers
- demonstrate knowledge of procedures used to install reclosers

Mentors can assist the apprentice to prepare for this section of technical training by:

- *familiarizing the apprentice with overcurrent and overvoltage protection devices and configurations, and oil circuit recloser.*
- *familiarizing the apprentice with fuse coordination principles.*
- *familiarizing the apprentice with line loss and loading issues that lead to a requirement for voltage regulation.*
- *familiarizing the apprentice with switching devices and Standard Protection Code requirements.*
- *familiarizing the apprentice with switching orders and procedures.*

Transmission System Troubleshooting

TRBL 300

- demonstrate knowledge of overhead transmission systems, their characteristics and applications
- demonstrate knowledge of procedures to troubleshoot and test overhead transmission systems, and their components and accessories
- demonstrate knowledge of procedures used in temporary grounding and bonding of overhead transmission systems
- demonstrate knowledge of underground and underwater transmission systems, and their characteristics and applications

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrate safe usage of test equipment and tools used to troubleshoot transmission systems.*

- *demonstrate the procedure to isolate section of transmission line by operating equipment and devices according to switching authority.*
- *explain how switching procedures are documented and why.*
- *demonstrating troubleshooting techniques.*
- *demonstrate the removal of components to access lines.*
- *demonstrate the procedure to repair a line by splicing.*
- *demonstrate the procedure to return the line to service.*

Conductors and Cables (Distribution Stringing)

OHCC 300

- demonstrate knowledge of procedures used to string distribution lines
- demonstrate knowledge of distribution and transmission lines, their components, applications and operation
- demonstrate knowledge of splices and connections for overhead conductors and cables
- demonstrate knowledge of conductor and cable protection methods for splices and connections

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrate safe use of the tools and equipment used to string overhead conductors and cables*
- *explain the procedure to attach travellers on pole and steel lattice structures*
- *explain information required to adjust tension on conductors and cable*
- *demonstrate procedure to secure conductors and cable to dead-end fixtures depending on type and size of conductor*
- *demonstrate how conductors and cables are transferred from travellers to insulators*
- *explain how sleeves are selected and applied on ends of overhead conductors and cables*
- *explain how connectors are selected and applied on ends of overhead conductors and cables*

Hotstick work

HWRK 300

- demonstrate knowledge of principles of live-line work using FRP tools (hot sticks)
- demonstrate knowledge of principles of live-line work using rubber gloves
- demonstrate knowledge of the procedures to identify and maintain FRP tools (hot sticks) and their associated tools
- demonstrate knowledge of the procedures to identify the FRP tools (hot sticks) required to replace system components
- demonstrate knowledge of procedures to use cover-up
- demonstrate knowledge of the procedures used to calculate the weight and dead-end tension of a conductor

Mentors can assist the apprentice to prepare for this section of technical training by:

- *familiarizing the apprentice with inspection, care use, storage and testing of liveline tools.*
- *familiarizing the apprentice with load charts and capacities of various liveline tools and accessories.*
- *explaining liveline tool use and work procedures.*
- *familiarizing the apprentice with Limits of Approach, second point of contact, body positioning and other techniques.*
- *familiarizing the apprentice with conductor weights and forces.*

Switching Devices

SWTC 300

- demonstrate knowledge of the function, types and installation of cutouts
- demonstrate knowledge of the procedure used to operate a cutout
- demonstrate knowledge of the function and operation of primary single-phase and three-phase switching devices
- demonstrate knowledge of the function and operation of secondary switching devices

Mentors can assist the apprentice to prepare for this section of technical training by:

- *familiarizing the apprentice with overcurrent and overvoltage protection devices and configurations, and oil circuit recloser.*
- *familiarizing the apprentice with fuse coordination principles.*
- *familiarizing the apprentice with line loss and loading issues that lead to a requirement for voltage regulation.*
- *familiarizing the apprentice with switching devices and Standard Protection Code requirements.*
- *familiarizing the apprentice with switching orders and procedures.*



Level Four

10 days

75 hours

25kV Rubber Glove

RGBL 400

- demonstrate knowledge of the different classes of rubber gloves and how to select them according to voltage
- demonstrate knowledge of the procedures used to inspect and clean conductor supports and hotsticks
- demonstrate knowledge of the limits of approach on a 25kV system
- demonstrate knowledge of safe work procedures with regard to rubber glove use
- demonstrate knowledge of the conditions required for safe removal of rubber gloves

Mentors can assist the apprentice to prepare for this section of technical training by:

- *familiarizing the apprentice with inspection, care, use, storage and testing of rubber gloves.*
 - *familiarizing the apprentice with inspection, care, use, maintenance and testing of insulated aerial devices.*
 - *familiarizing the apprentice with positioning and set-up of insulated aerial devices.*
 - *familiarizing the apprentice with load charts and capacities of insulated aerial devices and components.*
 - *familiarizing the apprentice with conductor weights and forces.*
-

Mentoring

MENT 400

- demonstrate knowledge of strategies for teaching workplace skills

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrating effective communication techniques.*
 - *familiarizing the apprentice with constructive criticism.*
 - *demonstrating best practices and effective communication.*
-

Conductors and Cables (Transmission Stringing)

OHCC 400

- demonstrate knowledge of transmission lines, their applications and operation
- demonstrate knowledge of the procedures used to sag overhead conductors and cables
- demonstrate knowledge of distribution and transmission lines, their components, applications and operation

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrating procedures to install travellers and pulling rope.*
 - *familiarizing the apprentice with the set-up of stringing equipment.*
 - *familiarizing the apprentice with utility standards and regulations.*
 - *demonstrating effective conductor and cable protection methods.*
 - *demonstrating procedure to tension conductors.*
-

Capacitors, Regulators and Reactors

CRAR 400

- demonstrate knowledge of capacitors, their characteristics and applications
- demonstrate knowledge of the procedures used to install, operate, protect, inspect and test capacitors
- demonstrate knowledge of voltage regulation and control devices, their characteristics and applications
- demonstrate knowledge of the procedures used to install and operate voltage regulation and control devices
- demonstrate knowledge of reactors, their characteristics and applications

Mentors can assist the apprentice to prepare for this section of technical training by:

- *familiarizing the apprentice with overcurrent and overvoltage protection devices and configurations, and oil circuit recloser.*
- *familiarizing the apprentice with fuse coordination principles.*
- *familiarizing the apprentice with line loss and loading issues that lead to a requirement for voltage regulation.*
- *familiarizing the apprentice with switching devices and Standard Protection Code requirements.*
- *familiarizing the apprentice with switching orders and procedures.*

Introduction to Substations

SUBS 400

- demonstrate knowledge of hazards and describe safe work practices pertaining to substations
- demonstrate knowledge of components and accessories used in substations
- demonstrate knowledge of primary protective devices used in a substation
- demonstrate knowledge of substation, switching station and terminal components and describe their operation
- demonstrate knowledge of different types of substations, switching stations and terminals and describe their characteristics and applications
- demonstrate knowledge of the procedures used to inspect and maintain substations, and their components and accessories

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrate operation of system equipment according to work procedures.*
- *familiarize the apprentice with testing, commissioning and energization procedures.*
- *familiarize the apprentice with supply authority specifications and installation requirements.*
- *familiarize the apprentice with overhead components and accessories used in a substation.*

Line Patrol

PRTL 400

- demonstrate knowledge of the tools and equipment pertaining to the maintenance of system components and describe their applications and procedures for use
- demonstrate knowledge of procedures used to inspect and maintain system components
- demonstrate knowledge of electrical principles
- demonstrate knowledge of hazards and describe safe work practices pertaining to maintenance of system components during line patrol
- demonstrate knowledge of terminology and measurements associated with line patrol
- demonstrate knowledge of the procedures used to properly diagnose and remove a fault during line patrol
- demonstrate knowledge of common causes for faults and outages
- demonstrate knowledge of transformers and power transformers, their components, applications and operation
- identify types of system components and describe their characteristics, applications and accessories

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrate the use of common test equipment and techniques used to diagnose a fault.*
- *demonstrating the documentation of deficiencies and the method to repair.*
- *demonstrating the use of load checks to identify imbalanced or overloaded circuits.*
- *familiarizing the apprentice with safe work practices and identifying hazards.*
- *familiarizing apprentices with the types of distribution and transmission systems.*
- *familiarizing the apprentice with system components, installation and use.*

Transmission System Repair

TSYS 400

- demonstrate knowledge of procedures used to troubleshoot and test underground and underwater transmission systems, their components and accessories

- demonstrate knowledge of the procedures used to repair and test overhead transmission system components and accessories

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrating the use of testing equipment and techniques to troubleshoot a system.*
- *demonstrating the procedure to isolate a fault, damage or hazards.*
- *familiarizing the apprentice with the types of overhead transmission systems.*
- *demonstrating the procedure to temporarily bond/ground of overhead transmission systems.*
- *demonstrating the procedure to splice and repair damaged cables.*
- *demonstrating the procedure to complete a repair and re-energize.*

Cellular Towers

CELL 400

- demonstrate knowledge of cellular antenna operating principles

Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrate the use of tools and equipment related to cellular installation and repair.*
- *demonstrate the procedure to mount and secure an antenna according to manufacturer's specifications.*
- *demonstrate the installation of fibre and power cables to the structure according to company standards or manufacturer's specifications.*
- *familiarize the apprentice with the types of antennas and their applications.*
- *familiarize the apprentice with the hazards associated with an operating antenna.*

System Protection Apparatus

SYSP 400

- demonstrate knowledge of 25kV GOPT switches, their application and use
- demonstrate knowledge of the procedures used to operate a system with reclosers and an interlock
- demonstrate safe work practices pertaining to recloser use
- demonstrate knowledge of the different types of distribution reclosers, their applications and use
- demonstrate knowledge of the various controllers used with distribution reclosers
- demonstrate knowledge of recloser applications in relation to line protection coordination
- demonstrate knowledge of sectionalizer applications in relation to line protection coordination
- demonstrate knowledge of fuse application in relation to line protection coordination

Mentors can assist the apprentice to prepare for this section of technical training by:

- *explaining how protection systems operate.*
- *familiarizing the apprentice with safety rules Standard Protection Code and procedures for system/substation switching.*

Consider apprenticeship training as an investment in the future of your company and in the future of your workforce. Ultimately, skilled and certified workers increase your bottom line.

Get involved in the apprenticeship training system. Your commitment to training helps to maintain the integrity of the trade.

Do you have employees who have been working in the trade for a number of years but don't have trade certification? Contact your local apprenticeship office for details on how they might obtain the certification they need.

Saskatchewan Apprenticeship & Trade Certification Commission

2140 Hamilton St Regina SK S4P 2E3

Tel: (306) 787-2444

Fax: (306) 787-5105

Toll Free: 1-877-363-0536

Website: www.saskapprenticeship.ca

District Offices

Estevan (306) 637-4930

La Ronge (306) 425-4385

Moose Jaw (306) 694-3735

North Battleford (306) 446-7409

Prince Albert (306) 953-2632

Saskatoon (306) 933-8476

Swift Current (306) 778-8945

Yorkton (306) 786-1394