

# TRAINING REGULATIONS



## TRANSMISSION LINE INSTALLATION AND MAINTENANCE NC II

**UTILITIES SECTOR**

**TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY**  
East Service Road, South Superhighway, Taguig City, Metro Manila

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# TRAINING REGULATIONS FOR TRANSMISSION LINE INSTALLATION AND MAINTENANCE NC II

## Section 1 TRANSMISSION LINE INSTALLATION AND MAINTENANCE NC II QUALIFICATION

The **Transmission Line Installation and Maintenance NC II** Qualification consists of competencies that a person must possess to erect transmission line poles, perform overhead transmission line work, perform cold-, live- and ground-line maintenance works and install emergency restoration structure (ERS).

This Qualification is packaged from the proposed competency map of the Utilities Industry (Service Sector) shown in Annex A.

The units of competency comprising this qualification include the following:

<b>Code</b>	<b>BASIC COMPETENCIES</b>
500311105	Participate in workplace communication
500311106	Work in team environment
500311107	Practice career professionalism
500311108	Practice occupational health and safety procedures

  

<b>Code</b>	<b>COMMON COMPETENCIES</b>
UTL311203	Apply quality standards
UTL311206	Comply with environmental protection procedures
UTL311201	Observe procedures, specifications and manuals of instruction
UTL311205	Operate and maintain T/L tools and equipment

  

<b>Code</b>	<b>CORE COMPETENCIES</b>
UTL724601	Perform transmission line pole erection
UTL723213	Perform construction of overhead transmission line
UTL723214	Perform cold-line maintenance work
UTL723215	Perform live-line maintenance work
UTL723216	Perform ground line maintenance work
UTL724602	Install emergency restoration structure (ERS)

**A person who has achieved this Qualification is competent to be a:**

- Transmission lineman

## SECTION 2: COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common, and core units of competency required for **Transmission Line Installation and Maintenance NC II**.

### BASIC COMPETENCIES

**UNIT OF COMPETENCY :** PARTICIPATE IN WORKPLACE COMMUNICATION

**UNIT CODE :** 500311105

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized</i> terms are elaborated in the Range of Variables
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from <b>appropriate sources</b> 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate <b>medium</b> is used to transfer information and ideas 1.4 Appropriate non-verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and <b>storage</b> of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established <b>protocols</b> 2.4 <b>Workplace interactions</b> are conducted in a courteous manner 2.5 Questions about simple routine workplace procedures and matters concerning working conditions of employment are asked and responded to 2.6 Meetings outcomes are interpreted and implemented
3. Complete relevant work related documents	3.1 Range of <b>forms</b> relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Appropriate sources	1.1. Team members 1.2. Suppliers 1.3. Trade personnel 1.4. Local government 1.5. Industry bodies
2. Medium	2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information discussion 2.5. Follow-up or verbal instructions 2.6. Face to face communication
3. Storage	3.1. Manual filing system 3.2. Computer-based filing system
4. Forms	4.1. Personnel forms, telephone message forms, safety reports
5. Workplace interactions	5.1. Face to face 5.2. Telephone 5.3. Electronic and two way radio 5.4. Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
6. Protocols	6.1. Observing meeting 6.2. Compliance with meeting decisions 6.3. Obeying meeting instructions

## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1. Prepared written communication following standard format of the organization</li> <li>1.2. Accessed information using communication equipment</li> <li>1.3. Made use of relevant terms as an aid to transfer information effectively</li> <li>1.4. Conveyed information effectively adopting the formal or informal communication</li> </ul>
<p>2. Underpinning Knowledge</p>	<ul style="list-style-type: none"> <li>2.1. Effective communication</li> <li>2.2. Different modes of communication</li> <li>2.3. Written communication</li> <li>2.4. Organizational policies</li> <li>2.5. Communication procedures and systems</li> <li>2.6. Technology relevant to the enterprise and the individual's work responsibilities</li> </ul>
<p>3. Underpinning Skills</p>	<ul style="list-style-type: none"> <li>3.1. Follow simple spoken language</li> <li>3.2. Perform routine workplace duties following simple written notices</li> <li>3.3. Participate in workplace meetings and discussions</li> <li>3.4. Complete work related documents</li> <li>3.5. Estimate, calculate and record routine workplace measures</li> <li>3.6. Basic mathematical processes of addition, subtraction, division and multiplication</li> <li>3.7. Ability to relate to people of social range in the workplace</li> <li>3.8. Gather and provide information in response to workplace Requirements</li> </ul>
<p>4. Resource Implications</p>	<ul style="list-style-type: none"> <li>4.1. Fax machine</li> <li>4.2. Telephone</li> <li>4.3. Writing materials</li> <li>4.4. Internet</li> </ul>
<p>5. Methods of Assessment</p>	<ul style="list-style-type: none"> <li>5.1. Direct Observation</li> <li>5.2. Oral interview</li> <li>5.3. Written test</li> </ul>
<p>6. Context for Assessment</p>	<ul style="list-style-type: none"> <li>6.1. Competency may be assessed individually in the actual workplace or through accredited institution</li> </ul>

**UNIT OF COMPETENCY: WORK IN TEAM ENVIRONMENT**

**UNIT CODE : 500311106**

**UNIT DESCRIPTOR :** This unit covers the skills, knowledge and attitudes to identify the participant's roles and responsibilities as a member of a team.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Describe team role and scope	1.1. The <b>role and objective of the team</b> is identified from available <b>sources of information</b> 1.2. Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources
2. Identify own role and responsibility within team	2.1. Individual role and responsibilities within the team environment are identified 2.2. Roles and responsibility of other team members are identified and recognized 2.3. Reporting relationships within team and external to team are identified
3. Work as a team member	3.1. Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives 3.2. Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and <b>workplace context</b> 3.3. Observed protocols in reporting using standard operating procedures

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of the team	1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	2.1. Standard operating and/or other workplace procedures 2.2. Job procedures 2.3. Quality standards 2.4. OHS and environmental standards
3. Workplace context	3.1. Work procedures and practices 3.2. Conditions of work environments 3.3. Legislation and industrial agreements 3.4. Standard work practice including the storage, safe handling and disposal of chemicals 3.5. Safety, environmental, housekeeping and quality guidelines



## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> <li>1.1. Operated in a team to complete workplace activity</li> <li>1.2. Worked effectively with others</li> <li>1.3. Conveyed information in written or oral form</li> <li>1.4. Selected and used appropriate workplace language</li> <li>1.5. Followed designated work plan for the job</li> <li>1.6. Reported outcomes</li> </ol>
<p>2. Underpinning Knowledge and Attitude</p>	<ol style="list-style-type: none"> <li>2.1. Communication process</li> <li>2.2. Team structure</li> <li>2.3. Team roles</li> <li>2.4. Group planning and decision making</li> </ol>
<p>3. Underpinning Skills</p>	<ol style="list-style-type: none"> <li>3.1. Communicate appropriately, consistent with the culture of the workplace</li> </ol>
<p>4. Resource Implications</p>	<p>The following resources <b>MUST</b> be provided:</p> <ol style="list-style-type: none"> <li>4.1. Access to relevant workplace or appropriately simulated environment where assessment can take place</li> <li>4.2. Materials relevant to the proposed activity or tasks</li> </ol>
<p>5. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ol style="list-style-type: none"> <li>5.1. Observation of the individual member in relation to the work activities of the group</li> <li>5.2. Observation of simulation and/ or role play involving the participation of the individual member to the attainment of organizational goals</li> </ol>
<p>6. Context for Assessment</p>	<ol style="list-style-type: none"> <li>6.1. Competency may be assessed in the workplace or in a simulated workplace setting</li> <li>6.2. Assessment shall be observed while tasks are being undertaken whether individually or in a group</li> </ol>

**UNIT OF COMPETENCY: PRACTICE CAREER PROFESSIONALISM**

**UNIT CODE : 500311107**

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Integrate personal objectives with organizational goals	1.1. Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2. Intra- and interpersonal relationships are maintained in the course of managing oneself based on performance <b>evaluation</b> 1.3. Commitment to the organization and its goal is demonstrated in the performance of duties
2. Set and meet work priorities	2.1. Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2. <b>Resources</b> are utilized efficiently and effectively to manage work priorities and commitments 2.3. Practices along economic use and maintenance of equipment and facilities are followed as per established procedures
3. Maintain professional growth and development	3.1. <b>Trainings and career opportunities</b> are identified and availed of based on job requirements 3.2. <b>Recognitions</b> are -sought/received and demonstrated as proof of career advancement 3.3. <b>Licenses and/or certifications</b> relevant to job and career are obtained and renewed

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Evaluation	1.1 Performance Appraisal 1.2 Psychological Profile 1.3 Aptitude Tests
2. Resources	2.1 Human 2.2 Financial 2.3 Technology 2.3.1 Hardware 2.3.2 Software
3. Trainings and career opportunities	3.1 Participation in training programs 3.1.1 Technical 3.1.2 Supervisory 3.1.3 Managerial 3.1.4 Continuing Education 3.2 Serving as Resource Persons in conferences and workshops
4. Recognitions	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciations 4.4 Commendations 4.5 Awards 4.6 Tangible and Intangible Rewards
5. Licenses and/or certifications	5.1 National Certificates 5.2 Certificate of Competency 5.3 Support Level Licenses 5.4 Professional Licenses

## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Attained job targets within key result areas (KRAs)</li> <li>1.2 Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation</li> <li>1.3 Completed trainings and career opportunities which are based on the requirements of the industries</li> <li>1.4 Acquired and maintained licenses and/or certifications according to the requirement of the qualification</li> </ul>
<p>2. Underpinning Knowledge</p>	<ul style="list-style-type: none"> <li>2.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.)</li> <li>2.2 Company policies</li> <li>2.3 Company-operations, procedures and standards</li> <li>2.4 Fundamental rights at work including gender sensitivity</li> <li>2.5 Personal hygiene practices</li> </ul>
<p>3. Underpinning Skills</p>	<ul style="list-style-type: none"> <li>3.1 Appropriate practice of personal hygiene</li> <li>3.2 Intra and Interpersonal skills</li> <li>3.3 Communication skills</li> </ul>
<p>4. Resource Implications</p>	<p>The following resources <b>MUST</b> be provided:</p> <ul style="list-style-type: none"> <li>4.1 Workplace or assessment location</li> <li>4.2 Case studies/scenarios</li> </ul>
<p>5. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>5.1 Portfolio Assessment</li> <li>5.2 Interview</li> <li>5.3 Simulation/Role-plays</li> <li>5.4 Observation</li> <li>5.5 Third Party Reports</li> <li>5.6 Exams and Tests</li> </ul>
<p>6. Context for Assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency may be assessed in the work place or in a simulated work place setting</li> </ul>

**UNIT OF COMPETENCY :** PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES

**UNIT CODE :** 500311108

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes required to comply with regulatory and organizational requirements for occupational health and safety.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Identify hazards and risks	1.1 <b>Safety regulations</b> and workplace safety and hazard control practices and procedures are clarified and explained based on organizational procedures 1.2 <b>Hazards/risks</b> in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organizational procedures 1.3 <b>Contingency measures</b> during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures
2. Evaluate hazards and risks	2.1 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.2 Effects of the hazards are determined 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation
3. Control hazards and risks	3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies 3.3 <b>Personal protective equipment (PPE)</b> is correctly used in accordance with organization OHS procedures and practices 3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol
4. Maintain OHS awareness	4.1 <b>Emergency-related drills and trainings</b> are participated in as per established organization guidelines and procedures 4.2 <b>OHS personal records</b> are completed and updated in accordance with workplace requirements

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Safety regulations	May include but are not limited to: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations
2. Hazards/Risks	May include but are not limited to: 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics 2.4.1 Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles 2.4.2 Physiological factors – monotony, personal relationship, work out cycle
3. Contingency measures	May include but are not limited to: 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel
4. Personal Protective Equipment	May include but are not limited to: 4.1 body belt & strap 4.2 hard hat/ helmet 4.3 set gloves 4.4 goggles 4.5 safety shoes 4.6 tool pouch
5. Emergency-related drills and training	5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management
6. OHS personal records	6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed

## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Explained clearly established workplace safety and hazard control practices and procedures</li> <li>1.2 Identified hazards/risks in the workplace and its corresponding indicators in accordance with company procedures</li> <li>1.3 Recognized contingency measures during workplace accidents, fire and other emergencies</li> <li>1.4 Identified terms of maximum tolerable limits based on threshold limit value- TLV.</li> <li>1.5 Followed Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace</li> <li>1.6 Used Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices</li> <li>1.7 Completed and updated OHS personal records in accordance with workplace requirements</li> </ul>
<p>2. Underpinning Knowledge</p>	<ul style="list-style-type: none"> <li>2.1 OHS procedures and practices and regulations</li> <li>2.2 PPE types and uses</li> <li>2.3 Personal hygiene practices</li> <li>2.4 Hazards/risks identification and control</li> <li>2.5 Threshold Limit Value -TLV</li> <li>2.6 OHS indicators</li> <li>2.7 Organization safety and health protocol</li> <li>2.8 Safety consciousness</li> <li>2.9 Health consciousness</li> </ul>
<p>3. Underpinning Skills</p>	<ul style="list-style-type: none"> <li>3.1 Practice of personal hygiene</li> <li>3.1 Hazards/risks identification and control skills</li> <li>3.2 Interpersonal skills</li> <li>3.4 Communication skills</li> </ul>
<p>4. Resource Implications</p>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> <li>4.1 Workplace or assessment location</li> <li>4.2 OHS personal records</li> <li>4.3 PPE</li> <li>4.4 Health records</li> </ul>
<p>5. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>5.1 Portfolio Assessment</li> <li>5.2 Interview</li> <li>5.3 Case Study/Situation</li> </ul>
<p>6. Context for Assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency may be assessed in the work place or in a simulated work place setting</li> </ul>

## COMMON COMPETENCIES

**UNIT TITLE** : **APPLY QUALITY STANDARDS**

**UNIT CODE** : **ICT315202**

**UNIT DESCRIPTOR** : This unit covers the knowledge, skills and attitudes needed to apply quality standards in the workplace. The unit also includes the application of relevant safety procedures and regulations, organization procedures and customer requirements

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
	<i>Italicized Bold</i> terms are elaborated in the Range of Variables
1. Assess quality of received materials or components	1.1. Work instructions are obtained and work is carried out in accordance with standard operating procedures 1.2. Received <b>materials or component parts</b> are checked against workplace standards and specifications 1.3. Faulty material or components related to work are identified and isolated 1.4. <b>Faults</b> and any identified causes are recorded and/or reported to the supervisor concerned in accordance with workplace procedures 1.5. Faulty materials or components are replaced in accordance with workplace procedures
2. Assess own work	2.1. <b>Documentation</b> relative to quality within the company is identified and used 2.2. Completed work is checked against workplace standards relevant to the task undertaken 2.3. Faulty pieces are identified and isolated 2.4. Information on the quality and other indicators of production performance is recorded in accordance with workplace procedures 2.5. Deviations from specified <b>quality standards</b> , causes are documented and reported in accordance with the workplace standards operating procedures
3. Engage in quality improvement	3.1. Process improvement procedures are participated in relation to workplace assignment 3.2. Work is carried out in accordance with process improvement procedures 3.3. Performance of operation or quality of product or service to ensure <b>customer</b> satisfaction is monitored



## RANGE OF VARIABLES

VARIABLE	RANGE
1. Materials/components	1.1. Materials may include but not limited to: 1.1.1. Wires 1.1.2. Cables, soldering lead 1.1.3. Electrical tape 1.2. Components may include but not limited to: 1.2.1. ICs 1.2.2. Diodes
2. Faults	Faults may include but not limited to: 2.1. Components/materials not according to specification 2.2. Components/materials contain manufacturing defects 2.3. Components/materials do not conform with government regulation i.e., PEC, environmental code 2.4. Components/materials have safety defect
3. Documentation	3.1. Organization work procedures 3.2. Manufacturer's instruction manual 3.3. Customer requirements 3.4. Forms
4. Quality standards	4.1. Quality standards may relate but not limited to the following: 4.1.1. Materials 4.1.2. Component parts 4.1.3. Final product 4.1.4. Production processes
5. Customer	5.1. Co-worker 5.2. Suppliers 5.3. Client 5.4. Organization receiving the product or service

## EVIDENCE GUIDE

<p>1. Critical aspect of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1. Carried out work in accordance with the company's standard operating procedures</li> <li>1.2. Performed task according to specifications</li> <li>1.3. Reported defects detected in accordance with standard operating procedures</li> <li>1.4. Carried out work in accordance with the process improvement procedures</li> </ul>
<p>2. Underpinning knowledge</p>	<ul style="list-style-type: none"> <li>2.1. Relevant production processes, materials and products</li> <li>2.2. Characteristics of materials/component parts used in electronic production processes</li> <li>2.3. Quality checking procedures</li> <li>2.4. Workplace procedures</li> <li>2.5. Safety and environmental aspects of production processes</li> <li>2.6. Fault identification and reporting</li> <li>2.7. Quality improvement process</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1. Reading skills required to interpret work instruction</li> <li>3.2. Communication skills needed to interpret and apply defined work procedures</li> <li>3.3. Carry out work in accordance with OHS policies and procedures</li> </ul>
<p>4. Method of assessment</p>	<p>4.1. The assessor may select at least two (2) of the following assessment methods to objectively assess the candidate:</p> <ul style="list-style-type: none"> <li>4.1.1. Observation</li> <li>4.1.2. Questioning</li> <li>4.1.3. Practical demonstration</li> </ul>
<p>5. Resource implication</p>	<p>5.1. Materials and component parts and equipment to be used in a real or simulated electronic production situation</p>
<p>6. Context of Assessment</p>	<p>6.1. Assessment may be conducted in the workplace or in a simulated work environment.</p>

**UNIT TITLE** : **COMPLY WITH ENVIRONMENTAL PROTECTION PROCEDURES**

**UNIT CODE** : **UTL311206**

**UNIT DESCRIPTOR** : This unit covers the knowledge, skills and attitudes required to implement and monitor environmental protection policies and procedures including accessing relevant information concerning environmental protection regulations and procedures, and implementing and monitoring procedures concerning environmental hazards, related control procedures, environmental training arrangements, and required records and documentation.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Access information concerning environmental protection regulations and procedures	1.1 Relevant provisions of <b>environmental</b> legislation and codes of practice are accurately followed 1.2 Information on workplace environmental policies, procedures and programs is stored in a readily accessible location and manner 1.3 <b>Information</b> is accurately and clearly explained to the work team and updated according to change in workplace policy 1.4 Information about the outcomes of environmental risk identification and control procedures is provided to the <b>appropriate personnel</b>
2. Implement and monitor procedures concerning environmental hazards	2.1 Existing and potential <b>environmental hazards</b> in the workplace are identified and reported 2.2 Identified hazards are assessed in relation to relevant environmental protection policies 2.3 <b>Workplace procedures for dealing with hazardous events</b> are implemented wherever necessary to ensure that prompt control action is taken 2.4 <b>Personal protective equipment (PPE)</b> are obtained and used in accordance with job requirements 2.5 Hazardous events are investigated to identify causes, and control measures are implemented to prevent recurrence and minimize risks of such events
3. Implement and monitor environmental control procedures	3.1 Existing environmental protection measures are implemented, monitored and reviewed 3.2 Work procedures to protect environment are implemented and adherence to them by the work group is monitored 3.3 Required improvements to existing control measures are identified, including required resources for implementation, and reported to appropriate personnel

## RANGE OF VARIABLES

VARIABLE	RANGE
1 environment	Environment may include: <ul style="list-style-type: none"> <li>1.1 indoor</li> <li>1.2 outdoor</li> <li>1.3 marine</li> <li>1.4 atmospheric</li> </ul>
2 Information	Information/documents may include: <ul style="list-style-type: none"> <li>2.1 Workplace procedures and practices related to environmental protection, including all financial, operating and customer service policies and procedures</li> <li>2.2 OHS and environmental protection regulations</li> <li>2.3 Workplace housekeeping procedures and policies</li> <li>2.4 Code of practice for environmental protection</li> <li>2.5 Material safety data sheets</li> <li>2.6 Policies and procedures for entry and work in confined spaces</li> <li>2.7 Manufacturer's instructions concerning the use and servicing of equipment</li> <li>2.8 Emergency procedures</li> <li>2.9 Regulations and policies concerning noise, waste disposal/reprocessing, handling of dangerous goods/hazardous substances and other environmental protection issues</li> <li>2.10 Standards and certification requirements</li> <li>2.11 Quality assurance procedures</li> </ul>
3 Appropriate personnel	Appropriate personnel may include: <ul style="list-style-type: none"> <li>3.1 Workplace personnel including supervisors and management</li> <li>3.2 Site visitors</li> <li>3.3 Contractors</li> <li>3.4 Official representatives</li> </ul>
4 Environmental hazards	<ul style="list-style-type: none"> <li>4.1 Oils and lubricants</li> <li>4.2 Exhaust fumes</li> <li>4.3 Gas</li> <li>4.4 Smoke</li> <li>4.5 Chemicals and detergents</li> <li>4.6 Rubbish</li> <li>4.7 Noise</li> <li>4.8 wastes</li> </ul>

<p>5 Workplace procedures for dealing with hazardous events</p>	<p>Procedures may include:</p> <ul style="list-style-type: none"> <li>5.1 Inspection and housekeeping</li> <li>5.2 Maintenance including plant and equipment</li> <li>5.3 Purchasing</li> <li>5.4 Evacuation</li> <li>5.5 Hazardous substance containment</li> <li>5.6 Operational instruction</li> <li>5.7 Environmental information including incident and management practices</li> <li>5.8 Specific hazardous materials policies and procedures</li> <li>5.9 Risk assessment and control</li> <li>5.10 First aid</li> </ul>
<p>6 Personal protective equipment (PPE)</p>	<p>PPE may include:</p> <ul style="list-style-type: none"> <li>6.1 Gloves</li> <li>6.2 Safety headwear and footwear</li> <li>6.3 Safety glasses</li> <li>6.4 Two-way radios</li> <li>6.5 High visibility clothing</li> </ul>

## EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Identified and monitored environmental hazards in the workplace</li> <li>1.2 Implemented effective procedures for dealing with hazardous events</li> <li>1.3 Monitored workplace adherence to environmental practices</li> <li>1.4 Communicated effectively with the team members</li> </ul>
2. Underpinning knowledge and attitude	<ul style="list-style-type: none"> <li>2.1 Relevant environmental protection regulations &amp; codes of practice</li> <li>2.2 Workplace procedures and guidelines for implementing and monitoring environmental protection</li> <li>2.3 Environmental risks associated with workplace operations and related precautions to control the risk</li> <li>2.4 Environmental protection standards required in the workplace</li> <li>2.5 Workplace environmental hazards and related hazard control measures</li> <li>2.6 Equipment and resources required when implementing and monitoring environmental protection procedures</li> <li>2.7 Organizational structure and site layout</li> </ul>
3. Underpinning skills	<ul style="list-style-type: none"> <li>3.1 Workplace reporting and recording processes and procedures</li> <li>3.2 Communication skills</li> <li>3.3 Accessing information and data</li> <li>3.4 Problem solving skills</li> <li>3.5 Ability to: <ul style="list-style-type: none"> <li>3.5.1 recognize potential environmental risks and ways of minimizing them</li> <li>3.5.2 modify activities depending on differing workplace contexts, risk situations and environments</li> <li>3.5.3 counsel, advise and inform others on environmental protection matters</li> <li>3.5.4 identify and correctly use equipment and vehicles in accordance with environmental protection regulations and guidelines</li> </ul> </li> </ul>
4. Resource implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>4.1 Environmental protection regulations and guidelines</li> <li>4.2 OHS regulations and hazard prevention policies and procedures</li> <li>4.3 workplace environmental protection policies, procedures and instructions</li> <li>4.4 equipment/vehicle manufacturer's operating and servicing instructions</li> </ul>
5. Methods of assessment	<p>Competency should be assessed through:</p> <ul style="list-style-type: none"> <li>5.1 Direct observation</li> <li>5.2 Oral or written questioning</li> <li>5.3 Questions/interview</li> </ul> <p>Assessment of underpinning knowledge and practical skills may be combined</p>
6. Context of assessment	<ul style="list-style-type: none"> <li>6.1 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines</li> <li>6.2 Assessment may be conducted in the workplace or a simulated environment</li> </ul>

**UNIT OF COMPETENCY: OBSERVE PROCEDURES, SPECIFICATIONS AND MANUALS OF INSTRUCTIONS**

**UNIT CODE : UTL311201**

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes on identifying, interpreting, applying services to specifications and manuals and storing manuals.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Identify and access specification/manuals	1.1 Appropriate manuals are identified and accessed as per job requirements 1.2 Version and date of manual are checked to ensure that correct specification and procedures are identified
2. Interpret manuals	2.1 Relevant sections, chapters of specifications/ manuals are located in relation to the work to be conducted 2.2 Information and procedure in the manual are interpreted in accordance with industry practices
3. Apply information in manual	3.1 <b>Manual</b> is interpreted according to job requirements 3.2 Work steps are correctly identified in accordance with manufacturer's specification 3.3 Manual data are applied according to the given task 3.4 All correct sequencing and adjustments are interpreted in accordance with information contained on the manual or specifications
4. Store manuals	4.1 Manual or specification is stored appropriately to prevent damage, ready access and updating of information when required in accordance with company requirements

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Procedures, Specifications and Manuals of Instructions	Kinds of Manuals: 1.1 Manufacturer's Specification Manual 1.2 Repair Manual 1.3 Maintenance Procedure Manual 1.4 Periodic Maintenance Manual



## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Identified and accessed specification/manuals as per job requirements</li> <li>1.2 Interpreted manuals in accordance with industry practices</li> <li>1.3 Applied information in manuals according to the given task</li> <li>1.4 Stored manuals in accordance with company requirements</li> </ul>
<p>2. Underpinning knowledge and attitude</p>	<ul style="list-style-type: none"> <li>2.1 Types of manuals used in construction sector</li> <li>2.2 Identification of symbols used in the manuals</li> <li>2.3 Identification of units of measurements</li> <li>2.4 Unit conversion</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Reading and comprehension skills required to identify and interpret construction manuals and specifications</li> <li>3.2 Accessing information and data</li> </ul>
<p>4. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>4.1 All manuals/catalogues relative to construction sector</li> </ul>
<p>5. Methods of assessment</p>	<p>Competency should be assessed through:</p> <ul style="list-style-type: none"> <li>5.1 Direct observation</li> <li>5.2 Questions/interview</li> </ul> <p>Assessment of underpinning knowledge and practical skills may be combined</p>
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines</li> <li>6.2 Assessment may be conducted in the workplace or a simulated environment</li> </ul>

**UNIT OF COMPETENCY : OPERATE AND MAINTAIN T/L TOOLS AND EQUIPMENT**

**UNIT CODE : UTL311205**

**DESCRIPTOR :** This unit covers the knowledge, skills and attitude to operate and maintain transmission line tools and equipment. This unit will involve working in a team environment.

ELEMENT	PERFORMANCE CRITERIA <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Plan and prepare for work	1.1 Work instruction is secured and interpreted according to <b>job requirements</b> 1.2 Relevant <b>occupational health and safety requirements</b> are identified following job specifications 1.3 Relevant transmission line <b>tools, equipment and hardware</b> are identified and requested in accordance with job specifications
2. Prepare transmission line tools and equipment	2.1 Personal protective equipment (PPE) are obtained following job requirements 2.2 Transmission line tools, equipment and hardware are acquired and secured in line with job requirements 2.3 Transmission hot line tools are tested/set following manufacturer's standards or recommendation
3. Operate transmission line tools and equipment	3.1 PPE are used in line with job requirements 3.2 Transmission line tools and equipment are used in line with job requirements
4. Check condition of transmission line tools and equipment	4.1 Transmission line tools and equipment are identified according to classification and job requirements 4.2 Non-functional transmission line tools and equipment are segregated and labeled according to classification 4.3 Safety of transmission line tools and equipment are observed in accordance with manufacturer's instructions 4.4 Condition of PPE are checked in accordance with manufacturer's instructions
5. Perform basic preventive maintenance	5.1 Appropriate lubricants are identified according to types of equipment 5.2 Equipment are lubricated according to preventive maintenance schedule or manufacturer's specifications 5.3 Transmission line tools are cleaned and tested according to standard procedures 5.4 Transmission line tools and equipment are inspected, and repaired and replaced, if necessary, after use 5.5 Work place is cleaned and kept in safe state in line with OHS regulations
6. Store tools and equipment	6.1 Inventory of transmission line tools and equipment are conducted and recorded as per company practices 6.2 Transmission line tools and equipment are stored safely in appropriate locations in accordance with manufacturer's specifications or company procedures

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Job requirements	1.1 Perform overhead transmission line work 1.2 Erect pole 1.3 Perform live-line maintenance work 1.4 Perform cold-line maintenance work 1.5 Perform ground line maintenance work 1.6 Perform emergency restoration structure
2. Occupational health and safety requirements	May include but not limited to: 2.1 Personal protective equipment (PPE) <ul style="list-style-type: none"> <li>2.1.1 Safety hat</li> <li>2.1.2 Safety goggles</li> <li>2.1.3 Safety gloves</li> <li>2.1.4 Safety shoes</li> <li>2.1.5 Safety harness/strap</li> </ul> 2.2 Installation of grounding cluster
3. Transmission line tools, equipment and hardware	May include but not limited to: 3.1 Hand tools <ul style="list-style-type: none"> <li>3.1.1 Pliers</li> <li>3.1.2 Screwdrivers</li> <li>3.1.3 Adjustable wrenches</li> <li>3.1.4 Ball peen hammer</li> <li>3.1.5 Auger bit</li> <li>3.1.6 Hacksaw/cutting tools</li> <li>3.1.7 Steel tape</li> </ul> 3.2 Equipment <ul style="list-style-type: none"> <li>3.2.1 Motorized capstan</li> <li>3.2.2 Climbing gears</li> <li>3.2.3 Line truck/Boom truck</li> </ul> 3.3 Set of hot line trailer 3.4 Hardware <ul style="list-style-type: none"> <li>3.4.1 Insulator</li> <li>3.4.2 Machine bolts</li> <li>3.4.3 Suspension clamp assembly (ACSR/OHGW)</li> <li>3.4.4 Strain clamp assembly(ACSR/OHGW)</li> <li>3.4.5 Overhead ground wires</li> <li>3.4.6 Cross-arms and braces</li> <li>3.4.7 Conductors and accessories</li> </ul>

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Demonstrates ability to identify and comply with occupational health and safety standards in operating and maintaining transmission line tools and equipment</p> <p>1.2 Demonstrates ability to identify and safely use transmission tools and equipment</p> <p>1.3 Demonstrates ability to perform basic preventive maintenance servicing for transmission line equipment</p>
<p>2. Underpinning knowledge and attitude</p>	<p>2.1 Relevant occupational health and safety standards</p> <p>2.2 Proper procedure for the use of transmission line tools and equipment</p> <p>2.3 Basic preventive maintenance servicing for transmission line equipment</p>
<p>3. Underpinning skills</p>	<p>3.1 Following and complying occupational health and safety standards</p> <p>3.2 Following procedures for the safe use of transmission line tools and equipment</p> <p>3.3 Performing basic preventive maintenance servicing for transmission line equipment</p>
<p>4. Resource Implications</p>	<p>The following resources must be available:</p> <p>4.1 Transmission line tools, equipment and PPE</p> <p>4.2 Work area</p>
<p>5. Method of assessment</p>	<p>5.1 Observation and Oral questioning</p> <p>5.2 Demonstration with oral questioning</p> <p>5.3 Written test</p>
<p>6. Context of assessment</p>	<p>6.1 Competency may be assessed in the workplace or in a simulated workplace setting</p> <p>6.2 Assessment shall be undertaken either individually or part of team under limited supervision</p>

## CORE COMPETENCIES

**UNIT OF COMPETENCY : PERFORM T/L POLE ERECTION**

**UNIT CODE : UTL724601**

**DESCRIPTOR :** This unit covers the knowledge, skills and attitude required to erect pole. This involves working with a team. This unit includes competencies for installing new pole and/or replacement of old or damaged poles.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Plan and prepare for work	1.1 Work instruction is secured and interpreted according to <b>job requirements</b> 1.2 Relevant <b>occupational health and safety requirements</b> are identified following job specifications 1.3 Relevant transmission line <b>tools, equipment and hardware</b> are identified and requested in accordance with job specifications
2. Prepare hardware, transmission line tools and equipment	2.1 Personal protective equipment (PPE) are obtained following job requirements 2.2 Transmission line tools, equipment and hardware are acquired and secured in line with job requirements
3. Transport pole to job site	3.1 Transmission line tools, equipment and hardware are used in line with job requirements 3.2 Personal protective equipment (PPE) are used following job requirements 3.3 <b>Loading procedure</b> for poles is performed following <b>safety requirements</b> 3.4 Unloading procedure for poles is performed in line with safety requirements 3.5 Poles are hauled and dragged following <b>established procedures</b>
4. Perform pole-setting and excavation	4.1 Transmission line tools, equipment and hardware are used in line with job requirements 4.2 Personal protective equipment (PPE) are used following job requirements 4.3 <b>Pole setting procedure</b> is performed in line with job requirements 4.4 Pole grounding is installed, if necessary. 4.5 <b>Excavation procedure</b> is performed following established safety requirements
5. Erect and / or retire pole	5.1 Transmission line tools, equipment and hardware used in line with job requirements 5.2 Personal protective equipment (PPE) are used following job requirements 5.3 <b>Pole erection procedure</b> is performed in line with job requirements 5.4 Pole retiring procedure is performed in line with job requirement 5.4 Housekeeping procedure is performed following power industry procedure

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Pole erection job requirements	1.1 Methods of erection <ul style="list-style-type: none"> <li>1.1.1 Derrick truck</li> <li>1.1.2 Piking</li> <li>1.1.3 Gin pole</li> <li>1.1.4 Salagunting</li> </ul>
2. Occupational health and safety requirements	May include but not limited to: <ul style="list-style-type: none"> <li>2.1 Personal protective equipment (PPE)               <ul style="list-style-type: none"> <li>2.1.1 Safety hat</li> <li>2.1.2 Safety goggles</li> <li>2.1.3 Safety gloves</li> <li>2.1.4 Safety shoes</li> </ul> </li> <li>2.2 Safety harness/strap</li> </ul>
3. Transmission line tools, equipment and hardware	May include but not limited to: <ul style="list-style-type: none"> <li>3.1 Tools               <ul style="list-style-type: none"> <li>3.1.1 Rope</li> <li>3.1.2 Load tongue pole</li> <li>3.1.3 Sling</li> <li>3.1.4 Snatch blocks</li> <li>3.1.5 Auger bit</li> <li>3.1.6 Climbing gear</li> <li>3.1.7 Turning hook/cant hook</li> <li>3.1.8 Digging tools</li> <li>3.1.9 Adjustable wrench</li> <li>3.1.10 Ball peen hammer</li> </ul> </li> <li>3.2 Equipment               <ul style="list-style-type: none"> <li>3.2.1 Trailer</li> <li>3.2.2 Line truck</li> <li>3.2.3 Binder</li> <li>3.2.4 Winch</li> <li>3.2.5 Boom truck</li> <li>3.2.6 Crane</li> <li>3.2.7 Ratchet hoist</li> <li>3.2.8 Block and tackle</li> <li>3.2.9 Butting board</li> </ul> </li> <li>3.3 Hardware               <ul style="list-style-type: none"> <li>3.3.1 Machine bolts</li> <li>3.3.2 Grounding wire</li> <li>3.3.3 Staple wire</li> <li>3.3.4 Pole</li> </ul> </li> </ul>
4. Loading procedure	4.1 Mechanical (with boom truck) 4.2 Manual

5. Loading safety requirements	5.1 Weight of the pole is established 5.2 Poles securely fastened 5.3 Warning devices are installed
6. Hauling and dragging procedures	6.1 Manual 6.2 Mechanical (with winch)
7. Pole- setting procedure	7.1 Determine depth of excavation 7.2 Pole orientation 7.3 <u>Steel segments are joined together</u>
8. Excavation procedure	8.1 Determine stake 8.2 Outline hole 8.3 Dig hole following specified recommended depth 8.4 Cover hole 8.5 Cave in
9. Pole erection procedure	9.1 Derrick method 9.2 Gin pole method 9.3 Salagunting method 9.3.1 Knot tying / splicing 9.4 Pole alignment

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1. Demonstrates knowledge of different pole erection methods</li> <li>1.2. Demonstrates ability to identify and follow lineman's occupational health and safety standards</li> <li>1.3 Demonstrates ability to identify and use transmission line tools, equipment and hardware</li> <li>1.4 Demonstrates ability to perform pole hauling, pole setting and pole erection</li> <li>1.5 Demonstrates ability to communicate and work in a team environment</li> </ul>
<p>2. Underpinning knowledge and attitude</p>	<ul style="list-style-type: none"> <li>2.1 Uses and functions of rigging equipment (1)</li> <li>2.2 Lineman's occupational safety and health standards (3)</li> <li>2.2 Hand signal communication (4)</li> <li>2.4 Uses and specifications of transmission line tools, equipment and hardware (6)</li> <li>2.5 Safety procedures for pole hauling, pole setting and pole erection (5)</li> <li>2.6 Different pole erection methods (2)</li> <li>2.7 Power industry standards (7)</li> <li>2.8 Desirable work values and attitudes (cost conscious, safety conscious, quality conscious, etc.)</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Using rigging equipment</li> <li>3.2 Identifying and following lineman's occupational health and safety standards</li> <li>3.3 Using transmission line tools, equipment and hardware</li> <li>3.4 Following safety procedures for pole hauling, pole setting and pole erection</li> <li>3.5 Communication skills</li> <li>3.6 Working in a team environment</li> <li>3.7 Interpreting and following power industry standards</li> </ul>
<p>4. Resource implications</p>	<p>The following resources should be available:</p> <ul style="list-style-type: none"> <li>4.1 Tools, equipment, hardware and PPE (see range of variables)</li> <li>4.2 Load tongue pole</li> <li>4.3 Line truck</li> </ul>
<p>5. Method of assessment</p>	<ul style="list-style-type: none"> <li>5.1 Direct observation with oral questioning</li> <li>5.2 Demonstration of skills with oral questioning</li> <li>5.3 Written test</li> </ul>
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency maybe assessed in the workplace or in a simulated workplace setting</li> <li>6.2 Assessment shall be undertaken either individually or part of team under limited supervision</li> </ul>



**UNIT OF COMPETENCY : PERFORM CONSTRUCTION OF OVERHEAD TRANSMISSION LINE**

**UNIT CODE : UTL723213**

**DESCRIPTOR :** This unit covers the outcomes required for performing construction of overhead transmission line. This involves working with a team. The scope of this unit covers installation of new transmission line which is 69 KV and above.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Plan and prepare for work	1.1 Work instruction is secured and interpreted according to <b>job requirements</b> 1.2 Relevant <b>occupational health and safety requirements</b> are identified following job specifications 1.3 Relevant transmission line <b>tools, equipment and hardware</b> are identified and requested in accordance with job specifications
2. Prepare hardware, tools and equipment	2.1 Personal protective equipment (PPE) are obtained following job requirements 2.2 Transmission line tools, equipment and hardware are acquired and secured in line with job requirements
3. Perform overhead line construction work	5.3 Transmission line tools, equipment and hardware are used in line with job requirements 5.4 Personal protective equipment (PPE) are used following job requirements 5.5 Confirmation to proceed to work is secured from appropriate personnel in accordance with power industry procedure. 5.6 <b>Overhead line construction work procedures</b> is performed according to job specifications 5.7 Housekeeping procedure is performed in line with power industry procedure

## RANGE OF VARIABLES

VARIABLE	RANGE
<p>1. Overhead transmission line construction job requirements</p>	<p>1.1 Guys and anchors            1.2 Pole dressing                1.2.1 Cross-arm/hardware                1.2.2 Insulators/attachments            1.3 Conductor/overhead(OHGW) stringing                1.3.1 Conductor splicing                1.3.2 Armoring/Vibration damper</p>
<p>2. Occupational health and safety requirements</p>	<p>May include but not limited to:            2.1 Personal protective equipment (PPE)                2.1.1 Safety hat                2.1.2 Safety goggles                2.1.3 Safety gloves                2.1.4 Safety shoes                2.1.5 Safety harness/strap            2.2 Installation of grounding cluster</p>
<p>3. Transmission line tools, equipment and hardware</p>	<p>May include but not limited to:            3.1 Tools                3.1.1 Pliers                3.1.2 Screwdrivers                3.1.3 Adjustable wrenches                3.1.4 Ball peen hammer                3.1.5 Auger bit                3.1.6 Hacksaw/cutting tools            3.2 Equipment                3.2.1 Ratchet hoist                3.2.2 Capstan/Hand winch                3.2.3 Block and tackle                3.2.4 Compression tool                3.2.5 Snatch block                3.2.6 Climbing gears                3.2.7 Hydraulic cutter                3.2.8 Line truck/Boom truck            3.3 Hardware                3.3.1 Insulator                3.3.2 Machine bolts                3.3.3 Suspension clamps                3.3.4 Strain clamp                3.3.5 Overhead ground wires                3.3.6 Cross-arms and braces                3.3.7 Conductors and accessories                3.3.8 Tower parts                    3.3.1.1 Lattices                    3.3.2.1 Step bolts                    3.3.3.2 Bolts and nuts                    3.3.4.1 Plates and back plates                    3.3.5.1 Grounding cables</p>

4. Overhead line construction work procedure	Overhead line construction work may include procedures for: 4.1 Guys and anchors 4.2 Pole dressing 4.2.1 Cross-arm/hardware 4.2.2 Insulators/attachments 4.3 Conductor/overhead(OHGW) stringing 4.3.1 Conductor splicing 4.4 Armoring 4.5 Vibration damper 4.6 Structural grounding
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## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Demonstrates ability to interpret job requirements</li> <li>1.2 Demonstrates ability to identify and comply with lineman occupational health and safety requirements</li> <li>1.3 Demonstrates ability to identify and use transmission line tools, equipment and hardware</li> <li>1.4 Demonstrates ability to perform and follow overhead line work procedures</li> <li>1.5 Demonstrates ability to communicate and work with authorities and personnel concerned</li> </ul>
<p>2. Underpinning knowledge and attitude</p>	<ul style="list-style-type: none"> <li>2.1 Standards and specifications for construction of overhead transmission lines structures</li> <li>2.2 Occupational health and safety standards</li> <li>2.3 Uses and specifications of transmission line tools, equipment and hardware</li> <li>2.4 Uses and functions of rigging equipment</li> <li>2.5 Conductor riding technique</li> <li>2.6 Hand signal communication</li> <li>2.7 Structural drawings and symbols</li> <li>2.8 Electrical drawings and symbols</li> <li>2.9 Desirable work values and attitudes (cost conscious, safety conscious, quality conscious, etc.)</li> <li>2.10 Power industry standards</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Understanding standards and specifications for construction overhead transmission lines structures</li> <li>3.2 Complying lineman's occupational health and safety standards</li> <li>3.3 Identifying and understanding the uses and specifications of transmission line tools, equipment and hardware</li> <li>3.4 Using transmission line tools, equipment and hardware</li> <li>3.5 Using rigging equipment</li> <li>3.6 Performing conductor riding technique</li> <li>3.7 Using hand signal communication</li> <li>3.8 Working efficiently and systematically</li> <li>3.9 First aid skills</li> <li>3.9 Interpreting and following power industry standards</li> </ul>
<p>4. Resource implications</p>	<p>The following resources should be available:</p> <ul style="list-style-type: none"> <li>4.1 Tools, equipment, hardware and PPE (see range of variables)</li> <li>4.2 Work area</li> <li>4.3 Line truck</li> </ul>
<p>5. Method of assessment</p>	<ul style="list-style-type: none"> <li>5.1 Direct observation with oral questioning</li> <li>5.2 Demonstration with oral questioning</li> <li>5.3 Written test</li> </ul>
<p>6 Context of assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency maybe assessed in the workplace or in a simulated workplace setting</li> <li>6.2 Assessment shall be undertaken either individually or part of team under limited supervision</li> </ul>

**UNIT OF COMPETENCY : PERFORM COLD LINE MAINTENANCE WORK**

**UNIT CODE : UTL723214**

**DESCRIPTOR :** This unit covers the outcome required to perform cold line maintenance on any existing transmission line hardwares and materials.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Plan and prepare for work	1.1 Work instruction is secured and interpreted according to <b>job requirements</b> 1.2 Relevant <b>occupational health and safety requirements</b> are identified following job specifications 1.3 Relevant transmission line <b>tools, equipment and hardware</b> are identified and requested in accordance with job specifications
2. Prepare hardware, tools and equipment	2.1 Personal protective equipment (PPE) are obtained following job requirements 2.2 Transmission line tools, equipment and hardware are acquired and secured in line with job requirements
3. Perform cold-line maintenance procedure	3.1 Transmission line tools, equipment and hardware are used in line with job requirements 3.2 Personal protective equipment (PPE) are used following <b>job requirements</b> 3.3 Confirmation to proceed to work is secured from appropriate personnel in accordance with power industry procedure 3.4 <b>Cold-line maintenance work procedure</b> is performed following job requirements 3.5 Housekeeping procedure is performed in line with power industry procedure

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Cold line maintenance job requirements	May include but not limited to: 1.1 Replacement of rotten wood pole 1.2 Replacement of rotten cross arm 1.3 Replacement of broken/corroded insulator 1.4 Replacement of corroded line hardware 1.5 Replacement of rotten x-brace 1.6 Replacement of armor rod 1.7 Repair of damaged conductor
2. Occupational health and safety standards	May include but not limited to: 2.1 Personal protective equipment (PPE) 2.1.1 Safety hat 2.1.2 Safety goggles 2.1.3 Safety gloves 2.1.4 Safety shoes 2.1.5 Safety harness/strap 2.2 Installation of grounding cluster
3. Transmission line tools, equipment and hardware	May include but not limited to: 3.1 Tools 3.1.1 Pliers 3.1.2 Screwdrivers 3.1.3 Adjustable wrenches 3.1.4 Ball peen hammer 3.1.5 Auger bit 3.1.6 Hacksaw/cutting tools 3.1.7 Steel tape 3.2 Equipment 3.2.1 Ratchet hoist 3.2.2 Capstan/Hand winch 3.2.3 Block and tackle 3.2.4 Compression tool 3.2.5 Wire grip/cumalong 3.2.6 Snatch block 3.2.7 Climbing gears 3.2.8 Hydraulic cutter 3.2.9 Line truck/Boom truck 3.2.10 Wire rope/nylon 3.3 Hardware 3.3.1 Insulator 3.3.2 Machine bolts 3.3.3 Suspension clamp assembly (ACSR/OHGW) 3.3.4 Strain clamp assembly(ACSR/OHGW) 3.3.5 Overhead ground wires 3.3.6 Cross-arms and braces 3.3.7 Conductors and accessories 3.3.8 Poles (wood, steel or concrete)

	<p>3.3.8 Tower parts</p> <ul style="list-style-type: none"> <li>3.3.8.1 Lattices</li> <li>3.3.8.2 Step bolts</li> <li>3.3.8.3 Bolts and nuts</li> <li>3.3.8.4 Plates and back plates</li> <li>3.3.8.5 Grounding cables</li> </ul>
4. Cold-line maintenance procedure	<p>4.1 Safe procedure for:</p> <ul style="list-style-type: none"> <li>4.1.1 Replacing rotten wood pole</li> <li>4.1.2 Replacing rotten cross arm</li> <li>4.1.3 Replacing broken / corroded insulator</li> <li>4.1.4 Replacing corroded line hardware</li> <li>4.1.5 Replacing rotten x-brace</li> <li>4.1.6 Replacing armor rod</li> <li>4.1.7 Repairing damaged conductor</li> </ul>

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Demonstrates ability to interpret cold-line maintenance job requirements</li> <li>1.2 Demonstrates ability to identify and comply with lineman's occupational health and safety standards</li> <li>1.3 Demonstrates ability to identify and use transmission line tools, equipment and hardware</li> <li>1.4 Demonstrates ability to perform cold-line maintenance work or procedure</li> <li>1.6 Demonstrates ability to communicate and work in a team environment</li> </ul>
<p>2. Underpinning knowledge and attitude</p>	<ul style="list-style-type: none"> <li>2.1 Line hardware, materials and design structures &amp; specifications</li> <li>2.2 Lineman's occupational health and safety standards</li> <li>2.3 Uses and specifications of transmission line tools and equipment</li> <li>2.4 Uses and functions of rigging equipment</li> <li>2.5 Safety procedure to perform cold-line maintenance work</li> <li>2.6 Hand signal communication</li> <li>2.7 Desirable work values and attitudes (cost conscious, safety conscious, quality conscious, etc.)</li> <li>2.8 Power industry standards</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Identifying line hardware, materials and design structures and specifications</li> <li>3.2 Identifying and complying occupational health and safety standards</li> <li>3.3 Using transmission line tools, equipment and hardware</li> <li>3.4 Following safety procedures for cold-line maintenance work</li> <li>3.5 Work efficiently and systematically</li> <li>3.6 Communicating skills</li> <li>3.7 First aid skills</li> <li>3.8 Interpreting and following power industry standards</li> </ul>
<p>4. Resource implications</p>	<p>The following resources must be available:</p> <ul style="list-style-type: none"> <li>4.1 Transmission line tools, equipment and hardwares and PPE (see range of variables)</li> <li>4.2 Work area</li> <li>4.3 Climbing gears and safety belt</li> </ul>
<p>5. Method of assessment</p>	<ul style="list-style-type: none"> <li>5.1 Direct observation with questioning</li> <li>5.2 Demonstration with oral questioning</li> <li>5.3 Written test</li> </ul>
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency may be assessed in the workplace or in a simulated workplace setting</li> <li>6.2 Assessment shall be undertaken either individually or part of team under limited supervision</li> </ul>



**UNIT OF COMPETENCY : PERFORM LIVE-LINE MAINTENANCE WORK**

**UNIT CODE : UTL723215**

**DESCRIPTOR :** This unit covers the outcome required to perform live-line maintenance on any existing transmission line hardware and materials using both hot sticks method and bare hand method.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Plan and prepare for work	1.1 Work instruction is secured and interpreted according to <b>job requirements</b> 1.2 Relevant <b>occupational health and safety requirements</b> are identified following job specifications 1.3 Relevant transmission line <b>tools, equipment and hardware</b> are identified and requested in accordance with job specifications
2. Prepare hardware, transmission line tools and equipment	2.1 Personal protective equipment (PPE) are obtained following job requirements 2.2 Transmission line tools, equipment and hardware are acquired and secured in line with job requirements 2.3 Hotstick cleaning and testing procedures are performed based on manufacturer's standards
4. Perform live-line maintenance procedure	3.1 Transmission line tools, equipment and hardware are used in line with job requirements 3.2 Personal protective equipment (PPE) are used following job requirements 3.3 <b>Live-line maintenance work procedure</b> is performed following job requirements. 3.4 Housekeeping procedure is performed in line with power industry procedure

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Live-line maintenance job requirements	May include but not limited to: 1.1 Replacement of rotten wood pole 1.2 Replacement of rotten cross arm 1.3 Replacement of broken/corroded insulator 1.4 Replacement of corroded line hardwares 1.5 Replacement of rotten x-brace 1.6 Repair of armor rod 1.7 Repair of damaged conductor 1.8 Installation of vibration damper
2. Occupational health and safety standards	May include but not limited to: 2.1. Personal protective equipment (PPE) 2.1.1. Safety hat 2.1.2. Safety goggles 2.1.3. Safety gloves 2.1.4. Safety shoes (without steel toe) 2.1.5. Safety harness/strap 2.2 Ladder monitoring kit 2.3 Hot stick tester
3. Transmission line tools, equipment and hardware	May include but not limited to: 3.1 Hand tools 3.1.1 Pliers 3.1.2 Screwdrivers 3.1.3 Adjustable wrenches 3.1.4 Ball peen hammer 3.1.5 Auger bit 3.1.6 Hacksaw/cutting tools 3.1.7 Steel tape 3.2 Equipment 3.2.1 Motorized capstan 3.2.2 Climbing gears 3.2.3 Line truck/Boom truck 3.3 Set of hot line trailer 3.4 Hardware 3.4.1 Insulator 3.4.2 Machine bolts 3.4.3 Suspension clamp assembly (ACSR/OHGW) 3.4.4 Strain clamp assembly(ACSR/OHGW) 3.4.5 Overhead ground wires 3.4.6 Cross-arms and braces 3.4.7 Conductors and accessories
4. Live line maintenance work procedure	4.1 Hot stick method 4.2 Bare hand method

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Demonstrates ability to interpret live-line maintenance job requirements</li> <li>1.2 Demonstrates ability to identify and comply with lineman's occupational health and safety standards</li> <li>1.3 Demonstrates ability to identify and use transmission line tools, equipment, hardware and hot line trailer</li> <li>1.4 Demonstrates ability to perform live-line maintenance work or procedure</li> <li>1.5 Demonstrates ability to communicate and work in a team environment</li> </ul>
<p>2. Underpinning knowledge and attitude</p>	<ul style="list-style-type: none"> <li>2.1 Line hardware, materials and design structures &amp; Specifications</li> <li>2.2 Lineman's occupational health and safety standards</li> <li>2.3 Uses and specifications of transmission line tools, equipment and hot line trailer</li> <li>2.4 Safety procedure to perform live-line maintenance work</li> <li>2.5 Hand signal communication</li> <li>2.6 Desirable work values and attitudes (cost conscious, safety conscious, quality conscious, etc.)</li> <li>2.7 Power industry standards</li> <li>2.8 Uses and functions of rigging gears</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Identifying line hardware, materials and design structures and specifications</li> <li>3.2 Identifying and complying occupational health and safety standards</li> <li>3.3 Using transmission line tools, equipment, hardware and hot line trailer</li> <li>3.4 Following safety procedures for live-line maintenance work</li> <li>3.5 Work efficiently and systematically</li> <li>3.6 Communicating skills</li> <li>3.7 First aid skills</li> <li>3.8 Interpreting and following power industry standards</li> <li>3.9 Using rigging equipment</li> </ul>
<p>4. Resource Implications</p>	<p>The following resources must be available:</p> <ul style="list-style-type: none"> <li>4.1 Transmission line tools, equipment, hardwares and PPE and hot line trailer(see range of variables)</li> <li>4.2 Work area</li> <li>4.3 Climbing gears and safety belt</li> </ul>
<p>5. Method of assessment</p>	<ul style="list-style-type: none"> <li>5.1 Observation and Oral questioning</li> <li>5.2 Demonstration with oral questioning</li> <li>5.3 Written test</li> </ul>
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency may be assessed in the workplace or in a simulated workplace setting</li> <li>6.2 Assessment shall be undertaken either individually or part of team under limited supervision</li> </ul>

**UNIT OF COMPETENCY : PERFORM GROUND LINE MAINTENANCE WORK**

**UNIT CODE : UTL723216**

**DESCRIPTOR :** This unit covers the knowledge, skills and attitude required to perform ground line maintenance work. This unit also includes working in a team environment.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Plan and prepare for work	1.1 Work instruction is secured and interpreted according to <b>job requirements</b> 1.2 Relevant <b>occupational health and safety requirements</b> are identified following job specifications 1.3 Relevant transmission line <b>tools, equipment and hardware</b> are identified and requested in accordance with job specifications
3. Prepare hardware, tools and equipment	3.1 Personal protective equipment (PPE) are obtained following job requirements 3.2 Transmission line tools, equipment and hardware are acquired and secured in line with job requirements
5. Perform ground line maintenance procedure	3.1 Transmission line tools, equipment and hardware are used in line with job requirements 3.2 Personal protective equipment (PPE) are used following job requirements 3.3 <b>Ground line maintenance work procedure</b> is performed following job requirements. 3.4 Housekeeping procedure is performed in line with power industry procedure

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Ground line maintenance work job requirements	May include but not limited to: 1.1 Replacement of rusty and corroded guy wires 1.2 Replacement of pilfered guy wires and anchor rod and attachments 1.3 Replacement and repair of structural ground 1.4 Correction of pole alignment 1.5 Cutting of obstructive vegetations 1.6 Re-tensioning of loosed guy wires 1.7 Reinforced structure's stability of slope protection
2. Occupational health and safety standards	May include but not limited to: 2.2. Personal protective equipment (PPE) 2.2.1. Safety hat 2.2.2. Safety goggles 2.2.3. Safety gloves 2.2.4. Safety shoes (without steel toe)/rain boots
3. Transmission line tools, equipment and hardware	May include but not limited to: 3.1 Hand tools 3.1.1 Pliers 3.1.2 Screwdrivers 3.1.3 Adjustable wrenches 3.1.4 Ball peen hammer 3.1.5 Hacksaw/cutting tools 3.1.6 Bolo or power saw/axe 3.2 Equipment 3.2.1 Ratchet hoist 3.2.2 Cum-along or wire grip 3.2.2 Climbing gears/ladder 3.2.3 Rope 3.2.4 Line truck 3.3 Hardware 3.4.1 Guy wire 3.4.2 Anchor rod/anchor screw 3.4.3 Three bolts clamp/perform guy grip
4. Ground line maintenance work procedure	May include but not limited to: 4.1 Pruning/cutting 4.2 Re-tightening of guy wires 4.3 Replacement of pilfered hardware

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Demonstrates ability to interpret ground line maintenance job requirements</li> <li>1.2 Demonstrates ability to identify and comply with lineman's occupational health and safety standards</li> <li>1.3 Demonstrates ability to identify and use transmission line tools, equipment, hardware</li> <li>1.4 Demonstrates ability to perform ground line maintenance work or procedure</li> <li>1.3 Demonstrates ability to communicate and work in a team environment</li> </ul>
<p>2. Underpinning knowledge and attitude</p>	<ul style="list-style-type: none"> <li>2.1 Line hardware, materials and design structures &amp; specifications</li> <li>2.2 Illegal structures and vegetation within the right of way</li> <li>2.3 Lineman's occupational health and safety standards</li> <li>2.4 Uses and specifications of transmission line tools, and equipment</li> <li>2.5 Safety procedure to perform ground line maintenance work</li> <li>2.6 Hand signal communication</li> <li>2.7 Desirable work values and attitudes (cost conscious, safety conscious, quality conscious, etc.)</li> <li>2.8 Power industry standards</li> <li>2.9 Uses and functions of rigging gears</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Identifying line hardware, materials and design structures and specifications</li> <li>3.2 Identifying and complying occupational health and safety Standards</li> <li>3.3 Identifying illegal structures and vegetation within the right of way</li> <li>3.4 Using transmission line tools, equipment, and hardware</li> <li>3.5 Following safety procedures for ground line maintenance work</li> <li>3.6 Work efficiently and systematically</li> <li>3.2 Communicating skills</li> <li>3.3 First aid skills</li> <li>3.9 Interpreting and following power industry standards</li> <li>3.10 Using rigging equipment</li> </ul>
<p>4. Resource Implications</p>	<p>The following resources must be available:</p> <ul style="list-style-type: none"> <li>3.1 Transmission line tools, equipment, hardwares and PPE (see range of variables)</li> <li>3.2 Work area</li> <li>3.3 Line truck</li> </ul>
<p>5. Method of assessment</p>	<ul style="list-style-type: none"> <li>5.1 Observation and Oral questioning</li> <li>5.2 Demonstration with oral questioning</li> <li>5.3 Written test</li> </ul>
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency may be assessed in the workplace or in a simulated workplace setting</li> <li>6.2 Assessment shall be undertaken either individually or part of team under limited supervision</li> </ul>

**UNIT OF COMPETENCY : INSTALL EMERGENCY RESTORATION STRUCTURE (ERS)**

**UNIT CODE : UTL724602**

**DESCRIPTOR : This unit covers the knowledge, skills and attitude to install emergency restoration structure (ERS). This unit will involve working in a team environment.**

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>(Italicized Bold terms are elaborated in the range of variables)</i>
1. Plan and prepare for work	1.1 Work instruction is secured and interpreted according to <b><i>job requirements</i></b> 1.2 Relevant <b><i>occupational health and safety requirements</i></b> are identified following job specifications 1.3 Relevant transmission line <b><i>tools, equipment and hardware</i></b> are identified and requested in accordance with job specifications
2. Prepare hardware, tools and equipment	2.1 Personal protective equipment (PPE) are obtained following job requirements 2.2 Transmission line tools, equipment and hardware are acquired and secured in line with job requirements
3. Erect ERS	3.1 Transmission line tools, equipment and hardware are used in line with job requirements 3.2 Personal protective equipment (PPE) are used following job requirements 3.3 ERS erection procedure is performed in line with job requirements 3.4 Stringing procedure is performed in line with job requirements 3.5 Housekeeping procedure is performed following power industry procedure

## RANGE OF VARIABLES

VARIABLE	RANGE
1. ERS job requirements	May include but not limited to: 1.1 Topped tower structure 1.2 Leaning structure 1.3 Intermediary structure
2. Occupational health and safety requirements	May include but not limited to: 2.1 Personal protective equipment (PPE) 2.1.1 Safety hat 2.1.2 Safety goggles 2.1.3 Safety gloves 2.1.4 Safety shoes 2.1.5 Safety harness/strap 2.2 Installation of grounding cluster
3. Transmission line tools, equipment and hardware	May include but not limited to: 3.1 Tools 3.1.1 Rope 3.1.2 Sling 3.1.3 Snatch blocks 3.1.4 Adjustable wrench 3.1.5 Spud wrench 3.1.6 Socket wrench 3.1.7 Ball peen hammer 3.1.8 Safety belt 3.2 Equipment 3.2.1 Line truck 3.2.2 Binder 3.2.3 Hydraulic-powered unit (HPU) or capstan 3.2.4 Boom truck 3.2.5 Ratchet hoist 3.2.6 Block and tackle 3.3 Hardware 3.3.1 Anchor shackle 3.3.2 Bolts and nuts 3.3.3 Anchor rod/manta ray 3.3.4 Guy wires 3.3.5 Guy grips pre formed 3.3.6 Post insulator 3.3.7 Polymer 3.3.8 Set of ERS



## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Demonstrates ability to interpret ERS job requirements</li> <li>1.2 Demonstrates ability to comply with lineman's occupational health and safety standards</li> <li>1.3 Demonstrates ability to identify and use transmission line tools, equipment and hardware</li> <li>1.4 Demonstrates ability to perform ERS erection and stringing procedures</li> <li>1.5 Demonstrates ability to communicate and work in a team environment</li> </ul>
<p>2. Underpinning knowledge and attitude</p>	<ul style="list-style-type: none"> <li>2.1 Line hardware, materials and design structures &amp; specifications</li> <li>2.2 Lineman's occupational health and safety standards</li> <li>2.3 Uses and specifications of transmission line tools and equipment</li> <li>2.4 Safety procedure to perform ERS erection and stringing procedures</li> <li>2.5 Hand signal communication</li> <li>2.6 Desirable work values and attitudes (cost conscious, safety conscious, quality conscious, etc.)</li> <li>2.7 Power industry standards</li> <li>2.8 Uses and functions of rigging gears</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Identifying line hardware, materials and design structures and specifications</li> <li>3.2 Identifying and complying occupational health and safety standards</li> <li>3.3 Using transmission line tools, equipment and hardware</li> <li>3.4 Following safety procedures for performing ERS erection and stringing</li> <li>3.5 Working efficiently and systematically</li> <li>3.6 Communicating skills</li> <li>3.7 First aid skills</li> <li>3.8 Interpreting and following power industry standards</li> <li>3.9 Using rigging equipment</li> </ul>
<p>4. Resource Implications</p>	<p>The following resources must be available:</p> <ul style="list-style-type: none"> <li>4.1 Transmission line tools, equipment and hardwares and PPE (see range of variables)</li> <li>4.2 Work area</li> </ul>
<p>5. Method of assessment</p>	<ul style="list-style-type: none"> <li>5.1 Observation and Oral questioning</li> <li>5.2 Demonstration with oral questioning</li> <li>5.3 Written test</li> </ul>
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency may be assessed in the workplace or in a simulated workplace setting</li> <li>6.2 Assessment shall be undertaken either individually or part of team under limited supervision</li> </ul>

## SECTION 3 TRAINING STANDARDS

### 3.1 CURRICULUM DESIGN

**Course Title: TRANSMISSION LINE INSTALLATION AND MAINTENANCE NC II**

**Nominal Training Duration:**        **18** hrs – Basic Competencies  
   **48** hrs – Common Competencies  
   **580** hrs – Core Competencies

**Course Description:**

This course is designed to develop & enhance the knowledge, skills, & attitudes of a transmission line lineman, in accordance with industry standards. It covers the basic and common competencies in addition to the core competencies such as erecting pole, performing overhead transmission line work, performing cold-, live- and ground maintenance works as well as installing emergency restoration structure (ERS).

**BASIC COMPETENCIES**  
**18 hrs**

<b>Unit of Competency</b>	<b>Learning Outcome</b>	<b>Methodology</b>	<b>Assessment Approach</b>
1. Participate in Workplace Communication	1.1 Obtain and convey workplace information 1.2 Participate in workplace meetings and discussions 1.3 Complete relevant work related documents	<ul style="list-style-type: none"> <li>• Group discussion</li> <li>• Interaction</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Observation</li> <li>• Interviews/questioning</li> </ul>
2. Work in a Team Environment	2.1 Describe and identify team role and responsibility in a team 2.2 Describe work as a team member	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Interaction</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Observation</li> <li>• Interviews/questioning</li> </ul>
3. Practice Career Professionalism	3.1 Integrate personal objectives with organizational goals 3.2 Set and meet work priorities 3.3 Maintain professional growth and development	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Interaction</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Observation</li> <li>• Interviews/questioning</li> </ul>
4. Practice Occupational Health and Safety Procedures	4.1 Identify hazards and risks 4.2 Evaluate hazards and risks 4.3 Control hazards and risks 4.4 Maintain occupational health and safety awareness	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Plant tour</li> <li>• Symposium</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Interview</li> </ul>

## COMMON COMPETENCIES

48 hrs

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Apply Quality Standards	1.1 Check materials and replace faulty ones in accordance with workplace standards and requirements 1.2 Carry out work assignments in accordance with standard operating procedures 1.3 Check completed work against standards and specifications 1.4 Document and prepare a report on deviations from specific quality standards	<ul style="list-style-type: none"> <li>▪ Lecture</li> <li>▪ Discussion</li> <li>▪ Demonstration</li> <li>▪ Viewing multimedia</li> <li>▪ Hands on practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observation in workplace</li> <li>▪ Demonstration</li> <li>▪ Oral questioning</li> <li>▪ Third Party Report</li> </ul>
2. Comply with environmental protection procedures	2.1 Access information concerning environmental protection regulations and procedures 2.2 Implement and monitor procedures concerning environmental hazards 2.3 Implement and monitor environmental control procedures	<ul style="list-style-type: none"> <li>▪ Lecture</li> <li>▪ Discussion</li> <li>▪ Demonstration</li> <li>▪ Viewing multimedia</li> <li>▪ Hands on practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observation in workplace</li> <li>▪ Demonstration</li> <li>▪ Oral questioning</li> <li>▪ Third Party Report</li> </ul>
3. Observe procedures, Specifications and Manuals of Instructions	3.1 Identify and access specification/ manuals 3.2 Interpret and apply information in manuals	<ul style="list-style-type: none"> <li>▪ Lecture</li> <li>▪ Discussion</li> <li>▪ Demonstration</li> <li>▪ Viewing multimedia</li> <li>▪ Hands on practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observation in workplace</li> <li>▪ Demonstration</li> <li>▪ Oral questioning</li> <li>▪ Third Party Report</li> </ul>
4. Maintain and operate transmission line tools and equipment	4.1 Plan and prepare for work to operate and maintain T/L tools and equipment 4.2 Prepare T/L hardware, tools and equipment for operation and maintenance 4.3 Operate T/L tools and equipment 4.4 Check condition of T/L tools and equipment 4.5 Perform basic preventive maintenance 4.6 Store tools and equipment	<ul style="list-style-type: none"> <li>▪ Lecture</li> <li>▪ Discussion</li> <li>▪ Demonstration</li> <li>▪ Viewing multimedia</li> <li>▪ Hands on practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observation in workplace</li> <li>▪ Demonstration</li> <li>▪ Oral questioning</li> <li>▪ Third Party Report</li> </ul>

## CORE COMPETENCIES

580 hrs

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Perform T/L pole erection	1.1 Plan and prepare for pole erection work 1.2 Prepare T/L hardware, tools and equipment for pole erection 1.3 Transport pole to job site 1.4 Perform pole-siting and excavation 1.5 Erect and/or retire pole	<ul style="list-style-type: none"> <li>▪ Lecture</li> <li>▪ Discussion</li> <li>▪ Demonstration</li> <li>▪ Viewing multimedia</li> <li>▪ Hands on practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observation in workplace</li> <li>▪ Demonstration</li> <li>▪ Oral questioning</li> <li>▪ Third Party Report</li> </ul>
2. Perform overhead transmission line work	2.1 Plan and prepare for overhead T/L work. 2.2 Prepare T/L hardware, tools and equipment for overhead T/L maintenance 2.3 Perform overhead line work	<ul style="list-style-type: none"> <li>▪ Lecture</li> <li>▪ Discussion</li> <li>▪ Demonstration</li> <li>▪ Viewing multimedia</li> <li>▪ Hands on practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observation in workplace</li> <li>▪ Demonstration</li> <li>▪ Oral questioning</li> <li>▪ Third Party Report</li> </ul>
3. Perform cold-line maintenance work	3.1 Plan and prepare for cold-line maintenance work 3.2 Prepare T/L hardware, tools and equipment for cold-line maintenance 3.3 Perform cold-line maintenance procedure	<ul style="list-style-type: none"> <li>▪ Lecture</li> <li>▪ Discussion</li> <li>▪ Demonstration</li> <li>▪ Viewing multimedia</li> <li>▪ Hands on practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observation in workplace</li> <li>▪ Demonstration</li> <li>▪ Oral questioning</li> <li>▪ Third Party Report</li> </ul>
4. Perform ground line maintenance work	4.1 Plan and prepare for ground line maintenance work 4.2 Prepare T/L hardware, tools and equipment for ground line maintenance 4.3 Perform ground-line maintenance procedure	<ul style="list-style-type: none"> <li>▪ Lecture</li> <li>▪ Discussion</li> <li>▪ Demonstration</li> <li>▪ Viewing multimedia</li> <li>▪ Hands on practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observation in workplace</li> <li>▪ Demonstration</li> <li>▪ Oral questioning</li> <li>▪ Third Party Report</li> </ul>
5. Perform live-line maintenance work	5.1 Plan and prepare for live-line maintenance work 5.2 Prepare T/L hardware, tools and equipment for live-line maintenance 5.3 Perform live-line maintenance procedure	<ul style="list-style-type: none"> <li>▪ Lecture</li> <li>▪ Discussion</li> <li>▪ Demonstration</li> <li>▪ Viewing multimedia</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observation in workplace</li> <li>▪ Demonstration</li> <li>▪ Oral questioning</li> <li>▪ Third Party Report</li> </ul>
6. Install emergency restoration structure	6.1. Plan and prepare for ERS installation 6.2. Prepare T/L hardware, tools and equipment for ERS installation 6.3. Erect emergency restoration structure (ERS)	<ul style="list-style-type: none"> <li>▪ Lecture</li> <li>▪ Discussion</li> <li>▪ Demonstration</li> <li>▪ Viewing multimedia</li> <li>▪ Hands on practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Observation in workplace</li> <li>▪ Demonstration</li> <li>▪ Oral questioning</li> <li>▪ Third Party Report</li> </ul>

## 3.2 TRAINING DELIVERY

The delivery of training should adhere to the design of the curriculum. Delivery should be guided by the 10 basic principles of the competency-based Technical and Vocational Education and Training (TVET).

- The training is based on curriculum developed from the competency standards;
- Learning is modular in its structure;
- Training delivery is individualized and self-paced;
- Training is based on work that must be performed;
- Training materials are directly related to the competency standards and the curriculum modules;
- Assessment is based in the collection of evidence of the performance of work to the industry required standard;
- Training is based both on and off-the-job components;
- Allows for recognition of prior learning (RPL) or current competencies;
- Training allows for multiple entry and exit; and
- Approved training programs are nationally accredited.

The competency-based TVET system recognizes various types of delivery modes, both on and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities may be adopted when designing training programs:

- The dualized mode of training delivery is preferred and recommended. Thus programs would contain both in-school and in-industry training or fieldwork components. Details can be referred to the Dual Training System (DTS) Implementing Rules and Regulations.
- Modular/self-paced learning is a competency-based training modality wherein the trainee is allowed to progress at his own pace. The trainer only facilitates the training delivery.
- Peer teaching/mentoring is a training modality wherein fast learners are given the opportunity to assist the slow learners.
- Supervised industry training or on-the-job training is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire a specific competencies prescribed in the training regulations.
- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructors are not in the same place. Distance learning may employ correspondence study, or audio, video or computer technologies.

### 3.3 TRAINEE ENTRY REQUIREMENTS

The trainees who wish to enter the course should possess the following requirements:

- At least high school graduate or equivalent
- Can communicate in oral and written language
- Must be physically and mentally fit to undergo training e.g. ***no fear of working in height***

This list does not include **specific institutional requirements**, such as height and age requirements, educational attainment, appropriate work experience and others that may be required from the trainees by the school or training center delivering the TVET program.

\*

### 3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS (Institution-based)

Recommended list of tools, equipment and materials required for a class size of **20 trainees** for Transmission Line Installation and Maintenance NC II:

TOOLS		EQUIPMENT		HARDWARE/ ACCESSORIES	
QTY	ITEM	QTY	ITEM	QTY	ITEM
20 pcs.	Pliers	6 sets	Ratchet hoist	190 pcs.	T/L Insulator
20 pcs.	Ballpeen hammers	2 sets	Capstan/Hand winch (includes tightener)	1 lot	Machine bolts
20 pcs.	Screwdrivers	6 sets	Block and tackle	12 sets	Suspension clamps
4 sets	Hacksaw	2 sets	Compression tool	30 sets	Strain clamp
20 pcs.	Adjustable wrenches	6 sets	Snatch block	1 lot	Overhead ground wires
4 pcs.	Auger bit	20 sets	Climbing gears set	12 pcs.	Cross-arms and braces (of various lengths)
4 sets	Cutting tools (hydraulic, acetylene, bolo)	1 set	Dynamometer/ Tension meter	1 lot	Conductors and accessories
1 unit	Hotline trailer	6 sets	Wire grip/cum-along	1 lot	Tower parts
4 sets	Digging tools (straight shovel, spoon, digging bar, hole digger, garden shovel)	2 sets	Hydraulic cutter	2 sets	Emergency Restoration Structure (ERS)
20 pcs.	Steel tape	1 unit	Leakage-current monitoring kit (hot stick tester/la	16 pcs.	Poles (assorted)

2 pcs	Tele-height meter	1 unit	Line truck		
		1unit	Boom truck		
		2 sets	ERS gin pole (with complete accessories)		
		5 rolls	Nylon rope		
		21 pcs.	Stringing roller		
		25 pcs.	Webbing sling/nylon		
		1 unit	Splicing machine		
			<b>PPE</b>		
		20 pcs.	Hard hat		
		20 pairs	Safety shoes		
		20 pcs.	Safety goggles		
		2 sets	Conductive suit		
		20 pcs.	Safety gloves		
		2 sets	First-aid kit set		

### 3.5 TRAINING FACILITIES

Recommended space requirements for the various teaching/learning areas are as follows:

TEACHING/LEARNING AREAS	SIZE IN METERS (M)	AREA IN SQ. M	QTY	TOTAL AREA IN SQ. M
Lecture Area	6 x 8	48	1	48
Laboratory Area (field-based)	7 X 8	56	1	56
Learning Resource Area	4 x 5	20	1	20
Wash ,Toilet & Locker Room	3 x 5	15	1	15
<b>Total</b>				139
Facilities / Equipment / Circulation*				35
<b>Total Area</b>				<b>174</b>

### 3.6 TRAINERS QUALIFICATIONS

#### TRANSMISSION LINE INSTALLATION AND MAINTENANCE NC II Trainer's Qualification TQ II

- Must be a holder of Transmission Line Installation and Maintenance NCII or equivalent
- Must have completed Training Methodology II (TM II) course or equivalent
- Must have at least 5-years relevant industry experience.
- Must be physically & mentally fit.

\* Optional: Only when required by the hiring institution.

### 3.7 INSTITUTIONAL ASSESSMENT

Institutional assessment is undertaken by trainees to determine their achievement of units of competency. A certificate of achievement is issued for each unit of competency.



## SECTION 4: NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

- 4.1 To attain the National Qualification of Transmission Line Installation and Maintenance NC II, the candidate must demonstrate competency in all the units listed in Section 1. Successful candidates shall be awarded a **National Certificate II** signed by the TESDA Director General.
- 4.2 The qualification of Transmission Line Installation and Maintenance NC II can be attained through:
- 4.2.1. Accumulation of Certificates of Competency (COCs) in all the following units of competency:
- 4.2.1.1. Perform pole erection
  - 4.2.1.2. Perform overhead transmission line work
  - 4.2.1.3. Perform cold line maintenance work
  - 4.2.1.4. Perform ground line maintenance work
  - 4.2.1.5. Performing live-line maintenance work
  - 4.2.1.6. Installing emergency restoration structure (ERS)
- 4.2.2. Demonstration of competence through project-type assessment covering clustered units of competency of the qualification:
- 4.2.2.1. Perform erection of pole, dressing and installation of guy wires
    - Perform pole erection
    - Perform overhead transmission line work
    - Perform cold line maintenance work
    - Perform ground line maintenance work
  - 4.2.2.2. Performing live-line maintenance work
  - 4.2.2.3. Installing emergency restoration structure (ERS)
- 4.3 Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.
- 4.4 The following are qualified to apply for assessment and certification:
- 4.4.1. Graduate of formal, non-formal, and informal including enterprise-based training programs.
- 4.4.2. Experienced workers (wage employed or self employed)
- 4.5 The guidelines on assessment and certification are discussed in detail in the “Procedures Manual on Assessment and Certification” and “Guidelines on the Implementation of the Philippine TVET Qualification and Certification System (PTQCS)”.

## DEFINITION OF TERMS

### GENERAL

- 1) **Certification** - is the process of verifying and validating the competencies of a person through assessment
- 2) **Certificate of Competency (COC)** – is a certification issued to individuals who pass the assessment for a single unit or cluster of units of competency
- 3) **Common Competencies** - are the skills and knowledge needed by all people working in a particular industry
- 4) **Competency** - is the possession and application of knowledge, skills and attitudes to perform work activities to the standard expected in the workplace
- 5) **Competency Assessment** - is the process of collecting evidence and making judgments on whether competency has been achieved
- 6) **Competency Standard (CS)** - is the industry-determined specification of competencies required for effective work performance
- 7) **Context of Assessment** - refers to the place where assessment is to be conducted or carried out
- 8) **Core Competencies** - are the specific skills and knowledge needed in a particular area of work - industry sector/occupation/job role
- 9) **Critical aspects of competency** - refers to the evidence that is essential for successful performance of the unit of competency
- 10) **Elective Competencies** - are the additional skills and knowledge required by the individual or enterprise for work
- 11) **Elements** - are the building blocks of a unit of competency. They describe in outcome terms the functions that a person performs in the workplace.
- 12) **Evidence Guide** - is a component of the unit of competency that defines or identifies the evidences required to determine the competence of the individual. It provides information on critical aspects of competency, underpinning knowledge, underpinning skills, resource implications, assessment method and context of assessment
- 13) **Level** - refers to the category of skills and knowledge required to do a job
- 14) **Method of Assessment** - refers to the ways of collecting evidence and when, evidence should be collected

- 15) **National Certificate (NC)** – is a certification issued to individuals who achieve all the required units of competency for a national qualification defined under the Training Regulations. NCs are aligned to specific levels within the PTQF
- 16) **Performance Criteria** - are evaluative statements that specify what is to be assessed and the required level of performance
- 17) **Qualification** - is a cluster of units of competencies that meets job roles and is significant in the workplace. It is also a certification awarded to a person on successful completion of a course in recognition of having demonstrated competencies in an industry sector
- 18) **Range of Variables** - describes the circumstances or context in which the work is to be performed
- 19) **Recognition of Prior Learning (RPL)** – is the acknowledgement of an individual's skills, knowledge and attitudes gained from life and work experiences outside registered training programs
- 20) **Resource Implications** - refers to the resources needed for the successful performance of the work activity described in the unit of competency. It includes work environment and conditions, materials, tools and equipment
- 21) **Basic Competencies** - are the skills and knowledge that everyone needs for work
- 22) **Training Regulations (TR)** – refers to the document promulgated and issued by TESDA consisting of competency standards, national qualifications and training guidelines for specific sectors/occupations. The TR serves as basis for establishment of qualification and certification under the PTQF. It also serves as guide for development of competency-based curricula and instructional materials including registration of TVET programs offered by TVET providers
- 23) **Underpinning Knowledge** - refers to the competency that involves in applying knowledge to perform work activities. It includes specific knowledge that is essential to the performance of the competency
- 24) **Underpinning Skills** - refers to the list of the skills needed to achieve the elements and performance criteria in the unit of competency. It includes generic and industry specific skills
- 25) **Unit of Competency** – is a component of the competency standards stating a specific key function or role in a particular job or occupation; it is the smallest component of achievement that can be assessed and certified under the PTQF

## SPECIFIC

1. **ACSR** - abbreviation of Aluminum Cable Steel Reinforced, a cable type having aluminum strands and a core of one or more steel strands. ACSR are primarily used for medium and high voltage lines and may also be used for overhead services to individual customers.
2. **Aerial Cable**- insulated cable usually supported by a bare cable, for power transmission above ground.
3. **Air Gap** - the shortest air space between two contacts exposed above an insulating barrier.
4. **Armor Rod** - an outer metal layer applied to a cable for mechanical protection. Armor rods are comprised of factory formed wire, designed to be applied to a range of conductor sizes
5. **Armor Rod (preformed)** - a spiral-formed aluminum rod, a group of which is placed around a conductor at the point of suspension to minimize vibration and to protect the conductor from burning in case of a flashover.
6. **Block and tackle** - an apparatus of pulley blocks and ropes or cables used for hauling and hoisting heavy objects.
7. **Conductor** - 1) a wire or combination of wires suitable for carrying an electrical current. Conductors may be insulated or bare. 2) any material that allows electrons to flow through it.
8. **Damper** - a device used to inhibit the vibration of conductors on a transmission line.
9. **Groundman** - a person working at ground level in support of a lineman working aloft.
10. **Guy** - a rope, cord, or cable used to steady, guide, or secure something.
11. **Guy-wire or guy-rope** -is a tensioned cable designed to add stability to structures (frequently ship masts, radio masts, wind turbines, utility poles, and tents). One end of the cable is attached to the structure, and the other is anchored to the ground at a distance from the structure's base.
12. **Guy Strain Insulator** - an insulator, normally porcelain, used to electrically isolate one part of a down guy from another. Guy Strain Insulators are made of porcelain products.
13. **Hazard** - a dangerous condition, potential or inherent, that can bring about an interruption or interfere with the expected orderly progress of an activity.

14. **Hazardous** - an atmosphere that may expose employees to the risk of death, atmosphere incapacitation, impaired ability to self-rescue unaided, injury, or acute illness.
15. **Hazardous atmospheres** - include flammable gas, vapor, or mist, airborne combustible dust, oxygen concentration below 19.5 percent or above 23.5 percent, concentrations of substances that exceed dose or permissible exposure limits, or other atmospheric condition immediately dangerous to life or health.
16. **Hot Line Order** - a statement with documentation from the Operations Supervisor to the Job Supervisor that specific work may be done on or near a line or other equipment without requiring that it be disconnected from all sources of energy. The equipment is to be considered energized or “hot.”
17. **Hotstick** - an insulated stick, usually made of fiberglass, that is used to work energized overhead conductors and operate electrical equipment that is overhead, underground and pad mounted.
18. **Insulator** - a device that is used to electrically isolate a conductor or electrical device from ground or a different electrical potential. Insulators must support the conductors and withstand both the normal operating voltage and surges due to switching and lightning. Insulators are broadly classified as either pin-type, which support the conductor above the structure, or suspension type, where the conductor hangs below the structure. Up to about 33 kV (69 kV in North America) both types are commonly used. At higher voltages only suspension-type insulators are common for overhead conductors. Insulators are usually made of wet-process porcelain or toughened glass, with increasing use of glass-reinforced polymer insulators.
19. **Lineman** - a payroll classification or title given a craftsperson whose duties include climbing wood poles or steel structures to perform work on electric power transmission and distribution circuits.
20. **Overhead power line** - is an electric power transmission line suspended by towers or poles. Since most of the insulation is provided by air, overhead power lines are generally the lowest-cost method of transmission for large quantities of electric power. Towers for support of the lines are made of wood (as-grown or laminated), steel (either lattice structures or tubular poles), concrete, aluminum, and occasionally reinforced plastics. The bare wire conductors on the line are generally made of aluminum (either plain or reinforced with steel or sometimes composite materials), though some copper wires are used in medium-voltage distribution and low-voltage connections to customer premises.
21. **Personal Protective Equipment (PPE)** - the term shall include, but is not limited to, devices designed to be worn by workers for eye, face, head, respiratory, hand, arm, body, leg, foot, and fall protection.
22. **Tag Line** - A rope used to control the position of equipment being lifted. This is not to be confused with the rope used to actually lift the equipment.

23. **Transmission line** - is the material medium or structure that forms all or part of a path from one place to another for directing the transmission of energy, such as electromagnetic waves or acoustic waves, as well as electric power transmission. Components of transmission lines include wires, coaxial cables, dielectric slabs, optical fibers, electric power lines, and waveguides.
24. **Low voltage** – less than 1000 volts, used for connection between a residential or small commercial customer and the utility.
25. **Medium Voltage** (Distribution) – between 1000 volts (1 kV) and to about 33 kV, used for distribution in urban and rural areas.
26. **High Voltage** (Sub-transmission if 33-115kV and transmission if 115kV+) – between 33 kV and about 230 kV, used for sub-transmission and transmission of bulk quantities of electric power and connection to very large consumers.
27. **Extra High Voltage** (Transmission) – over 230 kV, up to about 800 kV, used for long distance, very high power transmission.
28. **Ultra High Voltage** – higher than 800 kV.

## TRANSMISSION LINE INSTALLATION &amp; MAINTENANCE NC II COMPETENCY MAP

## BASIC COMPETENCIES

Receive and Respond to Workplace Communication	Work with Others	Demonstrate work values	Practice basic housekeeping procedures	<b>Participate in Workplace Communication</b>	<b>Work in a Team Environment</b>	<b>Practice career professionalism</b>
<b>Practice occupational health and safety procedures</b>	Lead Workplace Communication	Lead Small Working Teams	Develop and Practice Negotiating Skills With Team Members	Guide Effective Solutions to Problems Arising from Work Activities	Check and Develop the Use of Mathematical Concepts & Techniques	Use Relevant Technologies Applicable to Assigned Work
Lead in Utilizing Specialized Communication Skills	Assist in Developing Team and Individuals	Apply Problem Solving Techniques in the Workplace	Collect, analyze and organize information	Plan and Organize Work for Several Working Teams	Promote Environmental Protection	

## COMMON COMPETENCIES

<b>Apply quality standards</b>	<b>Comply with environmental protection procedures</b>	<b>Observe procedures, specifications and manual of instruction</b>	<b>Operate and Maintain T/L tools and equipment</b>	Operate a personal computer
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## CORE COMPETENCIES

Tender Diesel Engine	Operate Diesel Power plant	Maintain and Repair Diesel Engine Systems and Alternator	Service Alternator/ Generator	Diagnose and Repair Diesel Engine	Diagnose and Repair Electrical System	Overhaul Diesel Engine
<b>Perform transmission line pole erection</b>	<b>Perform overhead transmission line work</b>	<b>Perform cold-line maintenance work</b>	<b>Perform live-line maintenance work</b>	<b>Perform ground line maintenance work</b>	<b>Install emergency restoration structure (ERS)</b>	Plan transmission line maintenance job
Implement transmission line maintenance works	Inspect/Assess transmission line components' conditions					

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