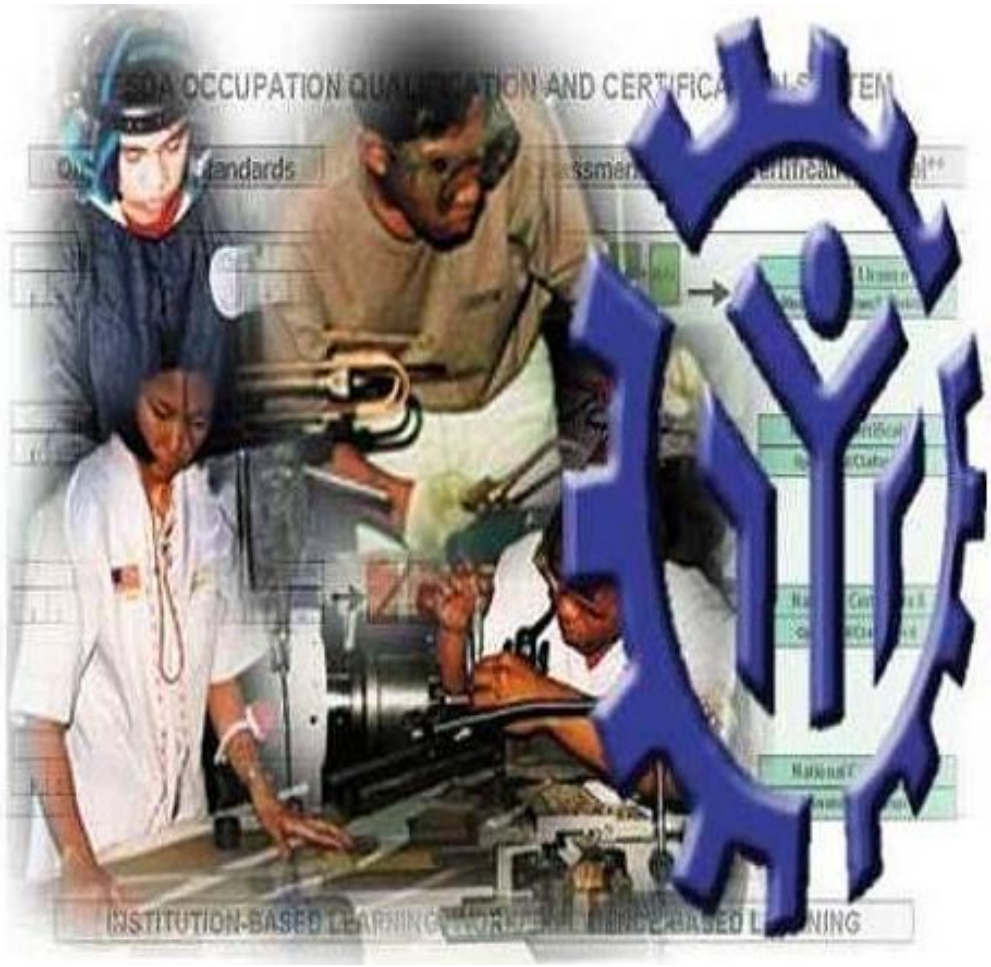
TRAINING REGULATIONS



TRANSMISSION LINE INSTALLATION AND MAINTENANCE NC III

UTILITIES SECTOR

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

Technical Education and Skills Development Act of 1994
(Republic Act No. 7796)

Section 22, "Establishment and Administration of the National Trade Skills Standards" of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skill standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Training Regulations (TR) serve as basis for the:

1 Competency assessment and certification;
2 Registration and delivery of training programs; and
3 Development of curriculum and assessment instruments.

Each TR has four sections:

Section 1 Definition of Qualification - refers to the group of competencies that describes the different functions of the qualification.

Section 2 Competency Standards - gives the specifications of competencies required for effective work performance.

Section 3 Training Arrangements - contains information and requirements in designing training program for certain Qualification. It includes curriculum design, training delivery; trainee entry requirements; tools and requirements; tools and equipment; training facilities and trainer's qualification.

Section 4 Assessment and Certification Arrangements - describes the policies governing assessment and certification procedure

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UTILITIES SECTOR

TRANSMISSION LINE INSTALLATION AND MAINTENANCE

NATIONAL CERTIFICATE LEVEL III

TRAINING REGULATIONS FOR
TRANSMISSION LINE INSTALLATION AND MAINTENANCE NC III

SECTION 1: TRANSMISSION LINE INSTALLATION AND MAINTENANCE NC III QUALIFICATION

The **Transmission Line (T/L) Installation and Maintenance NC III** Qualification consist of competencies that a person must achieve to enable him/her to perform all the required competencies of a transmission lineman as well as installation and performance of transmission line works for above 69 KV.

Specifically, this Training Regulations in Transmission Line Installation and Maintenance NC III involves competencies in installing/construction of new transmission line structures, performing overhead transmission line works, installing emergency restoration structure (ERS) and performing earth/ground resistance testing. It also includes competency in performing hotline maintenance works as elective.

This Qualification is packaged from the competency map of the Utilities industry sector) as shown in Annex A.

The units of competency comprising this qualification include the following:

Code	BASIC COMPETENCIES
5 00 311 1 09	Lead workplace communication
5 00 311 1 10	Lead small teams
5 00 311 1 11	Develop and practice negotiation skills
5 00 311 1 12	Solve problems related to work activities
5 00 311 1 13	Use mathematical concepts and techniques
5 00 311 1 14	Use relevant technologies

Code	COMMON COMPETENCIES
UTL311203	Apply quality standards
UTL311206	Comply with environmental protection procedures
UTL311201	Observe procedures, specifications and manuals of instruction
UTL311205	Operate and maintain line tools and equipment
UTL311207	Perform Computer Operations

Code	CORE COMPETENCIES
UTL741304	Install/construct new transmission line structures
UTL741305	Perform overhead transmission line works
UTL741306	Install emergency restoration structure (ERS)
UTL741307	Perform earth/ground resistance testing

Code	ELECTIVE COMPETENCIES
UTL741308	Perform hotline maintenance works

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

- Senior Transmission lineman
- 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 III.

BASIC COMPETENCIES

UNIT OF COMPETENCY : LEAD WORKPLACE COMMUNICATION

UNIT CODE : 500311109

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to lead in the dissemination and discussion of ideas, information and issues in the workplace.

ELEMENT	PERFORMANCE CRITERIA *Italicized* **terms** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Communicate information about workplace processes	1.1. Appropriate ***communication method*** is selected 1.2. Multiple operations involving several topics areas are communicated accordingly 1.3. Questions are used to gain extra information 1.4. Correct sources of information are identified 1.5. Information is selected and organized correctly 1.6. Verbal and written reporting is undertaken when required 1.7. Communication skills are maintained in all situations	1.1. Organization requirements for written and electronic communication methods 1.2. Effective verbal communication methods 1.3. Methods of Communication 1.4. Types of Question 1.5. Communication Tools 1.6. Questioning Techniques	1.1. Organizing information 1.2. Understanding and conveying intended meaning 1.3. Participating in variety of workplace discussions 1.4. Complying with organization requirements for the use of written and electronic communication methods 1.5. Reporting occupational hazards during safety meeting
2. Lead workplace discussions	2.1. Response to workplace issues are sought 2.2. Response to workplace issues are provided immediately 2.3. Constructive contributions are made to workplace discussions on such issues as production, quality and safety 2.4. Goals/objectives and action plan are undertaken in the workplace are communicated	2.1. Leading as a management function 2.2. Barriers of communication 2.3. Effective verbal communication methods 2.4. Method/techniques of discussion 2.5. How to lead discussion 2.6. How to solicit response	2.1. Communicating effectively 2.2. Consulting the crew on the prepared menu for the month

ELEMENT	PERFORMANCE CRITERIA *Italicized* **terms** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		2.7. Goal setting and action planning	
3. Identify and communicate issues arising in the workplace	3.1. Issues and problems are identified as they arise 3.2. Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3. Dialogue is initiated with appropriate personnel 3.4. Communication problems and issues are raised as they arise	3.1. Types of issues and problems in the workplace 3.2. Written and electronic communication methods 3.3. Communication barriers affecting workplace discussions	3.1. Identifying cause of problems 3.2. Identifying problems and issues 3.3. Organizing information on problems and issues 3.4. Relating problems and issues in the workplace

RANGE OF VARIABLES

VARIABLE	RANGE
1. Methods of communication	Methods of communication may include: 1.1. Non-verbal gestures 1.2. Verbal 1.3. Face to face 1.4. Two-way radio 1.5. Speaking to groups 1.6. Using telephone 1.7. Written 1.8. Internet

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Dealt with a range of communication/information at one time 1.2. Made constructive contributions in workplace issues 1.3. Sought workplace issues effectively 1.4. Responded to workplace issues promptly 1.5. Presented information clearly and effectively written form 1.6. Used appropriate sources of information 1.7. Asked appropriate questions 1.8. Provided accurate information
2. Resource Implications	The following resources **MUST** be provided: 2.1. Variety of Information 2.2. Communication tools 2.3. Simulated workplace
3. Methods of Assessment	Competency may be assessed through: 3.1. Competency in this unit must be assessed through 3.2. Direct Observation 3.3. Interview
4. Context for Assessment	4.1. Competency may be assessed in the workplace or in simulated workplace environment

UNIT OF COMPETENCY : LEAD SMALL TEAMS

UNIT CODE : 500311110

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes to lead small teams including setting and maintaining team and individual performance standards.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Provide team leadership	1.1. ***Work requirements*** are identified and presented to team members 1.2. Reasons for instructions and requirements are communicated to team members 1.3. ***Team members' queries and concerns*** are recognized, discussed and dealt with	1.1. Company policies and procedures 1.2. How performance expectations are set 1.3. Methods of Monitoring Performance 1.4. Client expectations 1.5. Team member's duties and responsibilities 1.6. Definition of Team 1.7. Skills and techniques in promoting team building 1.8. Up-to-date dissemination of instructions and requirements to members 1.9. Art of listening and treating individual team members concern	1.1. Communication skills required for leading teams 1.2. Team building skills 1.3. Negotiating skills 1.4. Evaluation skills
2. Assign responsibilities	2.1. Duties and responsibilities are allocated having regard to the skills, knowledge and aptitude required to properly undertake the assigned task and according to company policy 2.2. Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible	2.1. Concept of delegation 2.2. How to delegate 2.3. Understanding individual differences 2.4. Methods of monitoring performance 2.5. Duties and responsibilities of each team member 2.6. Knowledge in identifying each team member duties and responsibilities	2.1. Delegating skills 2.2. Identifying individual skills, knowledge and attitude as basis for allocating responsibilities 2.3. Identifying each team member duties and responsibilities
3. Set performance expectations for team members	3.1. Performance expectations are established based on client needs and	3.1. Definition of performance indicators/ criteria	3.1. Identifying performance indicators

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	according to assignment requirements 3.2. Performance expectations are based on individual team members duties and area of responsibility 3.3. Performance expectations are discussed and disseminated to individual team members	3.2. Definition of team goals and expectations 3.3. Methods of monitoring performance 3.4. Client expectations 3.5. Team members duties and responsibilities 3.6. Defining performance expectations criteria	3.2. Evaluating performance 3.3. Setting individual performance target/ expectation indicators
4. Supervised team performance	4.1. ***Monitoring of performance*** takes place against defined performance criteria and/or assignment instructions and corrective action taken if required 4.2. Team members are provided with ***feedback***, positive support and advice on strategies to overcome any deficiencies 4.3. ***Performance issues*** which cannot be rectified or addressed within the team are referenced to appropriate personnel according to employer policy 4.4. Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer needs and satisfaction 4.5. Team operations are monitored to ensure that employer/client needs and requirements are met 4.6. Follow-up communication is provided on all issues affecting the team	4.1. Understanding Monitoring of work 4.2. How to undertake corrective action 4.3. Understanding feedback and procedure 4.4. Feedback reporting procedure 4.5. Methods of monitoring performance 4.6. Team member's duties and responsibilities 4.7. Monitoring team operation to ensure client needs and satisfaction	4.1. Monitoring skills 4.2. Setting priorities 4.3. Evaluating performance 4.4. Informal/ formal counseling skills

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	4.7. All relevant documentation is completed in accordance with company procedures		

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work requirements	1.1. Client Profile 1.2. Assignment instructions
2. Team member's concerns	2.1. Roster/shift details
3. Monitor performance	3.1. Formal process 3.2. Informal process
4. Feedback	4.1. Formal process 4.2. Informal process
5. Performance issues	5.1. Work output 5.2. Work quality 5.3. Team participation 5.4. Compliance with workplace protocols 5.5. Safety 5.6. Customer service

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Maintained or improved individuals and/or team performance given a variety of possible scenario 1.2. Assessed and monitored team and individual performance against set criteria 1.3. Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf 1.4. Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed 1.5. Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members
2. Resource Implications	The following resources **MUST** be provided: 2.1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2. Materials relevant to the proposed activity or task
3. Methods of Assessment	Competency may be assessed through: 3.1. Direct observations of work activities of the individual member in relation to the work activities of the group 3.2. Observation of simulation and/or role play involving the participation of individual member to the attainment of organizational goal 3.3. Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
4. Context for Assessment	4.1. Competency assessment may occur in workplace or any appropriately simulated environment 4.2. Assessment shall be observed while task are being undertaken whether individually or in-group

UNIT OF COMPETENCY: DEVELOP AND PRACTICE NEGOTIATION SKILLS

UNIT CODE : 500311111

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes required to collect information in order to negotiate to a desired outcome and participate in the negotiation.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan negotiations	1.1. Information on ***preparing for negotiation*** is identified and included in the plan 1.2. Information on creating ***nonverbal environments*** for positive negotiating is identified and included in the plan 1.3. Information on ***active listening*** is identified and included in the plan 1.4. Information on different ***questioning techniques*** is identified and included in the plan 1.5. Information is checked to ensure it is correct and up-to- date	1.1. Knowledge on Codes of practice and guidelines for the organization 1.2. Knowledge of organizations policy and procedures for negotiations 1.3. Decision making and conflict resolution strategies procedures 1.4. Concept of negotiation	1.1. Communication skills (verbal and listening) 1.2. Active listening 1.3. Setting conflict 1.4. Preparing conflict resolution 1.5. Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation 1.6. Interpersonal skills to develop rapport with other parties
2. Participate in negotiations	2.1 Criteria for successful outcome are agreed upon by all parties 2.2 Desired outcome of all parties are considered 2.3 Appropriate language is used throughout the negotiation 2.4 A variety of questioning techniques are used 2.5 The issues and processes are documented and agreed upon by all parties 2.6 Possible solutions are discussed and their viability assessed 2.7 Areas for agreement are confirmed and recorded 2.8 Follow-up action is agreed upon by all parties	2.1 Outcome of negotiation 2.2 Knowledge on Language 2.3 Different Questioning techniques 2.4 Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation	2.1 Negotiating skill 2.2 Communication skills (verbal and listening) 2.3 Observation skills 2.4 Interpersonal skills to develop rapport with other parties 2.5 Applying effective questioning techniques 2.6 Setting conflict

RANGE OF VARIABLES

VARIABLE	RANGE
1. Preparing for negotiation	1.1 Background information on other parties to the negotiation 1.2 Good understanding of topic to be negotiated 1.3 Clear understanding of desired outcome/s 1.4 Personal attributes 1.4.1 self-awareness 1.4.2 self esteem 1.4.3 objectivity 1.4.4 empathy 1.4.5 respect for others 1.5 Interpersonal skills 1.5.1 listening/reflecting 1.5.2 nonverbal communication 1.5.3 assertiveness 1.5.4 behavior labeling 1.5.5 testing understanding 1.5.6 seeking information 1.5.7 self-disclosing 1.6 Analytic skills 1.6.1 observing differences between content and process 1.6.2 identifying bargaining information 1.6.3 applying strategies to manage process 1.6.4 applying steps in negotiating process 1.6.5 strategies to manage conflict 1.6.6 steps in negotiating process 1.6.7 options within organization and externally for resolving conflict
2. Nonverbal environments	2.1 Friendly reception 2.2 Warm and welcoming room 2.3 Refreshments offered 2.4 Lead in conversation before negotiation begins
3. Active listening	3.1 Attentive 3.2 Don't interrupt 3.3 Good posture 3.4 Maintain eye contact 3.5 Reflective listening
4. Questioning techniques	4.1 Direct 4.2 Indirect 4.3 Open-ended

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Demonstrated sufficient knowledge of the factors influencing negotiation to achieve agreed outcome 1.2. Participated in negotiation with at least one person to achieve an agreed outcome
2. Resource Implications	The following resources **MUST** be provided: 2.1. Room with facilities necessary for the negotiation process 2.2. Human resources (negotiators)
3. Methods of Assessment	Competency may be assessed through: 3.1. Observation/demonstration and questioning 3.2. Portfolio assessment 3.3. Oral and written questioning 3.4. Third party report
4. Context for Assessment	4.1. Competency to be assessed in real work environment or in a simulated workplace setting.

UNIT OF COMPETENCY : SOLVE PROBLEMS RELATED TO WORK ACTIVITIES

UNIT CODE : 500311112

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem solving techniques and to determine and resolve the root cause of problems.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the problem	1.1. Variances are identified from normal operating parameters; and product quality 1.2. Extent, cause and nature of the problem are defined through observation, investigation and ***analytical techniques*** 1.3. ***Problems*** are clearly stated and specified	1.1. Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations 1.2. Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations 1.3. Relevant equipment and operational processes 1.4. Enterprise goals, targets and measures 1.5. Enterprise quality, OHS and environmental requirement 1.6. Enterprise information systems and data collation 1.7. Industry codes and standards 1.8. Normal operating parameters and product quality 1.9. Identifying and clarifying the nature of problem	1.1. Using range of formal problem solving techniques 1.2. Identifying and clarifying the nature of the problem 1.3. Evaluating the effectiveness of a present process in the workplace 1.4. Applying analytical techniques
2. Determine fundamental causes of the problem	2.1 Possible causes are identified based on experience and the use of problem solving tools/ analytical techniques.	2.1 Relevant equipment and operational processes 2.2 Enterprise goals, targets and measures	2.1 Analysis of root causes

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.2 Possible cause statements are developed based on findings 2.3 Fundamental causes are identified per results of investigation conducted	2.3 Enterprise quality, OHS and environmental requirements 2.4 Enterprise information systems and data collation 2.5 Industry codes and standards	
3. Determine corrective action	3.1. All possible options are considered for resolution of the problem 3.2. Strengths and weaknesses of possible options are considered 3.3. Corrective actions are determined to resolve the problem and possible future causes 3.4. **Action *plans*** are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures	3.1. Understanding the procedure in undertaking corrective action 3.2. Principles of decision making strategies and techniques 3.3. Enterprise information systems and data collation 3.4. Action planning	3.1. Identifying and clarifying the nature of the problem 3.2. Devising the best solution 3.3. Evaluating the solution 3.4. Implementing developed plan to rectify the problem 3.5. Implementing corrective and preventive actions based on root cause analysis
4. Provide recommendation/s to manager	4.1 Report on recommendations is prepared according to procedures. 4.2 Recommendations are presented to appropriate personnel. 4.3 Recommendations are followed-up, if required	4.1 How to make a report and recommendation	4.1 Writing report and recommendations

RANGE OF VARIABLES

VARIABLE	RANGE
1. Analytical techniques	1.1. Brainstorming 1.2. Intuitions/Logic 1.3. Cause and effect diagrams 1.4. Pareto analysis 1.5. SWOT analysis 1.6. Gant chart, Pert CPM and graphs 1.7. Scatter grams
2. Problem	2.1. Non – routine process and quality problems 2.2. Equipment selection, availability and failure 2.3. Teamwork and work allocation problem 2.4. Safety and emergency situations and incidents
3. Action plans	3.1. Priority requirements 3.2. Measurable objectives 3.3. Resource requirements 3.4. Timelines 3.5. Co-ordination and feedback requirements 3.6. Safety requirements 3.7. Risk assessment 3.8. Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Identified the problem 1.2. Determined the fundamental causes of the problem 1.3. Determined the correct / preventive action 1.4. Provided recommendation to manager These aspects may be best assessed using a range of scenarios / case studies / what ifs as a stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.
2. Resource Implications	2.1. Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios / case studies / what ifs will be required as well as bank of questions which will be used to probe the reason behind the observable action.
3. Methods of Assessment	Competency may be assessed through: 3.1. Case studies on solving problems in the workplace 3.2. Observation The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.
4. Context for Assessment	4.1. In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

UNIT OF COMPETENCY: USE MATHEMATICAL CONCEPTS AND TECHNIQUES

UNIT CODE : 500311113

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required in the application of mathematical concepts and techniques.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify mathematical tools and techniques to solve problem	1.1. Problem areas are identified based on given condition 1.2. ***Mathematical techniques*** are selected based on the given problem	1.1. Fundamental operation (addition, subtraction, division, multiplication) 1.2. Units of measurement and its conversion 1.3. Fundamental of units 1.4. Standard formulas 1.5. Basic measuring tools/devices 1.6. Measurement system 1.7. Basic measuring tools/devices 1.8. Steps in solving problem	1.1. Identifying and selecting different measuring tools 1.2. Applying different formulas in solving problems 1.3. Describing the units of measurement and fundamental units 1.4. Stating arithmetic calculations involving the following; addition, subtraction, division, multiplication 1.5. Applying theory into actual application on shipboard catering processes
2. Apply mathematical procedure/ solution	2.1. Mathematical techniques are applied based on the problem identified 2.2. Mathematical computations are performed to the level of accuracy required for the problem 2.3. Results of mathematical computation is determined and verified based on job requirements	2.1. Problem-based questions 2.2. Estimation 2.3. Use of mathematical tools and standard formulas 2.4. Mathematical techniques	2.1. Solving mathematical computations 2.2. Converting Metric to English 2.3. Selecting and using appropriate and efficient techniques and strategies to solve problems
3. Analyze results	3.1. Result of application is reviewed based on expected and required specifications and outcome 3.2. ***Appropriate action*** is applied in case of error	3.1. Techniques in analyzing the results 3.2. Process in reviewing the results 3.3. Precision and accuracy 3.4. Four fundamental operations 3.5. Steps in solving problem	3.1. Analyzing the result based on the specified requirements 3.2. Interpreting and communicating the results of the analysis

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		3.6. Standard formulas 3.7. Conversion measurement	

RANGE OF VARIABLES

VARIABLE	RANGE
1. Mathematical techniques	May include but are not limited to: 1.1 Four fundamental operations 1.2 Measurements 1.3 Use/Conversion of units of measurements 1.4 Use of standard formulas
2. Appropriate action	2.1 Review in the use of mathematical techniques (e.g. recalculation, re-modeling) 2.2 Report error to immediate superior for proper action

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1. Identified, applied and reviewed the use of mathematical concepts and techniques to workplace problems
2. Resource Implications	The following resources **MUST** be provided: 2.1. Calculator 2.2. Basic measuring tools 2.3. Case Problems
3. Methods of Assessment	Competency may be assessed through: 3.1. Authenticated portfolio 3.2. Written Test 3.3. Interview/Oral Questioning 3.4. Demonstration
4. Context for Assessment	4.1. Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY: USE RELEVANT TECHNOLOGIES

UNIT CODE : 500311114

UNIT DESCRIPTOR : This unit of competency covers the knowledge, skills, and attitude required in selecting, sourcing and applying appropriate and affordable technologies in the workplace.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Study/select appropriate technology	1.1 Usage of different ***technologies*** is determined based on job requirements 1.2 Appropriate technology is selected as per work Specification	1.1 Awareness on technology and its function 1.2 Communication techniques 1.3 Health and safety procedure 1.4 Company policy in relation to relevant technology 1.5 Machineries/ equipment and their application 1.6 Software programs	1.1 Identifying relevant technology on job
2. Apply relevant technology	2.1 Relevant technology is effectively used in carrying out function 2.2 Applicable software and hardware are used as per task requirement 2.3 ***Management concepts*** are observed and practiced as per established industry practices	2.1 Knowledge on operating instructions 2.2 Understanding software and hardware system 2.3 Communication techniques 2.4 Health and safety procedure 2.5 Company policy in relation to relevant technology 2.6 Different management concepts 2.7 Technology adaptability	2.1 Applying relevant technology 2.2 Communicating skills 2.3 Using software applications skills 2.4 Conducting risk assessment
3. Maintain/ enhance relevant technology	3.1 Maintenance of technology is applied in accordance with the ***industry standard operating procedure***, ***manufacturer's operating guidelines*** and ***occupational health and safety procedure*** to ensure its operative ability 3.2 Updating of technology is maintained through continuing education or training in accordance with job requirement	3.1 Awareness on technology and its function 3.2 Repair and maintenance procedure 3.3 Health and safety procedure 3.4 Company policy in relation to relevant technology 3.5 Upgrading of technology	3.1 Performing basic troubleshooting skills 3.2 Identifying failures or defects 3.3 Communication skills 3.4 Applying corrective and preventive maintenance

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.3 Technology failure/ defect is immediately reported to the concern/responsible person or section for ***appropriate action***	3.6 Organizational set-up/work flow	

RANGE OF VARIABLES

VARIABLE	RANGE
1. Technology	May include but are not limited to: 1.1 Office technology 1.2 Industrial technology 1.3 System technology 1.4 Information technology 1.5 Training technology
2. Management concepts	May include but not limited to: 2.1 Real Time Management 2.2 KAIZEN or continuous improvement 2.3 5s 2.5 Total Quality Management 2.6 Other management/productivity tools
3. Industry standard operating procedure	3.1 Written guidelines relative to the usage of office technology/equipment 3.2 Verbal advise/instruction from the co-worker
4. Manufacturer's operating guidelines/ instructions	4.1 Written instruction/manuals of specific technology/ equipment 4.2 General instruction manual 4.3 Verbal advise from manufacturer relative to the operation of equipment
5. Occupational health and safety procedure	5.1 Relevant statutes on OHS 5.2 Company guidelines in using technology/equipment
6. Appropriate action	6.1 Implementing preventive maintenance schedule 6.2 Coordinating with manufacturer's technician

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Studied and selected appropriate technology consistent with work requirements 1.2 Applied relevant technology 1.3 Maintained and enhanced operative ability of relevant technology
2. Resource Implications	The following resources **MUST** be provided: 2.1 Relevant technology 2.2 Interview and demonstration questionnaires 2.3 Assessment packages
3. Methods of Assessment	Competency must be assessed through: 3.1 Interview 3.2 Actual demonstration 3.3 Authenticated portfolio (related certificates of training/seminar)
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or simulated environment

COMMON COMPETENCIES

UNIT TITLE : APPLY QUALITY STANDARDS

UNIT CODE : UTL311203

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

ELEMENT	PERFORMANCE CRITERIA ***Italicized Bold*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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 ***materials or component parts*** are checked against workplace standards and specifications 1.3. Faulty material or components related to work are identified and isolated 1.4. ***Faults*** 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	1.1. Relevant production processes, materials and products 1.2. Characteristics of materials, software and hardware used in production processes 1.3. Quality checking procedures 1.4. Quality Workplace procedures 1.5. Identification of faulty materials related to work	1.1. Reading skills required to interpret work instruction 1.2. Critical thinking 1.3. Interpreting work instructions
2. Assess own work	2.1. ***Documentation*** 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 ***quality standards***, causes are documented and reported in accordance with the workplace standards operating procedures	2.1. Safety and environmental aspects of production processes 2.2. Fault identification and reporting 2.3. Workplace procedure in documenting completed work 2.4. Workplace Quality Indicators	2.1. Carry out work in accordance with OHS policies and procedures

ELEMENT	PERFORMANCE CRITERIA ***Italicized Bold*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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 ***customer*** satisfaction is monitored	3.1. Quality improvement processes 3.2. Company customers defined	3.1. Solution providing and decision-making 3.2. Practice company process improvement procedure

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

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Carried out work in accordance with the company's standard operating procedures 1.2. Performed task according to specifications 1.3. Reported defects detected in accordance with standard operating procedures 1.4. Carried out work in accordance with the process improvement procedures
2. Resource implication	2.1. Materials and component parts and equipment to be used in a real or simulated electronic production situation
3. Method of assessment	3.1. The assessor may select at least two (2) of the following assessment methods to objectively assess the candidate: 3.1.1. Observation 3.1.2. Questioning 3.1.3. Practical demonstration
4. Context of Assessment	4.1. Assessment may be conducted in the workplace or in a simulated work environment.

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

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Access information concerning environmental protection regulations and procedures	1.1. Relevant provisions of environmental 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. ***Information*** 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 appropriate personnel	1.1. Relevant environmental protection regulations & codes of practice 1.2. Environmental risks associated with workplace operations and related precautions to control the risk 1.3. Environmental protection standards required in the workplace	1.1. Workplace reporting and recording processes and procedures 1.2. Communication skills 1.3. Accessing information and data 1.4. Ability to recognize potential environmental risks and ways of minimizing them
2. Implement and monitor procedures concerning environmental hazards	2.1 Existing and potential ***environmental hazards*** in the workplace are identified and reported 2.2 Identified hazards are assessed in relation to relevant environmental protection policies 2.3 ***Workplace procedures for dealing with hazardous events*** are implemented wherever necessary to ensure that prompt control action is taken 2.4 ***Personal protective equipment (PPE)*** are obtained and used in accordance with job requirements	2.1 Relevant environmental protection regulations & codes of practice 2.2 Workplace procedures and guidelines for implementing and monitoring procedures concerning environmental hazards 2.3 Workplace environmental hazards and related hazard	2.1 Workplace reporting and recording processes and procedures 2.2 Communication skills 2.3 Problem solving skills 2.4 Ability to: 2.5 recognize potential environmental hazards and ways of minimizing them 2.6 counsel, advise and inform

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.5 Hazardous events are investigated to identify causes, and control measures are implemented to prevent recurrence and minimize risks of such events	control measures 2.4 Equipment and resources required when implementing and monitoring environmental protection procedures 2.5 Organizational structure and site layout	others on environmental protection matters 2.7 identify and correctly use equipment and vehicles in accordance with environmental protection regulations and guidelines
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	3.1 Relevant environmental protection regulations & codes of practice 3.2 Workplace procedures and guidelines for implementing and monitoring environmental control procedures 3.3 Equipment and resources required when implementing and monitoring environmental control procedures 3.4 Organizational structure and site layout	3.1 Workplace reporting and recording processes and procedures 3.2 Communication skills 3.3 Accessing information and data 3.4 Problem solving skills 3.5 Ability to: 3.5.1 counsel, advise and inform others on environmental control procedures 3.5.2 identify and correctly use equipment and vehicles in accordance with environmental control procedures, regulations and guidelines

RANGE OF VARIABLES

VARIABLE	RANGE
1 environment	Environment may include: 1.1 indoor 1.2 outdoor 1.3 marine 1.4 atmospheric
2 Information	Information/documents may include: 2.1 Workplace procedures and practices related to environmental protection, including all financial, operating and customer service policies and procedures 2.2 OHS and environmental protection regulations 2.3 Workplace housekeeping procedures and policies 2.4 Code of practice for environmental protection 2.5 Material safety data sheets 2.6 Policies and procedures for entry and work in confined spaces 2.7 Manufacturer's instructions concerning the use and servicing of equipment 2.8 Emergency procedures 2.9 Regulations and policies concerning noise, waste disposal/reprocessing, handling of dangerous goods/hazardous substances and other environmental protection issues 2.10 Standards and certification requirements 2.11 Quality assurance procedures
3 Appropriate personnel	Appropriate personnel may include: 3.1 Workplace personnel including supervisors and management 3.2 Site visitors 3.3 Contractors 3.4 Official representatives
4 Environmental hazards	4.1 Oils and lubricants 4.2 Exhaust fumes 4.3 Gas 4.4 Smoke 4.5 Chemicals and detergents 4.6 Rubbish 4.7 Noise 4.8 Wastes

VARIABLE	RANGE
5 Workplace procedures for dealing with hazardous events	Procedures may include: 5.1 Inspection and housekeeping 5.2 Maintenance including plant and equipment 5.3 Purchasing 5.4 Evacuation 5.5 Hazardous substance containment 5.6 Operational instruction 5.7 Environmental information including incident and management practices 5.8 Specific hazardous materials policies and procedures 5.9 Risk assessment and control 5.10 First aid
6 Personal protective equipment (PPE)	PPE may include: 6.1 Gloves 6.2 Safety headwear and footwear 6.3 Safety glasses 6.4 Two-way radios 6.5 High visibility clothing

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Identified and monitored environmental hazards in the workplace 1.2 Implemented effective procedures for dealing with hazardous events 1.3 Monitored workplace adherence to environmental practices 1.4 Communicated effectively with the team members
2. Resource implications	The following resources should be provided: 2.1 Environmental protection regulations and guidelines 2.2 OHS regulations and hazard prevention policies and procedures 2.3 workplace environmental protection policies, procedures and instructions 2.4 equipment/vehicle manufacturer's operating and servicing instructions
3. Methods of assessment	Competency should be assessed through: 3.1 Direct observation 3.2 Oral or written questioning 3.3 Questions/interview Assessment of underpinning knowledge and practical skills may be combined
4. Context of assessment	4.1 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines 4.2 Assessment may be conducted in the workplace or a simulated environment

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.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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	1.1 Types of manuals used in transmission lines (T/L) 1.2 Identification of symbols used in the manuals	1.1 Reading and comprehension skills 1.2 Identifying and interpreting T/L manuals and specifications 1.3 Accessing information and data
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	2.1 Types of manuals used in transmission lines (T/L) 2.2 Types of symbols used in manuals 2.3 Identification of units of measurements 2.4 Unit conversion	2.1 Reading and comprehension skills 2.2 Identifying and interpreting T/L manuals and specifications 2.3 Accessing information and data 2.4 Applying conversion of units of measurements
3. Apply information in manual	3.1 ***Manual*** 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	3.1 Types of manuals used in transmission lines (T/L) 3.2 Types and application of symbols used in the manuals 3.3 Unit conversion	3.1 Reading and comprehension skills 3.2 Applying information from manuals
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	4.1 Types of manuals used in transmission lines (T/L) 4.2 Manual storing and maintaining procedures	4.1 Reading and comprehension skills 4.2 Storing and maintaining manuals

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

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Identified and accessed specification/manuals as per job requirements 1.2 Interpreted manuals in accordance with industry practices 1.3 Applied information in manuals according to the given task 1.4 Stored manuals in accordance with company requirements
2. Resource implications	The following resources should be provided: 2.1 All manuals/catalogues relative to construction sector
3. Methods of assessment	Competency should be assessed through: 3.1 Direct observation 3.2 Questions/interview Assessment of underpinning knowledge and practical skills may be combined
4. Context of assessment	4.1 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines 4.2 Assessment may be conducted in the workplace or a simulated environment

UNIT OF COMPETENCY : OPERATE AND MAINTAIN LINE 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 (*Italicized Bold* terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1. Work instruction is secured and interpreted according to ***job requirements*** 1.2. Relevant ***occupational health and safety requirements*** are identified following job specifications 1.3. Relevant transmission line ***tools, equipment and hardware*** are identified and requested in accordance with job specifications	1.1. Relevant occupational health and safety standards 1.2. Types and usage of transmission line tools and equipment 1.3. Basic preventive maintenance servicing for transmission line equipment	1.1. Following and complying occupational health and safety standards 1.2. Following procedures for the safe use of transmission line tools and equipment 1.3. Performing basic preventive maintenance servicing for transmission line equipment
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	2.1. Types and functions of PPEs 2.2. Types and usage of transmission line tools and equipment 2.3. Basic preventive maintenance servicing for transmission line equipment 2.4. Proper testing of transmission hot line tools	2.1. Following and complying occupational health and safety standards 2.2. Following procedures for the safe use of transmission line tools and equipment 2.3. Performing basic preventive maintenance servicing for transmission line equipment 2.4. Testing skills
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	3.1. Proper usage of PPEs 3.2. Proper procedure for the use of transmission line tools and equipment	3.1. Using PPEs 3.2. Following procedures for the safe use of transmission line tools and equipment 3.3. Performing basic preventive

ELEMENT	PERFORMANCE CRITERIA (***Italicized Bold*** terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		3.3. Basic preventive maintenance servicing for transmission line equipment	maintenance servicing for transmission line equipment
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	4.1. Classification of transmission line tools and equipment 4.2. Proper safety procedure for the use of transmission line tools and equipment 4.3. Basic preventive maintenance servicing for transmission line equipment	4.1. Classifying transmission line tools and equipment 4.2. Following and complying occupational health and safety standards 4.3. Following procedures for the safe use of transmission line tools and equipment 4.4. Performing basic preventive maintenance servicing for transmission line equipment
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 OHSA regulations	5.1. Types and usage of lubricants for transmission line equipment 5.2. Proper procedure for the use and maintenance of transmission line tools and equipment 5.3. Basic preventive maintenance servicing for transmission line equipment 5.4. Applicable OHSA regulations in preventive maintenance	5.1. Identifying types and usage of lubricants 5.2. Following procedures for the safe use and maintenance of transmission line tools and equipment 5.3. Performing basic preventive maintenance servicing for transmission line equipment 5.4. Following OHSA regulations

ELEMENT	PERFORMANCE CRITERIA (***Italicized Bold*** terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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	6.1. Proper procedure for the inventory and storage of transmission line tools and equipment	6.1. Following procedures for the inventory and storage of transmission line tools and equipment 6.2. Inventory skills 6.3. Proper storage and handling skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Job requirements	1.1. Erect pole 1.2. Perform overhead transmission line work 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) 2.1.1 Safety hat 2.1.2 Safety goggles 2.1.3 Safety gloves 2.1.4 Safety shoes 2.1.5 Working clothes 2.2. Installation of grounding cluster
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

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Demonstrates ability to identify and comply with occupational health and safety standards in operating and maintaining transmission line tools and equipment 1.2. Demonstrates ability to identify and safely use transmission tools and equipment 1.3. Demonstrates ability to perform basic preventive maintenance servicing for transmission line equipment
2. Resource Implications	The following resources must be available: 2.1. Transmission line tools, equipment and PPE 2.2. Work area
3. Method of assessment	3.1. Observation and Oral questioning 3.2. Demonstration with oral questioning 3.3. Written test
4. Context of assessment	4.1. Competency may be assessed in the workplace or in a simulated workplace setting 4.2. Assessment shall be undertaken either individually or part of team under limited supervision

UNIT TITLE : **PERFORM COMPUTER OPERATIONS**
UNIT CODE : **UTL311207**
UNIT DESCRIPTOR : This unit covers the knowledge, skills, (and) attitudes and values needed to perform computer operations which include inputting, accessing, producing and transferring data using the appropriate hardware and software

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for task to be undertaken	1.1. Requirements of task are determined 1.2. Appropriate ***hardware*** and ***software*** are selected according to task assigned and required outcome 1.3. Task is planned to ensure ***OH&S guidelines*** and procedures are followed	1.1. Main types of computers and basic features of different operating systems 1.2. Main parts of a computer 1.3. Information on hardware and software 1.4. Data security guidelines	1.1. Reading and comprehension skills required to interpret work instruction and to interpret basic user manuals. 1.2. Communication skills to identify lines of communication, request advice, follow instructions and receive feedback. 1.3. Interpreting user manuals and security guidelines
2. Input data into computer	2.1. Data are entered into the computer using appropriate program/application in accordance with company procedures 2.2. Accuracy of information is checked and information is saved in accordance with standard operating procedures 2.3. Inputted data are stored in ***storage media*** according to requirements 2.4. Work is performed within ***ergonomic guidelines***	2.1. Basic ergonomics of keyboard and computer user 2.2. Storage devices and basic categories of memory 2.3. Relevant types of software	2.1. Technology skills to use equipment safely including keyboard skills. 2.2. Entering data
3. Access information using computer/ smartphone	3.1. Correct program/application is selected based on job requirements 3.2. Program/application containing the information required is accessed according to company procedures 3.3. ***Desktop icons*** are correctly selected, opened and closed for navigation purposes	3.1. General security, privacy legislation and copyright 3.2. Productivity Application 3.3. Business Application	3.1. Accessing information 3.2. Searching and browsing files and data

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.4. Keyboard techniques are carried out in line with OH&S requirements for safe use of keyboards		
4. Produce/ output data using computer system	4.1. Entered data are processed using appropriate software commands 4.2. Data printed out as required using computer hardware/peripheral devices in accordance with standard operating procedures 4.3. Files, data are transferred between compatible systems using computer software, hardware/ peripheral devices in accordance with standard operating procedures	4.1. Computer application in printing, scanning and sending facsimile 4.2. Types and function of computer peripheral devices	4.1. Computer data processing 4.2. Printing of data 4.3. Transferring files and data
5. Maintain computer equipment and systems	5.1. Systems for cleaning, minor ***maintenance*** and replacement of consumables are implemented 5.2. Procedures for ensuring security of data, including regular back-ups and virus checks are implemented in accordance with standard operating procedures 5.3. Basic file maintenance procedures are implemented in line with the standard operating procedures	5.1. Basic internet operation 5.1.1. Web address 5.1.2. Types and functions of search engines 5.2. Different web browser security features and maintenance	5.1. Locating information using browser 5.2. Internet browsing

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hardware and peripheral devices	May include: 1.1. Personal computers 1.2. Networked systems 1.3. Communication equipment 1.4. Printers 1.5. Scanners 1.6. Keyboard 1.7. Mouse
2. Software	Software includes the following but not limited to: 2.1. Word processing packages 2.2. Data base packages 2.3. Internet 2.4. Spreadsheets
3. OH & S guidelines	3.1. OHS guidelines 3.2. Enterprise procedures
4. Storage media	Storage media include the following but not limited to: 4.1. CDs 4.2. zip disks 4.3. hard disk drives, local and remote 4.4. cloud storage
5. Ergonomic guidelines	5.1. Types of equipment used 5.2. Appropriate furniture 5.3. Seating posture 5.4. Lifting posture 5.5. Visual display unit screen brightness
6. Desktop icons	Icons include the following but not limited to: 6.1. directories/folders 6.2. files 6.3. network devices 6.4. recycle bin
7. Maintenance	May include: 7.1. Creating more space in the hard disk 7.2. Reviewing programs 7.3. Deleting unwanted files 7.4. Backing up files 7.5. Checking hard drive for errors 7.6. Using up to date anti-virus programs 7.7. Cleaning dust from internal and external surfaces

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Selected and used hardware components correctly and according to the task requirement 1.2. Identified and explain the functions of both hardware and software used, their general features and capabilities 1.3. Produced accurate and complete data in accordance with the requirements 1.4. Used appropriate devices and procedures to transfer files/data accurately 1.5. Maintained computer system
2. Resource implication	2.1. Computer hardware with peripherals 2.2. Appropriate software
3. Method of assessment	3.1. The assessor may select two of the following assessment methods to objectively assess the candidate: 3.1.1. Observation 3.1.2. Questioning 3.1.3. Practical demonstration
4. Context of Assessment	4.1. Assessment may be conducted in the workplace or in a simulated work environment

CORE COMPETENCIES

UNIT OF COMPETENCY : INSTALL/CONSTRUCT NEW TRANSMISSION LINE STRUCTURES

UNIT CODE : UTL741304

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

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1. Work instruction is secured according to job requirements 1.2. Relevant ***occupational health and safety requirements*** are identified following job specifications 1.3. Appropriate ***tools, equipment and hardware*** are identified and requested in accordance with job specifications	1.1. Usage and functions of appropriate tools, equipment and hardware. 1.2. Design and specification of transmission line (T/L) structures 1.3. DOLE-OSHS Rule 1410 – Construction Safety 1.4. Basic Math (MDAS) 1.5. Written and oral communication	1.1. Communication skills 1.2. Interpretation skills 1.3. Mathematical skills 1.4. Skills in identifying T/L hardware, tools and equipment
2. Prepare hardware, transmission line tools and equipment	2.1 Personal protective equipment (PPE) are obtained following job requirements 2.2 Appropriate tools, equipment and hardware are acquired and secured in line with job requirements 2.3 Operational condition of transmission line tools and equipment are checked in accordance with its corresponding manual and company standards.	2.1 DOLE-OSHS Rule 1080 – Personal Protective Equipment and Devices 2.2 Usage and functions of appropriate materials, tools and equipment 2.3 OSH requirement 2.4 Basic Math (MDAs) 2.5 Written and oral communication	2.1 Communication skills 2.2 Interpretation skills 2.3 Mathematical skills 2.4 Skills in identifying T/L hardware, tools and equipment
3. Perform pole staking and excavation	3.1. Appropriate tools, equipment and hardware are used in line with job requirements 3.2. Personal protective equipment (PPE) are used following job requirements 3.3. Pole staking is performed based on area condition. 3.4 ***Excavation procedure*** is performed following established company standard and safety requirements	3.1. Usage of appropriate PPE 3.2. Usage and functions of appropriate materials, tools and equipment 3.3. Design and specification of the pole structures 3.4. Excavation procedure per company standards	3.1. Communication skills 3.2. Interpretation skills 3.3. Mathematical skills 3.4. Skills in identifying T/L hardware, tools and equipment 3.5. Skills in proper excavation of

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		3.5. DOLE-OSHS Rule 1413 – Excavation 3.1. Soil bearing capacity 3.2. Basic Math (MDAs) 3.2.1 Depth of hole 3.2.2 Diameter of pole hole 3.3. Written and oral communication	pole and anchor holes
4. Transport and drag pole to job site	4.1. Appropriate tools and equipment are used in line with job requirements 4.2. Personal protective equipment (PPE) are used following job requirements 4.3. ***Loading and unloading method*** for poles is performed following safety requirements 4.4. Pole*s* are hauled based on proper hauling procedures 4.5. Poles are manually dragged, if necessary, based on proper dragging procedure	4.1. Identification of appropriate hardware tools and equipment. 4.2. Usage of appropriate PPE 4.3. Usage and functions of appropriate materials, tools and equipment 4.4. Traffic rules and regulation. 4.5. Rigging technique 4.6. Hauling and manual dragging techniques 4.7. DOLE-OSHS Rule 1428 – Lines, Blocks, Rigging 4.8. Simple machine principle 4.9. Basic Math (MDAS) 4.10. Written, oral and hand signal communication	4.1. Communication skills 4.2. Interpretation skills 4.3. Mathematical skills 4.4. Rigging skills 4.4.1 Knot tying, splicing 4.4.2 Reeving 4.4.3 Loading and unloading

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
5. Perform pole-setting	5.1. Appropriate tools, equipment and hardware are used in line with job requirements 5.2. Personal protective equipment (PPE) are used following job requirements 5.3. ***Pole setting method*** is performed in line with job requirements 5.4. Housekeeping procedure is performed following company policies and procedures	5.1. Usage of appropriate PPE 5.2. Usage and functions of appropriate materials, tools and equipment 5.3. DOLE-OSHS Rule 1210 – Electrical Safety 5.4. Pole setting methods 5.5. Rigging technique 5.6. Pole erection technique 5.7. Safe working load 5.8. Written, oral and hand signal communication	5.1. Communication skills 5.2. Interpretation skills 5.3. Mathematical skills 5.4. Rigging skills 5.5. Climbing skills 5.6. Skills in pole erection 5.7. Good housekeeping skills
6. Remove/ retrieve old pole	6.1. Appropriate tools, equipment and hardware are used in line with job requirement. 6.2. Personal protective equipment (PPE) are used following job requirements 6.3. ***Pole retrieval method*** is performed in line with job requirement 6.4. Housekeeping procedure is performed following company policies and procedures	6.1. Usage of appropriate PPE 6.2. Usage and functions of appropriate materials, tools and equipment 6.3. DOLE-OSHS Rule 1150 – Materials Handling and Storage 6.4. Rigging technique 6.5. Basic Math (MDAS) 6.6. Safe working load 6.7. Written and oral communication	6.1. Communication skills 6.2. Interpretation skills 6.3. Mathematical skills 6.4. Rigging skills 6.5. Climbing skills 6.6. Skills in operating chainsaw 6.7. Good housekeeping skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Occupational health and safety requirements	May include but not limited to: 1.1. Personal protective equipment (PPE) 1.1.1. Safety hat 1.1.2. Safety goggles 1.1.3. Safety gloves 1.1.4. Safety shoes 1.1.5. working clothes 1.2. Safety tools 1.2.1. Safety harness 1.2.2. climbing gears 1.3. Company health and safety policies and procedures 1.4. DOLE-OSHS Rule 1410 – Construction Safety 1.5. DOLE-OSHS Rule 1428 – Lines, Blocks, Rigging 1.6. DOLE-OSHS Rule 1210 – Electrical Safety 1.7. DOLE-OSHS Rule 1150 – Materials Handling and Storage 1.8. OHSAS 18001 – Occupational Health and Safety Management System 1.9. Philippine Grid Code
2. Transmission line tools, equipment and hardware	May include but not limited to: 2.1 Tools and equipment. 2.1.1 Rope 2.1.2 Load tongue pole 2.1.3 Sling 2.1.4 Snatch blocks 2.1.5 Auger bit 2.1.6 Climbing gear 2.1.7 Turning hook/cant hook 2.1.8 Digging tools 2.1.9 Adjustable wrench 2.1.10 Ballpeen hammer 2.1.11 Butting Board 2.1.12 Chainsaw 2.1.13 Load binder 2.1.14 Grounding cluster 2.1.15 Skinning knife 2.1.16 Adjustable Ladder (Fiber) 2.1.17 Vice grip 2.1.18 Stringing Block 2.1.19 Wire Grip 2.1.20 Straight shovel 2.1.21 Spoon Shovel 2.1.22 Digging Bar 2.1.23 Cable puller (Tirfur) 2.1.24 Wire Mesh/basket (with swivel eye) 2.1.25 Reel stand 2.1.26 Conductor turn table 2.1.27 Took Bucket

VARIABLE	RANGE
	2.1.28 Camera 2.1.29 Binocular 2.1.30 Hydraulic conductor cutter 2.1.31 Pole Trailer 2.1.32 Line truck 2.1.33 Motorized Winch 2.1.34 Boom truck 2.1.35 Crane 2.1.36 Motorized Splicing ,Machine 2.1.37 Power generator 2.1.38 Portable communication Radio 2.1.39 Cable height meter 2.1.40 Range finder 2.1.41 Voltage detector 2.1.42 Ratchet Hoist 2.1.43 Screw driver 2.1.44 Measuring device 2.2 Hardware 2.2.1 Machine bolts 2.2.2 Grounding wire 2.2.3 Staple wire 2.2.4 Pole 2.2.5 Anchor Screw 2.2.6 Anchor shackle 2.2.7 Angle brace 2.2.8 Angle support 2.2.9 Angle thimble eye 2.2.10 Ball Clevis 2.2.11 Parallel grove clamp 2.2.12 Strain clamp 2.2.13 Suspension clamp 2.2.14 Double arming bolt 2.2.15 double arming plate 2.2.16 Oval eye bolt 2.2.17 Guy hook 2.2.18 Eye nut 2.2.19 Long Bolt eye 2.2.20 Guy clamp 2.2.21 guy wire 2.2.22 porcelain insulator 2.2.23 Composite insulator 2.2.24 ACSR conductor 2.2.25 Cross arm steel/wood 2.2.26 Flat washer 2.2.27 X brace fitting
3. Loading& unloading method	May include but not limited to: 3.1 Mechanical (using boom truck) 3.2 Manual method

VARIABLE	RANGE
4. Loading and unloading safety requirements	May include but not limited to: 4.1 Rigging equipment to be used are inspected 4.2 Weight of the load is determined 4.3 Balance of the load is determined 4.4 Clearance and safety requirements is determined 4.5 Proper rigging equipment to be used is determined 4.6 Poles securely fastened 4.7 Early warning devices are available 4.8 Caution tape is available
5. Excavation procedure	May include but not limited to: 5.1 Stake location is determined. 5.2 Outline hole 5.3 Standard depth and width of pole hole requirements. 5.3.1 10% X length of pole plus 2 ft. 5.3.2 Butt diameter plus six (6) inches. 5.4 Dig trench requirements (Manual method erection) 5.4.1 3ft length, 3ft depth, width depends on pole butt diameter
6. Pole setting methods	May include but not limited to: 6.1 Boom truck 6.2 Piking 6.3 Gin pole 6.4 Bi-pod (Salagunting) 6.5 Helicopter
7. Pole retrieval methods	May include but not limited to: 7.1 Boomtruck 7.2 Gin pole

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Planned and prepared for work 1.2. Prepared hardware, transmission line tools and equipment 1.3. Performed pole staking and excavation 1.4. Performed pole loading and unloading, hauling and dragging 1.5. Performed pole-setting 1.6. Removed/retrieved old pole
2. Resource implications	The following resources should be available: 2.1. Tools, equipment and hardware 2.2. PPE and safety tools 2.3. Line truck
3. Method of assessment	3.1. Demonstration of skills with oral questioning 3.2. Written test 3.3. Portfolio assessment with Interview
4. Context of assessment	4.1. Competency maybe assessed in the workplace or in a simulated workplace setting 4.2. Assessment shall be undertaken either individually or part of team under limited supervision

UNIT OF COMPETENCY : PERFORM OVERHEAD TRANSMISSION LINE WORKS

UNIT CODE : UTL741305

DESCRIPTOR : This unit covers the knowledge, skills and attitude required in performing construction of overhead transmission line above 69 kV. This involves working with a team. The scope of this unit covers construction and maintenance of transmission line above 69 kV.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1. Work instruction is secured in accordance with ***job requirements*** 1.2. Relevant ***occupational health and safety requirements*** are identified following job specifications 1.3. Appropriate **transmission line *tools, equipment and hardware*** are identified and requested in accordance with job specifications	1.1. Applicable materials, tools and equipment 1.2. Usage of hand tools 1.3. Basic Math (MDAS) 1.4. Written and oral communication	1.1. Communication skills 1.2. Interpretation skills 1.3. Mathematical skills 1.4. Skills in identifying T/L hardware, tools and equipment
2. Prepare hardware, tools and equipment	2.1 Personal protective equipment (PPE) are obtained following job requirements 2.2 Appropriate tools, equipment and hardware are acquired and secured in line with job requirements 2.3 Functionality of tools and equipment is checked and tested in accordance with operational manual and company standards.	2.1 DOLE-OSHS Rule 1080 – Personal Protective Equipment and Devices 2.2 Usage and functions of appropriate materials, tools and equipment 2.3 OSH requirement 2.4 Basic Math (MDAs) 2.5 Written and oral communication	2.1 Communication skills 2.2 Interpretation skills 2.3 Mathematical skills 2.4 Skills in identifying T/L hardware, tools and equipment
3. Perform overhead maintenance works	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. Confirmation to proceed to work is secured from appropriate personnel in accordance with company procedures. 3.4. Line voltage detection is performed based on operational	3.1. Usage of appropriate PPE 3.2. Usage and functions of appropriate hardware, tools and equipment 3.3. Pole setting methods 3.4. Rigging technique 3.5. Pole erection technique 3.6. Structural Design and Specification 3.7. Armoring method	3.1. Communication skills 3.2. Interpretation skills 3.3. Mathematical skills 3.4. Pole erection skills 3.5. Rigging skills 3.6. Climbing skills 3.7. Conductor riding skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	manual and company procedures. 3.5. Grounding clusters are installed based on power industry safety practices 3.6. ***Conductor riding activities*** are performed based on job requirements. 3.7. ***Overhead maintenance work*** is performed according to job specifications 3.8. Housekeeping procedure is performed in line with power industry procedure	3.8. Load Principle 3.9. Simple Machine Principle 3.10. Basic Math (MDAS) 3.11. Safe working load 3.12. Written, oral and hand signal communication 3.13. Two-way radio communication 3.14. Clearance from DENR (cutting/ trimming permit) 3.15. DOLE-OSHS Rule 1080 – Personal Protective Equipment and Devices 3.16. DOLE-OSHS Rule 1210 – Electrical Safety 3.17. DOLE-OSHS Rule 1428 - Lines, Blocks, Rigging 3.1. Clean Air Act 3.18. 5S and 3Rs principles	

RANGE OF VARIABLES

VARIABLE	RANGE
1. Overhead maintenance job requirements	May include overhead maintenance job requirements for: 1.1 Guys and anchors 1.2 Pole dressing 1.2.1 Cross-arm and appurtenances 1.2.2 Insulators and appurtenances 1.3 Pole and cross arm 1.4 Tower lattices 1.5 Insulators. 1.6 Conductor, OHGW and appurtenances 1.6.1. Conductor splicing 1.6.2. Armoring/Vibration damper 1.6.3. Conductor spacer 1.6.4. quadruple yoke 1.6.5. repair sleeve
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. Working clothes 2.2 Safety tools 2.3 Safety harness 2.4 Fall arrest 2.5 Climber set 2.6 Voltage detection of de-energized line (with voltage detector) 2.7 Installation of grounding clusters 2.8 DOLE-OSHS Rule 1210 – Electrical Safety 2.9 DOLE-OSHS Rule 1420 - Logging 2.10 DOLE-OSHS Rule 1150 – Materials Handling and Storage 2.11 OHSAS 18001 – Occupational Health and Safety Management System
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 3.2 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 bolt cutter

VARIABLE	RANGE
	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 o Lattices o Step bolts o Bolts and nuts o Plates and back plates o Grounding cables o Tower fitting o Arcing horn o Tower fitting
4. Conductor riding activities	May include but not limited to: 4.1 Install/replace vibration damper 4.2 Install wire grip 4.3 Install by-pass jumper 4.4 Repair damaged conductor 4.5 Install/replace line spacer 4.6 Replacement of insulator 4.7 Replacement of damaged strain clamp 4.8 Conductor/OHGW sag correction 4.9 Removal of foreign objects 4.10 Cleaning of insulators
5. Overhead maintenance works	Overhead maintenance works may include: 5.1 Replacement/ installation of Guys and anchors 5.2 Pole dressing 5.2.1. Cross-arm and appurtenances 5.2.2. Insulators and appurtenances 5.3 Replacement of rotten pole and cross- arm 5.4 Replacement of defective/missing tower lattices 5.5 Replacement of damaged/corroded insulators. 5.6 Replacement of damaged Conductor, OHGW and appurtenances 4.6.1. Conductor splicing 4.6.2. Armoring/Vibration damper 4.6.3. Conductor spacer 4.6.4. quadruple yoke 5.7 Installation of repair sleeve

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Planned and prepared for work 1.2. Prepared hardware, tools and equipment 1.3. Performed line voltage detection 1.4. Installed grounding clusters 1.5. Performed conductor riding activity 1.6. Performed overhead maintenance works
2. Resource implications	The following resources should be available: 2.1. Tools, equipment, hardware and PPE (see range of variables) 2.2. Work area 2.3. Line truck
3. Method of assessment	3.1. Direct observation with oral questioning 3.2. Demonstration with oral questioning 3.3. Written test 3.4. Portfolio assessment with interview
4. Context of assessment	4.1. Competency maybe assessed in the workplace or in a simulated workplace setting 4.2. Assessment shall be undertaken either individually or part of team under limited supervision

UNIT OF COMPETENCY : INSTALL EMERGENCY RESTORATION STRUCTURE (ERS)

UNIT CODE : UTL741306

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

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for ERS work	1.1. Work instruction is secured and interpreted according to ***job requirements*** 1.2. Appropriate ***occupational health and safety requirements*** are identified following job specifications 1.3. Appropriate ERS ***tools, equipment and hardware*** are identified and requested in accordance with job specifications	1.1. DOLE-OSHS Rule 1080 – Personal Protective Equipment and Devices 1.2. Usage and function of appropriate ERS tools, equipment and hardware 1.3. OSH requirements 1.4. Simple machine principles 1.5. Basic math (MDAS) 1.6. Written and oral communication	1.1. Communication skills 1.2. Interpretation skills 1.3. Mathematical skills 1.4. Skills in identifying ERS hardware, tools and equipment
2. Prepare ERS hardware, tools and equipment	2.1. Personal protective equipment (PPE) are obtained following job requirements 2.2. Appropriate occupational health and safety requirements are identified following job specifications 2.3. ERS tools, equipment and hardware are secured in line with job requirements.	2.1. Usage of appropriate PPE 2.2. Usage and functions of appropriate ERS hardware's, tools and equipment 2.3. OSH requirements 2.4. DOLE-OSHS Rule 1150 – Materials Handling and Storage 2.5. Basic math (MDAS) 2.6. Written and oral communication	2.1. Communication skills 2.2. Interpretation skills 2.3. Mathematical skills 2.4. Skills in identifying ERS hardware, tools and equipment
3. Load and haul ERS components	3.1. ERS tools, equipment and hardware are used in line with job requirements 3.2. Personal protective equipment (PPE) are used following job requirements 3.3. Proper loading and unloading of ERS components is performed.	3.1. Usage of appropriate PPE 3.2. Usage and functions of appropriate ERS hardware's, tools and equipment 3.3. DOLE-OSHS Rule 1428 - Lines, Blocks, Rigging 3.4. Handling and hauling of ERS components 3.5. OSH requirements 3.6. Rigging technique 3.7. Simple machine principle 3.8. Written and oral communication	3.1. Communication skills 3.2. Interpretation skills 3.3. Mathematical skills 3.4. Skills in rigging technique 3.5. Skills in identifying ERS hardware, tools and equipment

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Perform staking and anchor rod installation	4.1. Personal protective equipment (PPE) are used following job requirements 4.2. ERS tools, equipment and hardware are used in line with job requirements 4.3. ERS location including anchor rod staking procedure is performed in line with the manufacturer's designed data. 4.4. Anchor rod is installed based on manufacturer's designed data.	4.1. Usage of appropriate PPE 4.2. Usage and function of appropriate ERS materials, tools and equipment 4.3. DOLE-OSHS Rule 1210 – Electrical Safety 4.4. Interpretation of procedures in anchor rod staking 4.5. HPU, jackhammer and load locker operation 4.6. Manta ray plate installation procedure 4.7. Simple machine principles 4.8. Written and oral communication	4.1. Communication skills 4.2. Interpretation skills 4.3. Mathematical skills 4.4. Skills in identifying ERS hardware, tools and equipment 4.5. Skills in anchor rod staking 4.6. Skills in HPU, jackhammer and load locker operation 4.7. Skills in proper installation and positioning Manta ray plate
5. Erect and dismantle ERS	5.1 Transmission line tools, equipment and hardware are used in line with job requirements 5.2 Personal protective equipment (PPE) are used following job requirements 5.3 ERS erection and dismantling activity is performed in line with job requirements 5.4 Housekeeping procedure is performed in line with company procedure and standards	5.1 Usage of appropriate PPE 5.2 Usage and function of ERS hardware's, tools and equipment. 5.3 DOLE-OSHS Rule 1428 - Lines, Blocks, Rigging 5.4 Rigging technique 5.5 Simple machine principles 5.6 Safe working load 5.7 Safe working clearance 5.8 Written and oral communication	5.1 Communication skills 5.2 Interpretation skills 5.3 Mathematical skills 5.4 Climbing skills 5.5 Rigging skills 5.6 Skills in identifying ERS hardware, tools and equipment 5.7 Skills in operation of ERS special tools and equipment 5.8 Skills in ERS erection and dismantling
6. Install ERS components	6.1 ERS components are identified and secured based on ***manufacturer's design data*** and job requirement. 6.2 ERS components are installed based on manufacturer's design data and job requirement. 6.3 Housekeeping procedure is performed in line with	6.1 Usage of appropriate PPE 6.2 DOLE-OSHS Rule 1210 – Electrical Safety 6.3 Usage and function of ERS hardware's, tools and equipment. 6.4 DOLE-OSHS Rule 1428 - Lines, Blocks, Rigging	6.1 Communication skills 6.2 Interpretation skills 6.3 Mathematical skills 6.4 Climbing skills 6.5 Rigging skills 6.6 Skills in identifying ERS

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	company procedure and standards	6.5 Rigging technique 6.6 Simple machine principles 6.7 DOLE-OSHS Rule 1410 – Construction Safety 6.8 Math: 6.8.1 Safe working load 6.8.2 Safe working clearance 6.9 Written and oral communication	hardware, tools and equipment 6.7 Skills in operation of ERS special tools and equipment 6.8 Skills in ERS erection and dismantling

RANGE OF VARIABLES

VARIABLE	RANGE
1. ERS job requirements	May include but not limited to: 1.1. Toppled tower structure 1.2. Damaged structure 1.3. Intermediary structure 1.4. By-pass 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. Working clothes 2.2. Safety tools 2.2.1. Safety harness 2.2.2. Safety belt 2.3. Installation of grounding cluster 2.4. DOLE-OSHS Rule 1210 – Electrical Safety 2.5. DOLE-OSHS Rule 1428 - Lines, Blocks, Rigging 2.6. DOLE-OSHS Rule 1410 – Construction Safety 2.7. DOLE-OSHS Rule 1150 – Materials Handling and Storage
3. ERS and 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. Plumb bob 3.1.9. Utility platform 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. HPU 3.2.7. Jack hammer 3.2.8. Motorized winch 3.3. Hardware 3.3.1. Anchor shackle 3.3.2. Bolts and nuts 3.3.3. Anchor rod/manta ray

VARIABLE	RANGE
	3.3.4. Guy wires 3.3.5. Guy grips pre formed 3.3.6. Post insulator 3.3.7. Post insulator bracket 3.3.8. Polymer 3.4. Set of ERS (Basic Components) 3.4.1. Foundation base plate 3.4.2. Mast/column section 3.4.3. Gimbal joint/ articulated base 3.4.4. Guy plate 3.4.5. Swivel guy plate 3.4.6. Box section (Lindsey)
4. Manufacturer's design data	May include but not limited to: 4.1 Lindsey 1070/600 4.2 SBB

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Planned and prepared for work 1.2. Prepared ERS hardware, tools and equipment 1.3. Performed loading and hauling of ERS components 1.4. Performed staking and anchor rod installation 1.5. Performed ERS erection and dismantling 1.6. Installed ERS components
2. Resource Implications	The following resources must be available: 2.1. Transmission line tools, equipment and hardware 2.2. PPE and safety tools 2.3. Work area 2.4. Line truck
3. Method of assessment	3.1. Observation and Oral questioning 3.2. Demonstration with oral questioning 3.3. Written test 3.4. Portfolio assessment with interview
4. Context of assessment	4.1. Competency may be assessed in the workplace or in a simulated workplace setting 4.2. Assessment shall be undertaken either individually or part of team under limited supervision

UNIT OF COMPETENCY : PERFORM EARTH/GROUND RESISTANCE TESTING
UNIT CODE : UTL741307
UNIT DESCRIPTOR : This unit describes the knowledge, skills and attitudes in proper using of earth/ground resistance tester in transmission line resistance testing. This unit will involve working in a team environment.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1. Work instruction is secured according to job requirements 1.2. Relevant ***occupational health and safety requirements*** are identified following job specifications 1.3. Relevant transmission line ***tools and equipment*** are identified and requested in accordance with job specifications	1.1. Usage and functions of ground resistance Tester 1.2. Usage of hand tools 1.3. Types and usage PPE 1.4. Rod distance measurement 1.5. Basic math (MDAS) 1.6. Written and oral communication	1.1. Communication skills 1.2. Interpretation skills 1.3. Mathematical skills
2. Prepare tools and equipment	2.1. Personal protective equipment (PPE) are obtained following job requirements. 2.2. Transmission line tools and equipment are secured in line with job requirements 2.3. Earth resistance tester's condition and functionality are checked based on manufacturer's equipment manual.	2.1. DOLE-OSHS Rule 1080 – Personal Protective Equipment and Devices 2.2. Operation of earth resistance tester 2.3. Usage of hand tools 2.4. Basic math (MDAS) 2.5. Written and oral communication	2.1. Communication skills 2.2. Interpretation skills 2.3. Mathematical skills
3. Conduct earth/ground testing	3.1. Test rod location is identified based on equipment instructional manual. 3.2. Test rod is driven on identified ground location based equipment instructional manual. 3.3. Lead wires are laid out in accordance with earth/ground procedures. 3.4. Wire contact connections are firmly connected with the test and tower body. 3.5. Tester reading is recorded based on testing procedures. 3.6. Test result is submitted to ***concerned personnel*** in accordance with company procedures.	3.1. Usage of appropriate PPE 3.2. Procedures in earth/ground testing 3.3. Operation of earth/ground resistance tester 3.4. Earth/ ground resistance principle 3.5. DOLE-OSHS Rules 1210 – Electrical Safety 3.6. Basic math(MDAS) 3.7. Written and oral communication	3.1. Communication skills 3.2. Interpretation skills 3.3. Mathematical skills 3.4. Testing reading skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Occupational health and safety standards	May include but not limited to: 1.1 Personal protective equipment (PPE) 1.1.1 Safety hat 1.1.2 Safety goggles 1.1.3 Safety gloves 1.1.4 Safety shoes /rain boots 1.2 DOLE-OSHS Rules 1210 – Electrical Safety 1.3 DOLE-OSHS Rule 1080 – Personal Protective Equipment and Devices
2. Tools and equipment	May include but not limited to: 2.1 Hand tools 2.1.1 Pliers 2.1.2 Screwdrivers 2.1.3 Adjustable wrenches 2.1.4 Ball peen hammer 2.1.5 Hacksaw/cutting tools 2.1.6 Bolo 2.1.7 Steel brush or sand paper 2.1.8 Tape measure 2.2 Equipment 2.2.1 Line truck 2.2.2 Ground resistance Tester with extra battery
3. Concerned personnel	May include: 3.1 line foreman 3.2 line engineer 3.3 OPC personnel

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Planned and prepared for work 1.2. Prepared tools and equipment 1.3. Conducted earth/ground testing
2. Resource Implications	The following resources must be available: 2.1. Earth/ground testing tools, equipment and PPE 2.2. Assessment area 2.3. Line truck/service vehicle
3. Method of assessment	3.1. Demonstration with oral questioning 3.2. Interview 3.3. Written test 3.4. Portfolio assessment with interview
4. Context of assessment	4.1. Competency may be assessed in the workplace or in a simulated workplace setting

ELECTIVE COMPETENCIES

UNIT OF COMPETENCY : PERFORM HOTLINE MAINTENANCE WORK

UNIT CODE : UTL741308

DESCRIPTOR : This unit covers the knowledge, skills and attitude to perform hotline maintenance on any existing transmission line using both hot sticks method and bare hand method. This unit will involve working in a team environment.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for hotline work	1.1. Work instruction is secured according to ***job requirements.*** 1.2. Appropriate ***occupational health and safety requirements*** are identified following job specifications 1.3. Appropriate ***hotline tools, equipment and line hardware*** are identified and requested in accordance with the job specifications	1.1. DOLE-OSHS Rule 1080 – Personal Protective Equipment and Devices 1.2. Usage and function of appropriate hotline tools and equipment 1.3. Basic Math (MDAS) 1.4. Safe working load and clearance 1.5. Written and oral communication	1.1. Communication skills 1.2. Interpretation skills 1.3. Mathematical skills 1.4. Skills in identifying hotline tools, equipment and line hardware
2. Prepare hotline and transmission line tools, equipment and line hardware	2.1. Personal protective equipment (PPE) are obtained following job requirements 2.2. Hotline, tools, equipment and line hardware are acquired and secured in line with job requirements 2.5 Cleaning and testing of insulated hot-sticks and ladder are performed based on manufacturer's standards	3.1. DOLE-OSHS Rules 1210 – Electrical Safety 2.1. Usage of appropriate PPE 2.2. Appropriate hotline materials, tools and equipment 2.3. Proper handling of hotline materials, tools and equipment. 2.4. Simple machine principle 2.5. Written and oral communication	2.1. Communication skills 2.2. Interpretation skills 2.3. Mathematical skills 2.4. Skills in identifying hotline hardware, tools and equipment

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Perform hotline maintenance procedure	3.1. Hotline tools equipment and line hardware are used in line with job requirements 3.2. Personal protective equipment (PPE) are used following job safety requirements 3.3. Approved caution tag is verified/confirmed based on company policies and standards 3.4. Hotline ***maintenance work*** is performed based on job requirements and company policies and standards. 3.5. Housekeeping procedure is performed in line with company procedures and standards	3.2. Usage of appropriate PPE 3.3. Usage and function of appropriate hotline materials, tools and equipment 3.4. Application for hot-stick and/or bare-hand methods 3.5. Usage of hot-sticks, hotline accessories and hand tools 3.6. Safe rigging technique and company requirements 3.7. Hotline tools and 3.8. DOLE-OSHS Rule 1210 – Electrical Safety 3.9. DOLE-OSHS Rule 1410 – Construction Safety 3.10. Equipment specifications 3.11. OSH requirements 3.12. Basic electricity 3.13. Safe working clearances 3.14. Safe working load 3.15. Written and oral communication 3.16. Clean Air Act 3.17. 5S and 3Rs principles	3.1. Communication skills 3.2. Interpretation skills 3.3. Mathematical skills 3.4. Climbing Skills 3.5. Rigging skills based on safe working procedures 3.6. Skills in identifying hotline tools, hardware and equipment.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hotline maintenance job requirements	May include but not limited to: 1.1. Hotstick 1.1.1. Wood pole 1.1.2. Cross arm 1.1.3. Insulator 1.2. Barehand 1.2.1. Armor rod 1.2.2. Conductor 1.2.3. Vibration damper 1.2.4. Strain clamp 1.2.5. Suspension clamp
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 (without steel toe) 2.1.5. Safety harness/strap 2.2. Conductive suit, gloves, socks and static belt 2.3. Conductive boots
3. Transmission line and hotline 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. Hotline tools and equipment 3.3.1. Nylon strap ratchet hoist 3.3.2. hoist link stick 3.3.3. hotline wire grip 3.3.4. Capstan hoist 3.3.5. Polydacron rope 3.3.6. Nylon webbing sling 3.3.7. Tool bucket 3.3.8. Glass fiber filled nylon rope block, single sheave 3.3.9. Glass fiber filled nylon rope block, double sheave

VARIABLE	RANGE
	3.3.10. Glass fiber filled nylon rope block, double sheave 3.3.11. Snatch block 3.3.12. Hand line hook 3.3.13. Cant hook 3.3.14. Tele height 3.3.15. Grip all clamp stick 3.3.16. Wire holding stick 3.3.17. Disconnect stick 3.3.18. All angle cog wrench 3.3.19. Tie stick 3.3.20. Flexible insulated wrench 3.3.21. Flexible wrench head 3.3.22. Hydraulically operated conductor cutter 3.3.23. Insulated handle for hand tools 3.3.24. Universal pole 3.3.25. Cross arm hanger 3.3.26. Wire tong 3.3.27. Wire tong saddle clevis 3.4. Hotline Universal tools accessories 3.4.1. Pin holder 3.4.2. Ratchet wrench 3.4.3. Chuck blank 3.4.4. Snap out cotter key remover 3.4.5. Snap out disconnect 3.4.6. Locating pin 3.4.7. Cotter key installing tool 3.4.8. Cotter key pusher 3.4.9. Ball socket adjuster 3.4.10. Pruning saw 3.4.11. Screw driver 3.4.12. Shepherd hook 3.4.13. Fixed blade tie stick head 3.4.14. Pistol grip saw handle 3.4.15. Adjustable insulator fork 3.4.16. Rotary prong tie stick head 3.4.17. Rotary blade tie stick head 3.4.18. Fuse puller 3.4.19. Universal adapter 3.4.20. Cotter key puller 3.4.21. Tool for W keys 3.4.22. Clevis pin installer 3.4.23. Cotter key holder 3.4.24. Cotter key tool 3.4.25. Plastic insulator tool 3.4.26. All angle pliers 3.4.27. Utility head

VARIABLE	RANGE
	3.5. Hotline conductor support and tension tools 3.5.1. Wire tong pole clevis 3.5.2. Wire tong band 3.5.3. Wire tong block clamps 3.5.4. Wire tong swivel 3.5.5. Saddle and lightener clamp 3.5.6. Extension chain 3.5.7. Wheel lightener assembly 3.5.8. Cross arm type saddle 3.5.9. Tower type saddle 3.5.10. Single type lever lift 3.5.11. Arbor adapter 3.5.12. Double type lever lift 3.5.13. Spiral link stick 3.5.14. Roller link stick 3.5.15. Hot stick tension puller 3.5.16. Adjustable strain pole 3.5.17. Two pole strain carrier 3.5.18. Distribution strain carrier 3.5.19. Structure yoke assembly 3.5.20. Conductor yoke assembly 3.5.21. Dead end compression yoke assembly 3.5.22. Take-up trunion 3.5.23. Compression sleeve fittings for alcoa cast bodies 3.5.24. Dead end socket 3.5.25. Bolted adapter 3.5.26. Adjustable pole clamp 3.5.27. Single strain pole carrier yoke 3.5.28. Dead end jack 3.5.29. Strain pole 3.5.30. Ratchet wrench for take-up trunion 3.5.31. Strain jack 3.5.32. Transmission insulator cradle 3.5.33. EHV side- opening insulator cradle 3.5.34. EHV trough-Design insulator cradle 3.5.35. Insulator retaining plate 3.5.36. Static ground 3.5.37. J-hook assembly 3.5.38. Suspension insulator tools 3.5.39. Hot end-End suspension yokes 3.5.40. Adjustable hook assembly 3.5.41. Tower arm yoke 3.5.42. H-Frame yoke 3.5.43. Fork suspension tool attachment 3.5.44. Tandem trolley

VARIABLE	RANGE
	3.6. Insulated Gin and Booms 3.6.1. Boom mast bridle 3.6.2. Swivel boom –heavy duty 3.6.3. Swivel boom-medium duty 3.7. Jumper equipment and load-pickup tools 3.7.1. Load-pickup tool jumper cable 3.7.2. 34.5 kV by-[ass jumper 3.7.3. Jumper support cable 3.8. Insulated Ladders and Platforms 3.8.1. Epoxy spliced ladder 3.9. Ladder support attachment 3.9.1. Ladder support assembly for vertical tower member 3.9.2. Ladder support assembly for horizontal tower member 3.9.3. Yoke assembly 3.9.4. Vertical ladder support attachment for wood poles 3.9.5. Spreader bar 3.9.6. Double clamp 3.9.7. Ladder clamp 3.9.8. Swivel sticks 3.9.9. Adjustable hook ladder 3.9.10. Ladder monitoring kit 3.9.11. Epoxy glass platform 3.9.12. Platform ladder 3.9.13. Platform mounting attachment 3.9.14. Pivot base 3.9.15. Pole cover 3.9.16. Cross arm cover 3.9.17. Conductor and insulator cover 3.9.18. Short lip flexible hose 3.9.19. Epoxy glass cleaning kit 3.9.20. Moisture eater 3.9.21. Abrasive cleaning pads 3.9.22. Gloss restorer kit 3.9.23. Hot-stick wiping cloths 3.9.24. Hot sick tester 3.9.25. Epoxy-glass bond patching kit 3.9.26. Epoxy sand kit 3.9.27. Epoxy-glass plug kit 3.9.28. Tool lubricant 3.9.29. Safety hand guard 3.9.30. Tool hangers 3.9.31. Hotline tool rack 3.9.32. Hot-stick storage tubes 3.9.33. Fiber-glass trailer

VARIABLE	RANGE
	3.10. Hardware 3.10.1. Insulator 3.10.2. Machine bolts 3.10.3. Suspension clamp assembly (ACSR/OHGW) 3.10.4. Strain clamp assembly(ACSR/OHGW) 3.10.5. Overhead ground wires 3.10.6. Cross-arms and braces 3.10.7. Conductors and accessories
4. Hotline maintenance works.	4.1. Hot stick method 4.1.1. Replacement of rotten wood pole 4.1.2. Replacement of rotten cross arm 4.1.3. Replacement of broken/corroded insulator 4.2. Bare hand method 4.2.1. Replacement of broken/corroded insulator 4.2.2. Repair of armor rod 4.2.3. Repair of damaged conductor 4.2.4. Installation of vibration damper 4.2.5. Replacement of suspension clamp 4.2.6. Replacement of strain clamp

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Planned and prepared for work 1.2. Prepared hotline and transmission line tools, equipment and line hardware 1.3. Performed hotline maintenance work
2. Resource Implications	The following resources should be provided: 2.1. Hotline tools, equipment and hardware 2.2. PPE and safety tools 2.3. Work area 2.4. Line truck/trailer/container van
3. Method of assessment	Competency in this unit may be assessed through: 3.1. Observation with oral questioning 3.2. Demonstration with oral questioning 3.3. Written test 3.4. Portfolio assessment with interview
4. Context of assessment	4.1. Competency may be assessed in the workplace or in a simulated workplace setting 4.2. Assessment shall be undertaken either individually or part of team under limited supervision

SECTION 3 TRAINING ARRANGEMENTS

This set of standards provides Technical and Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for Transmission Line Installation and Maintenance NC III.

This includes information on curriculum design; training delivery; trainee entry requirements; tools and equipment; training facilities; and trainer's qualification and institutional assessment.

3.1 CURRICULUM DESIGN

TESDA shall provide the training on the development of competency-based curricula to enable training providers develop their own curricula with the components mentioned below.

Delivery of knowledge requirements for the basic, common and core units of competency specifically in the areas of mathematics, science/technology, communication/language and other academic subjects shall be contextualized. To this end, TVET providers shall develop a Contextual Learning Matrix (CLM) to accompany their curricula.

Course Title: Transmission Line Installation and Maintenance **NC Level:** NC III

Nominal Training Duration:
32 hrs – Basic Competencies
60 hrs – Common Competencies
116 hrs – Core Competencies
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208 hrs - Total

Nominal Training Duration (Elective):
150 hrs - Elective 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 installation/construction of new transmission line structures, performance of overhead transmission line works, installation of emergency restoration structure (ERS) and performance of earth/ground resistance testing. This course also includes competency in performance of hotline maintenance works as an elective unit.

The nominal duration of 208 hours covers the required units at Transmission Line Installation and Maintenance NC III. TVET providers can however, offer a longer, ladderized course covering the NC III basic, common and core units.

A nominal training duration of 150 hours for the elective unit - "Perform hotline maintenance works", is included for additional competency.

BASIC COMPETENCIES

32 hrs

UNIT OF COMPETENCY	LEARNING OUTCOMES	LEARNING ACTIVITIES	METHODOLOGY	ASSESSMENT APPROACH	NOMINAL DURATION
1. Lead workplace communication	1.1. Communicate information about workplace processes	1.1.1. Read o Effective verbal communication methods o Sources of information 1.1.2. Practice organizing information 1.1.3. Identify organization requirements for written and electronic communication methods 1.1.4. Follow organization requirements for the use of written and electronic communication methods 1.1.5. Perform exercises on understanding and conveying intended meaning scenario	1.1.1. Lecture 1.1.2. Demonstration 1.1.3. Practical exercises 1.1.4. Role Play	1.1.1. Written Test 1.1.2. Observation	2 Hours
	1.2. Lead workplace discussions	1.2.1. Discuss organizational policy on production, quality and safety o Goals/ objectives and action plan setting 1.2.2. Read effective verbal communication methods 1.2.3. Prepare/set action plans based on organizational goals and objectives	1.2.1. Group discussion 1.2.2. Lecture 1.2.3. Demonstration	1.2.1. Oral evaluation 1.2.2. Written Test 1.2.3. Observation	2 Hours
	1.3. Identify and communicate issues arising in the workplace	1.3.1. Discuss organizational policy in dealing with issues and problems 1.3.2. Read effective verbal communication methods 1.3.3. Practice organizing information 1.3.4. Perform exercises on understanding and conveying intended meaning scenario	1.3.1. Group discussion 1.3.2. Lecture 1.3.3. Demonstration 1.3.4. Role Play	1.3.1. Oral evaluation 1.3.2. Written Test 1.3.3. Observation	2 Hours
2. Lead small team	2.3. Provide team leadership	2.3.1. Discuss company policies and procedures 2.3.2. Identify client expectations	2.3.1. Group discussion 2.3.2. Lecture	2.3.1. Oral evaluation	2 Hours

UNIT OF COMPETENCY	LEARNING OUTCOMES	LEARNING ACTIVITIES	METHODOLOGY	ASSESSMENT APPROACH	NOMINAL DURATION
		2.3.3. Practice team building skills 2.3.4. Perform exercises on communication skills required for leading teams	2.3.3. Demonstration 2.3.4. Role Play	2.3.2. Written examination 2.3.3. Observation	
	2.4. Assign responsibilities	2.4.1. Discuss: o Team member's duties and responsibilities 2.4.2. Identify client expectations 2.4.3. Practice negotiating skills 2.4.4. Perform group exercises showing the skills and techniques in promoting team building	2.4.1. Group discussion 2.4.2. Lecture 2.4.3. Demonstration 2.4.4. Role Play	2.4.1. Oral evaluation 2.4.2. Written examination 2.4.3. Observation	2 Hours
	2.5. Set performance expectations for team members	2.5.1. Discuss: o Team member's duties and responsibilities o How performance expectations are set 2.5.2. Identify client expectations 2.5.3. Perform group exercises in setting individual target/ expectation 2.5.4. Read instruction and requirements in up to date dissemination to members	2.5.1. Group discussion 2.5.2. Lecture 2.5.3. Demonstration 2.5.4. Role Play 2.5.5. Lecture	2.5.1. Oral evaluation 2.5.2. Written examination 2.5.3. Observation	1 Hour
	2.6. Supervise team performance	2.6.1. Describe listening and treating individual team members concern 2.6.2. Identify methods of Monitoring Performance 2.6.3. Perform group exercises showing the skills in monitoring team performance	2.6.1. Group discussion 2.6.2. Lecture 2.6.3. Demonstration	2.6.1. Oral evaluation 2.6.2. Written examination 2.6.3. Observation	1 Hour

UNIT OF COMPETENCY	LEARNING OUTCOMES	LEARNING ACTIVITIES	METHODOLOGY	ASSESSMENT APPROACH	NOMINAL DURATION
3. Develop and practice negotiation skills	3.1. Identify relevant information in planning negotiations	3.1.1. Discuss codes of practice and guidelines for the organization 3.1.2. Discuss differences between content and process 3.1.3. Read: o Organizations policy and procedures for negotiations o Decision making and conflict resolution strategies procedures o Strategies to manage conflict o Steps in negotiating process 3.1.4. Identify bargaining information 3.1.5. Apply strategies to manage process 3.1.6. Apply steps in negotiating process	3.1.1. Group Discussion 3.1.2. Lecture 3.1.3. Demonstration	3.1.1. Oral evaluation 3.1.2. Written examination 3.1.3. Observation	2 hours
	3.2. Participate in negotiations	3.2.1. Describe the following strategies during negotiation: o Decision making and conflict resolution strategies procedures o Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation 3.2.2. Practice the following scenarios in a group activity: o Perform interpersonal skills to develop rapport with other parties o Perform verbal communication and listening skill o observation skills o negotiation skills	3.2.1. Group Discussion 3.2.2. Case studies 3.2.3. Demonstration 3.2.4. Simulation/ Role play	3.2.1. Oral evaluation 3.2.2. Observation	2 Hours
	3.3. Document areas for agreement	3.3.1. Discuss the procedure in documenting negotiations 3.3.2. Apply a filing system in managing information 3.3.3. Demonstrate filing of documents	3.3.1. Group Discussion 3.3.2. Simulation/ Role play 3.3.3. Demonstration	3.3.1. Oral evaluation 3.3.2. Observation	1 Hour

UNIT OF COMPETENCY	LEARNING OUTCOMES	LEARNING ACTIVITIES	METHODOLOGY	ASSESSMENT APPROACH	NOMINAL DURATION
4. Solve Workplace problems related to work activities	4.1. Identify the problem	4.1.1. Discuss Normal operating parameters & product quality 4.1.2. Identify & clarify the nature of problem 4.1.3. Read: o Brainstorming o Cause and effect diagrams o PARETO analysis o SWOT analysis o GANT chart o PERT CPM & graph o SCATTERGRAMS 4.1.4. Apply observation, investigation and analytical techniques in solving problem in the workplace	4.1.1. Group discussion 4.1.2. Lecture 4.1.3. Demonstration	4.1.1. Oral evaluation 4.1.2. Written examination 4.1.3. Observation	2 Hours
	4.2. Determine fundamental cause of the problem	4.2.1. Discuss Teamwork and work allocation problem 4.2.2. Read: o Using range of formal problem solving techniques o Enterprise goals, targets and measures o Enterprise quality, OHS and environmental requirement o Non-routine process and quality problems 4.2.3. Perform group exercises showing safety in emergency situations and incidents 4.2.4. Identify & clarify the nature of problem 4.2.5. Select relevant equipment and operational processes	4.2.1. Group discussion 4.2.2. Lecture 4.2.3. Demonstration 4.2.4. Role Play	4.2.1. Oral evaluation 4.2.2. Written examination 4.2.3. Observation	1 Hour
	4.3. Determine correct / preventive action	4.3.1. Discuss principles of decision making strategies and techniques 4.3.2. Read: o Evaluating the solution o Devising the best solution	4.3.1. Group Discussion 4.3.2. Lecture 4.3.3. Demonstration 4.3.4. Role Play	4.3.1. Oral evaluation 4.3.2. Written examination 4.3.3. Observation	1 Hour

UNIT OF COMPETENCY	LEARNING OUTCOMES	LEARNING ACTIVITIES	METHODOLOGY	ASSESSMENT APPROACH	NOMINAL DURATION
		4.3.3. Perform group exercise how to implement the developed plan to rectify a problem			
	4.4. Provide recommendation to manager	4.4.1. Discuss industry codes and standards 4.4.2. Apply enterprise information systems and data collation 4.4.3. Prepare recommendation letter	4.4.1. Group Discussion 4.4.2. Demonstration	4.4.1. Oral evaluation 4.4.2. Observation	1 Hour
5. Use mathematical concepts and techniques	5.4. Identify mathematical tools and techniques to solve problems	5.4.1. Discuss the four fundamental operation (addition, subtraction, division, multiplication) 5.4.2. Read: o Measurement system o Precision and accuracy o Basic measuring tools/devices 5.4.3. Apply mathematical computations 5.4.4. Demonstrate activities on: o Use of calculator o Use of different measuring tools	5.4.1. Group Discussion 5.4.2. Lecture 5.4.3. Demonstration	5.4.1. Oral evaluation 5.4.2. Written examination 5.4.3. Observation	1 Hour
	5.5. Apply mathematical procedures / solution	5.5.1. Read: o Estimation o Problem-based questions o Mathematical techniques 5.5.2. Apply mathematical computations 5.5.3. Demonstrate activities on: o Use of calculator o Use of different measuring tools o Use of mathematical tools and standard formulas	5.5.1. Lecture 5.5.2. Demonstration 5.5.3. Simulation/ Role play	5.5.1. Written examination 5.5.2. Observation	2 Hours
	5.6. Analyze results	5.6.1. Discuss the four fundamental operation (addition, subtraction, division, multiplication) 5.6.2. Read: o Measurement system o Precision and accuracy o Basic measuring tools/devices	5.6.5. Group Discussion 5.6.1. Lecture 5.6.2. Demonstration	5.6.3. Oral evaluation 5.6.1. Written examination 5.6.2. Observation	2 Hours

UNIT OF COMPETENCY	LEARNING OUTCOMES	LEARNING ACTIVITIES	METHODOLOGY	ASSESSMENT APPROACH	NOMINAL DURATION
		5.6.3. Apply mathematical computations 5.6.4. Demonstrate activities on: o Use of calculator o Use of different measuring tools			
6. Use relevant technologies	6.1. Identify appropriate technology	6.1.1. Discuss company policy in relation to relevant technology 6.1.2. Read: o Awareness on technology and its function o Relevant technology application/ implementation o Operating instructions 6.1.3. Practice basic communication skill in a group activity	6.1.1. Group Discussion 6.1.2. Lecture 6.1.3. Demonstration 6.1.4. Simulation/ Role Play	6.1.1. Oral evaluation 6.1.2. Written examination 6.1.3. Observation	1 Hour
	6.2. Apply relevant technology	6.2.1. Discuss different management concepts 6.2.2. Read: o Relevant technology application/ implementation o Technology adaptability o Different management concepts o Health and safety procedure o Communication techniques 6.2.3. Apply software applications skills 6.2.4. Practice drills on installing application software 6.2.5. Practice basic communication skill in a group activity	6.2.1. Group Discussion 6.2.2. Lecture 6.2.3. Demonstration 6.2.4. Simulation/ Role Play	6.2.1. Oral evaluation 6.2.2. Written examination 6.2.3. Observation	2 Hours
	6.3. Maintain / enhance relevant technology	6.3.1. Read: o Repair and maintenance procedure o Operating instructions 6.3.2. Practice drills: o Installing application software o Basic troubleshooting skills	6.3.1. Lecture 6.3.2. Demonstration 6.3.3. Simulation/ Role Play	6.3.1. Written examination 6.3.2. Observation	2 Hours

Note: Basic competencies may be embedded in the core competencies.

COMMON COMPETENCIES

(60 hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Apply Quality Standards	1.1 Assess quality of received materials	1.1.1 Identify relevant production processes, materials and products 1.1.2 Study and interpret characteristics of materials, software and hardware used in production processes 1.1.3 Perform quality checking procedures 1.1.4 Apply quality Workplace procedures 1.1.5 Identify faulty materials 1.1.6 Check quality of materials or component parts as per manufacturer's standards 1.1.7 Interpret specifications or symbols	1.1.1 Lecture 1.1.2 Field trip 1.1.3 Symposium 1.1.4 Video clips 1.1.5 Simulation/ Role playing	1.1.1 Written test 1.1.2 Demonstration & questioning 1.1.3 Observation & questioning	2 hours
	1.2 Assess own work	1.2.1 Perform workplace procedure in documenting completed work 1.2.2 Perform fault identification and reporting 1.2.3 Observe safety and environmental aspects of production processes 1.2.4 Utilize workplace quality indicators 1.2.5 Document and report deviations from specified quality standards	1.2.1 Field trip 1.2.2 Symposium 1.2.3 Simulation 1.2.4 On the job training	1.2.1 Demonstration & questioning 1.2.2 Observation & questioning	2 hours
	1.3 Engage in quality improvement	1.3.1 Participate in quality improvement processes a. IEC/ISO standards b. Environmental and safety standards 1.3.2 Carry out work as per process improvement procedures 1.3.3 Monitor operation performance 1.3.4 Implement continuous improvement	1.3.1 Field trip 1.3.2 Symposium 1.3.3 Simulation 1.3.4 On the job training	1.3.1 Demonstration & questioning 1.3.2 Observation & questioning	8 hours
2. Comply with environmental protection procedures	2.1 Access information concerning environmental protection regulations and procedures	2.1.1 Lecture on relevant environmental protection regulations & codes of practice 2.1.2 Lecture/Discussion on environmental risks associated with workplace operations and related precautions to control the risk 2.1.3 Lecture/Discussion on environmental protection standards required in the workplace	2.1.1 Lecture 2.1.2 Discussion 2.1.3 Demonstration 2.1.4 Viewing multimedia 2.1.5 Hands on practice	2.1.1 Observation in workplace 2.1.2 Demonstration 2.1.3 Oral questioning 2.1.4 Third Party Report	4 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		2.1.4 Lecture on workplace reporting and recording processes and procedures 2.1.5 Accessing information and data 2.1.6 Identifying potential environmental risks and ways of minimizing them			
	2.2 Implement and monitor procedures concerning environmental hazards	2.2.1 Applying environmental protection regulations & codes of practice concerning environmental hazards 2.2.2 Lecture/Discussion on workplace procedures and guidelines for implementing and monitoring procedures concerning environmental hazards 2.2.3 Lecture/Discussion on workplace environmental hazards and related hazard control measures 2.2.4 Using equipment and resources required when implementing and monitoring environmental protection procedures 2.2.5 Lecture/Discussion on Organizational structure and site layout 2.2.6 Reporting and recording processes and procedures 2.2.7 Application of problem solving techniques 2.2.8 Identifying potential environmental hazards and ways on minimizing them 2.2.9 identifying and correctly using equipment and vehicles in accordance with environmental protection regulations and guidelines	2.2.1 Lecture 2.2.2 Discussion 2.2.3 Demonstration 2.2.4 Viewing multimedia 2.2.5 Hands on practice	2.2.1 Observation in workplace 2.2.2 Demonstration 2.2.3 Oral questioning 2.2.4 Third Party Report	4 hours
	2.3 Implement and monitor environmental control procedures	2.3.1 Applying relevant environmental protection regulations & codes of practice for environmental control procedures 2.3.2 Lecture/Discussion on workplace procedures and guidelines for implementing and monitoring environmental control procedures	2.3.1 Lecture 2.3.2 Discussion 2.3.3 Demonstration 2.3.4 Viewing multimedia 2.3.5 Hands on practice	2.3.1 Observation in workplace 2.3.2 Demonstration 2.3.3 Oral questioning	4 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		2.3.3 Using equipment and resources required when implementing and monitoring environmental control procedures 2.3.4 Carry out workplace reporting and recording processes and procedures 2.3.5 Application of problem solving techniques 2.3.6 counsel, advise and inform others on environmental control procedures 2.3.7 identifying and correctly using equipment and vehicles in accordance with environmental control procedures, regulations and guidelines			
3. Observe procedures, Specifications and Manuals of Instructions	3.1. Identify and access specification/ manuals	3.1.1. Familiarization on types of manuals used in transmission lines 3.1.2. Identification of symbols used in the manuals 3.1.3. Discussion on manuals and specifications 3.1.4. Accessing information and data	3.1.1. Lecture-demonstration	3.1.1. Oral questioning 3.1.2. Written test or examination	2 Hours
	3.2. Interpret manuals	3.2.1. Interpretation of symbols used in manuals 3.2.2. Lecture and discussion on system of measurements 3.2.3. Lecture on Unit conversion 3.2.4. Accessing information and data	3.2.1. Actual demonstration 3.2.2. Group discussion	3.2.1. Direct observation 3.2.2. Written test or examination	2 Hours
	3.3. Apply information in manual	3.3.1. Application of symbols in manuals 3.3.2. Applying conversion of units of measurements 3.3.3. Applying information from manuals	3.3.1. Demonstration 3.3.2. Group discussion	3.3.1. Demonstration Practical and oral exam	2 Hours
	3.4. Store Manual	3.4.1. Manual storing and maintaining procedures 3.4.2. Storing and maintaining manuals	3.4.1. Demonstration 3.4.2. Group discussion	3.4.1. Demonstration 3.4.2. Practical and oral exam	2 Hours
4. Maintain and operate line tools and equipment	4.1 Plan and prepare for work to operate and maintain T/L tools and equipment	4.1.1 Acquire sample work instruction 4.1.2 Interpret sample work instruction 4.1.3 Identify necessary and appropriate occupational health and safety requirements based on job specification 4.1.4 Identify relevant transmission line tools, equipment and hardware based on job specifications	4.1.1 Lecture 4.1.2 Discussion 4.1.3 Demonstration 4.1.4 Viewing multimedia 4.1.5 Hands on practice	4.1.1 Observation in workplace 4.1.2 Demonstration 4.1.3 Oral questioning	2 hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	4.2 Prepare T/L hardware, tools and equipment for operation and maintenance	4.2.1 Enumerate the personal protective equipment in preparing T/L tools, hardware and equipment as per job requirements 4.2.2 Procedures in acquiring transmission line tools, equipment and hardware 4.2.3 Perform functionality test of transmission hot line tools as per manufacturers standards	4.2.1 Lecture 4.2.2 Discussion 4.2.3 Demonstration 4.2.4 Viewing multimedia 4.2.5 Hands on practice	4.2.1 Observation in workplace 4.2.2 Demonstration 4.2.3 Oral questioning	2 hour
	4.3 Operate T/L tools and equipment	4.3.1 Enumerate the personal protective equipment in operating T/L tools, hardware and equipment as per job requirements 4.3.2 Discuss procedures in proper handling and application of T/L tools and equipment based on job assignments 4.3.3 Discuss special features and function of identified T/L tools and equipment	4.3.1 Lecture 4.3.2 Discussion 4.3.3 Demonstration 4.3.4 Viewing multimedia 4.3.5 Hands on practice	4.3.1 Observation in workplace 4.3.2 Demonstration 4.3.3 Oral questioning	4 hours
	4.4 Check condition of T/L tools and equipment	4.4.1 Discuss and classify T/L tools and equipment based on different usage and requirements 4.4.2 Study proper segregation of functional and non-functional T/L tools and equipment 4.4.3 Analyze different safety procedures in handling tools and equipment as per manufacturer's instructions 4.4.4 Examine condition of Personal protective equipment and tools	4.4.1 Lecture 4.4.2 Discussion 4.4.3 Demonstration 4.4.4 Viewing multimedia 4.4.5 Hands on practice	4.4.1 Observation in workplace 4.4.2 Demonstration 4.4.3 Oral questioning	2 hours
	4.5 Perform basic preventive maintenance	4.5.1 Identify appropriate and different types of lubricants for different type and condition of equipment. 4.5.2 Review lubrication procedures in every preventive maintenance 4.5.3 Explain and perform testing and cleaning of transmission line tools and equipment 4.5.4 Practice inspection of working and non-working tools and equipment	4.5.1 Lecture 4.5.2 Discussion 4.5.3 Demonstration 4.5.4 Viewing multimedia 4.5.5 Hands on practice	4.5.1 Observation in workplace 4.5.2 Demonstration 4.5.3 Oral questioning	4 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		4.5.5 Perform repair and replacement of components and parts for damage and non-working equipment 4.5.6 Discuss good housekeeping after preventive maintenance procedure			
	4.6 Store tools and equipment	4.6.1 Discuss proper inventory and auditing of tools and equipment as per company procedure 4.6.2 Describe and determine different storage places for different tools and equipment 4.6.3 Identify conditions, weather and surroundings appropriate and not appropriate for storage of tools and equipment 4.6.4 Create checklist for inventory and auditing of T/L tools and equipment	4.6.1 Lecture 4.6.2 Discussion 4.6.3 Demonstration 4.6.4 Viewing multimedia 4.6.5 Hands on practice	4.6.1 Observation in workplace 4.6.2 Demonstration 4.6.3 Oral questioning	2 hours
5. Perform Computer Operations	5.1 Plan and prepare for task to be undertaken	5.1.1 Plan and prepare computer operation activity 5.1.2 Determine task requirements based on required output 5.1.3 Determine appropriate hardware and software 5.1.4 Identify/Select types of computers and basic features of different operating systems 5.1.5 Interpret and follow client-specific guidelines & procedures 5.1.6 Plan task as per data security guidelines	5.1.1 Lecture 5.1.2 Modular 5.1.3 Computer based training (e-learning) 5.1.4 Project method 5.1.5 On the job training	5.1.1 Written/Oral examination 5.1.2 Practical demonstration	2 hours
	5.2 Input data into computer	5.2.1 Apply basic ergonomics of keyboard and computer user 5.2.2 Enter/Encode data using appropriate computer programs/applications 5.2.3 Check accuracy of encoded data/information per SOP 5.2.4 Save and store inputted data in storage media 5.2.5 Storage devices and basic categories of memory 5.2.6 Identify and define relevant types of software	5.2.1 Lecture 5.2.2 Modular 5.2.3 Group discussion 5.2.4 Project method 5.2.5 On the job training	5.2.1 Written/Oral examination 5.2.2 Practical demonstration	2 hour
	5.3 Access information using computer	5.3.1 Select correct program/ application based on job requirements 5.3.2 Access computer data/files	5.3.1. Lecture	5.3.1. Written/Oral examination	2 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		5.3.3 Interpret general security, privacy legislation & copyright 5.3.4 Use Productivity Application 5.3.4.1 Microsoft office applications 5.3.5 Learn Business Application 5.3.5.1 Introduction to Basic Programming software 5.3.6 Apply basic ergonomics of keyboard and computer user	5.3.2. Computer based training (e-learning) 5.3.3. On the job training	5.3.2. Practical demonstration	
	5.4 Produce/ output data using computer system	5.4.1 Identify types and function of computer peripheral devices 5.4.2 Print and scan office documents and materials 5.4.3 Send office/ business documents through facsimile 5.4.4 Transfer files or data between compatible systems using computer software, hardware/ peripheral devices 5.4.5 Save documents in storage devices 5.4.5.1 CD/DVD 5.4.5.2 USB drives 5.4.5.3 Hard disk drives	5.4.1 Lecture 5.4.2 Group discussion 5.4.3 Modular 5.4.4 On the job training	5.4.1 Written/Oral examination 5.4.2 Practical demonstration	2 hour
	5.5 Maintain computer equipment and systems	5.5.1 Perform computer equipment/ system basic maintenance procedures 5.5.1.1 Perform basic file maintenance procedures 5.5.1.2 Perform cleaning of PC parts/ hardware components 5.5.1.3 Scan/Debug computer software and applications 5.5.1.4 Perform cleaning and defragmentation of computer files 5.5.1.5 Perform backup of computer files 5.5.2 Enumerate and define different types of computer viruses	• Demonstration • Simulation • Modular • Video clips • Computer based training (e-learning)	• Written/Oral examination • Practical demonstration	4 hours

CORE COMPETENCIES
(116 hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
1. Install/construct new transmission line structures	1.1. Plan and prepare for work	1.1.1. Discussion on maintenance order form 1.1.2. Lecture on occupational health and safety requirements 1.1.3. Identification of tools, equipment and hardware as per job specifications 1.1.4. Lecture on DOLE-OSHS Rule 1410 – Construction Safety	1.1.1. Lecture & Discussion 1.1.2. PowerPoint presentation 1.1.3. Video presentation	1.1.1. Written Exam 1.1.2. Oral interview 1.1.3. Demonstration	1 hour
	1.2. Prepare hardware, transmission line tools and equipment for pole erection	1.2.1. Lecture on DOLE-OSHS Rule 1080 – Personal Protective Equipment and Devices 1.2.2. Identification of personal protective equipment (PPE) and its usage 1.2.3. Identification of transmission line tools and equipment and its usage 1.2.4. Discussion on the condition of tools and equipment in accordance with its corresponding manual	1.2.1. Lecture Discussion 1.2.2. PowerPoint presentation 1.2.3. Video presentation 1.2.4. Actual Demonstration	1.2.1. Written Exam 1.2.2. Oral interview 1.2.3. Demonstration	3 hours
	1.3. Perform pole staking and excavation	1.3.1. Discussion on pole staking requirements according to area condition. 1.3.2. Lecture and discussion on excavation standard according to company and safety requirements. 1.3.2.1. Soil bearing capacity 1.3.2.2. Depth of hole 1.3.2.3. Diameter of pole hole 1.3.3. Lecture on DOLE-OSHS Rule 1413 – Excavation	1.3.1. Lecture Discussion 1.3.2. PowerPoint presentation 1.3.3. Video presentation	1.3.1. Written Exam 1.3.2. Oral interview	4 hours
	1.4. Transport and drag pole to job site	1.4.1. Discussion on loading and unloading method of according to safety requirements 1.4.2. Discussion on hauling method of poles based on established procedures	1.4.1. Lecture Discussion 1.4.2. PowerPoint presentation 1.4.3. Video presentation	1.4.1. Written Exam 1.4.2. Oral interview	2 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		1.4.3. Discussion on manual dragging technique of poles based on established procedure 1.4.4. Lecture on DOLE-OSHS Rule 1428 – Lines, Blocks, Rigging			
	1.5. Perform pole-setting	1.5.1. Discussion on pole setting method as per job requirements 1.5.2. Discussion on housekeeping procedure in accordance with company procedure 1.5.3. Lecture and exercises on knot tying, reeving and rope splicing 1.5.4. Actual pole setting activity	1.5.1. Lecture Discussion 1.5.2. PowerPoint presentation 1.5.3. Video presentation 1.5.4. Demonstration	1.5.1. Written Exam 1.5.2. Oral interview 1.5.3. Demonstration	16 hours
	1.6. Remove/retire old pole	1.6.1. Identification of transmission line tools and equipment for manual removal method and its usage 1.6.2. Discussion on pole retirement procedure in line with job requirement 1.6.3. Discussion on housekeeping procedure following power industry standard.	1.6.1. Lecture Discussion 1.6.2. PowerPoint presentation 1.6.3. Video presentation	1.6.1. Written Exam 1.6.2. Oral interview	2 hours
2. Perform Overhead Transmission Line Works	2.1. Plan and prepare for work	2.1.1. Discussion on maintenance order form 2.1.2. Identification of relevant occupational health and safety requirements 2.1.3. Identification of transmission line tools, equipment and hardware and its usage in overhead transmission line works	2.1.1. Lecture Discussion 2.1.2. PowerPoint presentation 2.1.3. Video presentation 2.1.4. Actual Demonstration	2.1.1. Written Exam 2.1.2. Oral interview 2.1.3. Demonstration	2 hours
	2.2. Prepare hardware, tools and equipment	2.2.1. Identification of personal protective equipment (PPE) and its usage 2.2.2. Lecture on usage, functions and testing of appropriate materials, tools and equipment in overhead line works	2.2.1. Lecture Discussion 2.2.2. PowerPoint presentation 2.2.3. Video presentation 2.2.4. Field visit 2.2.5. Actual Demonstration	2.2.1. Written Exam 2.2.2. Oral interview 2.2.3. Demonstration	2 hours
	2.3. Perform overhead maintenance work	2.3.1. Discussion and performance of overhead line construction work procedures according to job specifications	2.3.1. Lecture Discussion 2.3.2. PowerPoint presentation 2.3.3. Video presentation	2.3.1. Written Exam 2.3.2. Oral interview 2.3.3. Demonstration	28 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		2.3.2. Lecture on DOLE-OSHS Rule 1210 – Electrical Safety 2.3.3. Lecture and discussion on voltage detector application 2.3.4. Discussion on installation of grounding clusters 2.3.5. Discussion on housekeeping procedure following power industry standard for overhead line works 2.3.6. Preparation of tools for replacement of insulators 2.3.7. Actual replacement of insulators 2.3.8. Actual conductor riding exercises	2.3.4. Field visit 2.3.5. Actual Demonstration		
3. Install Emergency Restoration Structures (ERS)	3.1. Plan and prepare for ERS work	3.1.1. Discussion on work instruction and interpret in accordance to job requirements 3.1.2. Identification of relevant occupational health and safety requirements	3.1.1. Lecture Discussion 3.1.2. PowerPoint presentation 3.1.3. Video presentation 3.1.4. Actual Demonstration	3.1.1. Written Exam 3.1.2. Oral interview 3.1.3. Demonstration	2 hours
	3.2. Prepare ERS hardware, tools and equipment	3.2.1. Identification of personal protective equipment (PPE) and its usage 3.2.2. Identification of relevant occupational health and safety requirements 3.2.3. Discussion of ERS tools, equipment and hardware in line with job requirements. 3.2.4. Lecture on DOLE-OSHS Rule 1150 – Materials Handling and Storage	3.2.1. Lecture Discussion 3.2.2. PowerPoint presentation 3.2.3. Video presentation 3.2.4. Field visit 3.2.5. Actual Demonstration	3.2.1. Written Exam 3.2.2. Oral interview 3.2.3. Demonstration	2 hours
	3.3. Loading and hauling of ERS major components	3.3.1. Discussion on ERS tools, equipment and hardware in line with job requirements. 3.3.2. Discussion on loading and unloading procedure of ERS based on safety requirements 3.3.3. Discussion on ERS hauling method based on manufacturer's safety procedures	3.3.1. Lecture Discussion 3.3.2. PowerPoint presentation 3.3.3. Video presentation 3.3.4. Field visit 3.3.5. Actual Demonstration	3.3.1. Written Exam 3.3.2. Oral interview 3.3.3. Demonstration	4 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	3.4. Perform anchor rod staking and ERS setting	3.4.1. Identification of ERS location and terrain 3.4.2. Discussion on anchor rod staking procedure in line with the manufacturer's designed data. 3.4.3. Installation of Manta ray anchor 3.4.4. Perform Hydraulic power unit (HPU) and load locker operation	3.4.1. Lecture Discussion 3.4.2. PowerPoint presentation 3.4.3. Video presentation 3.4.4. Field visit 3.4.5. Actual Demonstration	3.4.1. Written Exam 3.4.2. Oral interview 3.4.3. Demonstration	8 hours
	3.5. Erect and dismantle ERS	3.5.1. Discussion on ERS tools, equipment and hardware in line with job requirements. 3.5.2. Discussion on ERS erection and dismantling procedure in line with job requirements 3.5.3. Discussion on stringing procedure in line with job requirements 3.5.4. Lecture on DOLE-OSHS Rule 1428 - Lines, Blocks, Rigging 3.5.5. Actual erection and dismantling of ERS	3.5.1. Lecture Discussion 3.5.2. PowerPoint presentation 3.5.3. Video presentation 3.5.4. Field visit 3.5.5. Actual Demonstration	3.5.1. Written Exam 3.5.2. Oral interview 3.5.3. Demonstration	16 hours
	3.6. Install ERS components	3.6.1. Lecture and discussion on: 3.6.1.1. ERS components 3.6.1.2. usage and function of ERS hardware's, tools and equipment 3.6.1.3. Rigging technique 3.6.2. Installation of ERS components	3.6.1. Lecture Discussion 3.6.2. PowerPoint presentation 3.6.3. Video presentation 3.6.4. Field visit 3.6.5. Actual Demonstration	3.6.1. Written Exam 3.6.2. Oral interview 3.6.3. Demonstration	8 hours
4. Perform Earth/ Ground Resistance Testing	4.1. Plan and prepare for work	4.1.1. Lecture and discussion on 4.1.1.1. usage and function of ground resistance tester 4.1.1.2. rod distance measurement 4.1.2. Discussion on maintenance order form 4.1.3. Identify relevant occupational health and safety requirements	4.1.1. Lecture Discussion 4.1.2. PowerPoint presentation 4.1.3. Video presentation 4.1.4. Actual Demonstration	4.1.1. Written Exam 4.1.2. Oral interview 4.1.3. Demonstration	2 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	4.2. Prepare tools and equipment	4.2.1. Checking and discussion on earth resistance tester's operational condition based on equipment manual. 4.2.2. Discussion of procedures in earth/ground testing 4.2.3. Lecture on earth/ground resistance principle	4.2.1. Lecture Discussion 4.2.2. PowerPoint presentation 4.2.3. Video presentation 4.2.4. Field visit 4.2.5. Actual Demonstration	4.2.1. Written Exam 4.2.2. Oral interview 4.2.3. Demonstration	2 hours
	4.3. Conduct earth/ground testing	4.3.1. Identification of test rod location based on equipment instructional manual. 4.3.2. Demonstrate driving of test rod on identified ground location based equipment instructional manual. 4.3.3. Demonstrate lay out of lead wires in accordance with earth/ground procedures. 4.3.4. Demonstrate firm wire contact connections to the test rod and tower body. 4.3.5. Discussion on tester reading and recording based on testing procedures. 4.3.6. Discussion on test results and submission process in accordance with company procedures	4.3.1. Lecture Discussion 4.3.2. PowerPoint presentation 4.3.3. Video presentation 4.3.4. Field visit 4.3.5. Actual Demonstration	4.3.1. Written Exam 4.3.2. Oral interview 4.3.3. Demonstration	12 hours

ELECTIVE COMPETENCIES
(150 hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
5. Perform hotline Maintenance Work	5.1. Plan and prepare for hotline work	5.1.1. Discussion on maintenance order form, approved caution tag and hotline order 5.1.2. Identification of relevant occupational health and safety requirements in hotline work 5.1.3. Identification of relevant transmission hotline tools, equipment and hardware and its usage	5.1.1. Lecture Discussion 5.1.2. PowerPoint presentation 5.1.3. Video presentation 5.1.4. Actual Demonstration	5.1.1. Written Exam 5.1.2. Oral interview 5.1.3. Demonstration	2 hours
	5.2. Prepare hardware, transmission line tools and equipment	5.2.1. Lecture on DOLE-OSHS Rule 1080 – Personal Protective Equipment and Devices 5.2.2. Identification of hotline tools, equipment and hardware and its usage 5.2.3. Discussion and demonstration of cleaning and testing procedures of hot-stick based on manufacturer's standards	5.2.1. Lecture Discussion 5.2.2. PowerPoint presentation 5.2.3. Video presentation 5.2.4. Field visit 5.2.5. Actual Demonstration	5.2.1. Written Exam 5.2.2. Oral interview 5.2.3. Demonstration	8 hours
	5.3. Perform Hotline maintenance procedure	5.3.1. Lecture on DOLE-OSHS Rule 1210 – Electrical Safety and Rule 1410 – Construction Safety 5.3.2. Identification of personal protective equipment (PPE) and its usage in hotline works 5.3.3. Discussion on hotline maintenance work procedure based on job requirements. 5.3.4. Actual replacement and removal of pole 5.3.5. Actual replacement of insulators 5.3.6. Actual replacement of cross arm 5.3.7. Discussion on housekeeping procedure	5.3.1. Lecture Discussion 5.3.2. PowerPoint presentation 5.3.3. Video presentation 5.3.4. Field visit 5.3.5. Actual Demonstration	5.3.1. Written Exam 5.3.2. Oral interview 5.3.3. Demonstration	140 hours

3.2 TRAINING DELIVERY

1. The delivery of training shall adhere to the design of the curriculum. Delivery shall be guided by the principles of competency-based TVET.

    a. Course design is based on competency standards set by the industry or recognized industry sector; **(Learning system is driven by competencies written to industry standards)**

    b. Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;

    c. Training can be done on an actual workplace setting, simulation of a workplace and/or through adoption of modern technology.

    d. Assessment is based in the collection of evidence of the performance of work to the industry required standards;

    e. Assessment of competency takes the trainee's knowledge and attitude into account but requires evidence of actual performance of the competency as the primary source of evidence.

    f. Training program allows for recognition of prior learning (RPL) or current competencies;

    g. Training completion is based on satisfactory performance of all specified competencies.

2. 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 and their variations/components may be adopted singly or in combination with other modalities when designing and delivering training programs:

    2.1. Institution- Based:

    - Dual Training System (DTS)/ Dualized Training Program (DTP) which contain both in-school and in-industry training or fieldwork components. Details can be referred to the Implementing Rules and Regulations of the DTS Law and the TESDA Guidelines on the DTP;

    - Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, audio, video, computer technologies or other modern technology that can be used to facilitate learning and formal and non-formal training. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

    - The traditional classroom-based or in-center instruction may be enhanced through use of learner-centered methods as well as laboratory or field-work components.

2.2. Enterprise-Based:

- Formal Apprenticeship – Training within employment involving a contract between an apprentice and an enterprise on an approved apprenticeable occupation.

- Informal Apprenticeship - is based on a training (and working) agreement between an apprentice and a master craftsperson wherein the agreement may be written or oral and the master craftsperson commits to training the apprentice in all the skills relevant to his or her trade over a significant period of time, usually between one and four years, while the apprentice commits to contributing productively to the work of the business. Training is integrated into the production process and apprentices learn by working alongside the experienced craftsperson.

- Enterprise-based Training- where training is implemented within the company in accordance with the requirements of the specific company. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

2.3. Community-Based:

- Community-Based – short term programs conducted by non-government organizations (NGOs), LGUs, training centers and other TVET providers which are intended to address the specific needs of a community. Such programs can be conducted in informal settings such as barangay hall, basketball courts, etc. These programs can also be mobile training program (MTP).

3.3 TRAINEE ENTRY REQUIREMENTS

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

- Must have completed training or holder of Transmission Line Installation and Maintenance NC II with at least 1-yr work experience in transmission line installation and maintenance; **or**

- Must be a holder of Electrical Power Distribution Line Construction NC II with at least 2-yrs of work experience in distribution line construction and maintenance

- Able to communicate both in oral and written (either in English or local dialect)

- Must be physically fit

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

Recommended list of tools, equipment and materials for the training of 20 trainees for Transmission Line Installation and Maintenance NC III:

TOOLS		EQUIPMENT		HARDWARE	
QTY	**ITEM**	**QTY**	**ITEM**	**QTY**	**ITEM**
6 pc	Pliers 9”	2 pc	Lever hoist 1.6 tons	15 pcs.	Insulator, porcelain 15k lbs
6 pc	Ballpeen hammers, 2 lbs	1 set	Capstan/Hand winch (includes tightener)	1 pc	Steel pole
6 pc	Screwdrivers 10” - type	1 pc	Cable height meter	2 pc	Crossarm, tubular 10’
6 pc	Screw driver 10” + type	1 pc	Mega phone	2 pc	Crossarm, tubular 8’
4 set	Hacksaw	2 pc	Lever hoist 3.2 tons	4 pc	Angle crossarm brace
6 pc	Adjustable wrenches 12’	6 pc	Snatch block	10 pc	Machine bolt 5/8” Ø x 12”
2 pcs.	Auger bit 5/8” Ø,	6 set	Climbing set	10 pc	Machine bolt 5/8” Ø x 16”
1 pc	Bolt cutter	1 pc	Hydraulic cutter	10 pc	Machine bolt 1/2” Ø x 6”
2 pc	Straight shovel 8’	1 unit	Splicing machine	6 pc	Oval eye bolt 5/8” Ø x 10”
2 pc	Shovel, spoon 8’	1 pc	Ladder, adj, instd 12’ extendable up to 20’	12 pc	Oval eye bolt 5/8” Ø x 6”
2 pc	Digging bar 5’	1 unit	Chainsaw	12 pc	Washer, flat square 4”x4” x ¼” for 5/8” Ø
2 pc	Shovel, spade	2 pc	Puller cable 1.5 ton (tirfor)	12 pc	Washer, curve square 4”x4” x ¼” for 5/8” Ø
2 pc	Digger, hole 8’	1 set	Grounding cluster, all angle clamp	6 pc	Y-ball cleaves
2 pc	Steel tape 5 mtr.	1 set	Wedge connector tool	6 pc	Clamp, suspension with socket eye for 336.4MCM ACSR
2 pc	Cant hook	1 set	Earth Resistance tester	4 pc	Clamp, suspension for OHGW, steel
1 pc	Binocular, telescope	1 set	Voltage detector (non-contact) multi range	6 pc	Armor rod preformed 336.4 MCM, ACSR
4 pc	Block snatch, single sheave, aluminum	1 set	Compression machine	6 pc	Anchor shackle 5/8” Ø
2 pc	Block, triple sheave, steel	2 set	Hoist, capstan, motorized	6 pc	Screw, anchor, thimble eye 5/8” Ø x 6’
2 pc	Block, triple sheave, steel	1 unit	Line Truck	6 pc	Rod, anchor thimble eye 5/8” Ø x 8’
2 pc	Wire grip pulling for 336.4 MCM	1 unit	Pole trailer/ stake truck	200 mtr	Guy wire, 7/16” Ø
2 pc	Wire grip pulling for 795 MCM	1 set	Reel stand, stationary	4 pc	Bond, pole 10”

TOOLS		EQUIPMENT		HARDWARE	
QTY	**ITEM**	**QTY**	**ITEM**	**QTY**	**ITEM**
1 roll	Rope polydacron ½" Ø,			6 pc	Guy grip, preformed 7/16" Ø
1 roll	Rope polydacron 5/8" Ø		**PPE**	12 pc	Double arming bolt, 5/8" Ø x22" w/ 4nuts
2 pc	Steel sling 3/8" Ø, 3'L	20 pc	Hard hat	3 pc	Eye nut 5/8" Ø
2 pc	Sling, webbing, 2"Ø,4' L	20 pair	Safety shoes	6 pc	Connector, wedge type 336.4x336.4MCM
2 pc	Sling, webbing, 2"Ø,3' L	20 pc	Safety goggles	6 pc	Strain clamp with socket eye, 336.4 MCM
1 pc	Skinning knife	20 pair	safety gloves	3 pcs	Composite insulator, suspension 70Kn
1 pc	Level, spirit	20 pc	Working clothes	2 pc	Crossarm tubular 23 '
4 pc	Roller, Stringing alloy	2 set	First-aid kit set	2 pc	X-brace, steel
4 pc	Roller, Stringing steel	1 pc	Spine board	4 pc	X-brace end fitting
1 set	Wrench, socket, automatic ½" square drive	2 set	Harness, full body with fall arrest lanyard, chest and back	3 pc	Double arming plate
1 pc	Digital camera			6 pc	Angle support
2 pc	Tool bucket			6 pc	Twisted shackle 5/8" Ø
4 pc	Cutter key puller			6 pc	Ball clevis 5/8" Ø
				4 pc	Strain clamp for OHGW, steel
				1pc	Crossarm tubular 13' 6"
				1 pc	Crossarm tubular 19' 6"
				3 pc	Long bolt eye 5/8" Ø
				200mtr	OHGW 3/8" Ø
				300 mtr	ACSR 336.4 MCM

ERS Tools & Equipment (SBB)					
TOOLS		**EQUIPMENT**		**HARDWARE**	
QTY	**ITEM**	**QTY**	**QTY**	**ITEM**	**QTY**
1 set	Sliding Gin pole assembly - Gin pole Head assembly - Gin pole tube - Brace assembly - Swivel pulley - Lifting bar	 1unit 1 set 1 pc 3 pcs 1 pc 2 pcs	Anchor Installation set - Jack hammer - Hose - Drive steel Shank Coupler Radius tip Extension	1 pc	Foundation base plate 1.2m x 1.2m
				1 pc	Articulated Base 84cm x 74 cm
				10 pcs	Mast Section 412mm x 412mm x 2.9m
				1 pcs	Top Plate ½" - 45° x 45°
				8 pcs	Anchor stake
				3 pcs	Line post insulator bracket
				3 pcs	Line post end fitting
1 pc	Ball Joint Gin pole 10'	1 unit	Gasoline Capstan 1t	6 pcs	Guy strain insulators
2 pcs	Riggers Pole arrest Device	1 unit	Hydraulic power unit assembly (HPU)	1 reel	Guy cables 9/16"
4 pcs	Ratchet Wrench ½ drive 15"L with deep socket 32"dia	1 set	Load Locker - Extractor Bar - Base	10 pcs	Swivel guy plate ¾" dia x 11"L(423mm x 362 x 211mm)
				80 pcs	Bolts and nuts 19mm dia x 279mmL
1pc	Sledge Hammer 5Kg	4 pcs	Grip Puller (Tirfor) 1.5T	8 pcs	Bolts and nuts ¾"dia x 6"L(19mm dia x 152mm)
2 pcs	Alignment clamp	4pcs	Ratchet 1.5 Tons	8 pcs	Preformed guy grip 9/16"dia
4 pcs	Spud wrench 32"dia	4 pcs	Wire grip	8 pcs	Wire rope thimble 5/8"
4 rolls	Polydacron rope 5/8"dia			8 pcs	Automatic guy grip 9/16"
1 pcs	Pipe wrench 16"			40 pcs	Anchor shackle ¾"dia
2 pcs	Tool Bucket			3 pcs	Polymer insulators
4 pcs	Pulling Eye			3 pcs	Polymer line post insulators
8 pcs	Nylon Webbing Sling 1 1/2 " x 6'			8 pcs	Anchor rod and manta ray plate
2 pcs	Single sheave block, aluminum 3"dia			3 pcs	Conductors suspension clamps with socket eye and ball clevis
2 pcs	Resting Platform			8 pcs	Turn buckle 1"dia x 12"
					Chain link ¾"dia
					Triple thimble eye

Note: ERS Tool and Equipment maybe either SBB or Lindsey brand.

ERS Tools & Equipment (Lindsey 1070)					
TOOLS		**EQUIPMENT**		**HARDWARE**	
QTY	**ITEM**	**QTY**	**QTY**	**ITEM**	**QTY**
1 set	Gin pole mast assembly 30' total length - Davit arm - Pivot hinge bracket - Gin pole Slider	1 unit	Hydraulic power unit assembly (HPU) - foot pedal - base mounted capstan	1 unit	Foundation base plate
				8 pcs	Foundation stake
				1 pcs	Gimbal joint
				1 pcs	Column section 7ft
				4 pcs	Column section 14ft
4 pcs	Webbing Sling 2" x 4'	1 unit	Load Locker - Extractor Bar - Base	2 pcs	Column section 21ft
1 pcs	Webbing sling 2 1/2" 10'			3 pcs	Box section
4 pcs	Spud wrench 32"dia			1 pcs	Guy plate 0° x 45°
4 pcs	Ratchet Wrench ½ drive 15"L with deep socket 32"dia	1unit	Anchor Installation set - Jack hammer	3 pcs	Guy plate 45° x 45°
				1 pc	Guy plate 0° x 0°
4 rolls	Polydacron rope 5/8"dia	2 set	- Hose	3 pcs	Post insulator
2 pcs	Tool Bucket		- Drive steel	3 pcs	Composite insulator eye-eye
4 pcs	Pulling Eye	1 pc	Shank	3 pcs	End cap adapter
2 pcs	Single sheave block, aluminum 3"dia	3 pcs	Coupler	3 pcs	Insulator universal joint
		1 pc	Radius tip	3 pcs	Adjustable extension strap
		2 pcs	Extension		
4 pcs	Construction yoke plate	4 pcs	Ratchet Hoist 3 tons	8 pcs	Guy strain insulator
		4 pcs	ERS Wire grip	12 pcs	Anchor and Mantaray anchor plate
				4 pcs	Anchor rod coupler
				40 pcs	Shackle ¾"dia
				3 pcs	Turn buckle ¾"dia
				3 pcs	Chain link ¾"dia
				16 pcs	Wire rope thimble
				16 pcs	Triple thimble eye
				24 pcs	Preformed guy grip

Note: ERS Tool and Equipment maybe either SBB or Lindsey brand.

HOTLINE TOOLS AND EQUIPMENT					
TOOLS		**EQUIPMENT**		**HARDWARE**	
QTY	**ITEM**	**QTY**	**QTY**	**ITEM**	**QTY**
3 pcs	Wire Tong 1 ½ “dia x 10’	1 unit	Hot stick tester		
3 pcs	Wire tong 2 ½ ”dia x 10’	1 unit	Ladder Monitoring kit		
3 pcs	Wire tong pole saddle and clamp with tightener 1 ½”dia				
3 pcs	Wire tong pole saddle and clamp with tightener 2 ½ ”dia				
3 pcs	Wire tong pole saddle and clamp with tightener and extension 2 ½ ”dia				
3 pcs	Wire tong pole saddle and clamp with tightener and extension 1 ½”dia				
1 set	Spliced Wire tong 2 1/2 “dia x 16’				
2 pcs 2 pcs 2 pcs 1 pc 1 pc 1 pc 1 pc 1 pc 1 pc 1 pc 1 pc 1 pc	Universal stick 1 ½ “dia x 10’ Accessories - Insulator fork - Shepherd Hook - Cotter key installing tool - Ball socket adjuster - Clevis pin installer - Rotary prong - Clevis Pin holder - Cotter key remover - Universal adapter - Locating pin - Cotter key tool				
2 pcs	Roller Link stick 1 1/4”dia x 4’”				
2 pcs	Spiral link stick 1 ¼”dia x 15”				
2 pcs	Insulated link stick 1 ¼”dia x 18”				
2 pcs	Cross arm tool hanger bracket				
1 pc	Grip all clamp stick 11/4”dia x 8				
2 pcs	Hotline clamp # 2/0 – 4/0				
2 pcs	Conductor cover 5’				
1 set	Conductive suite with gloves and socks				
2 pcs	Tool Bucket				

HOTLINE TOOLS AND EQUIPMENT					
TOOLS		EQUIPMENT		HARDWARE	
QTY	ITEM	QTY	QTY	ITEM	QTY
2 pcs	Glass fiber filled nylon rope block, single sheave				
2 pcs	Glass fiber filled nylon rope block, double sheave 4”dia				
2 pcs	Glass fiber filled nylon rope block, triple sheave 4”dia				
1 pc	Wire tong pole clamp 1 ½”dia				
1 pc	Wire tong pole clamp 2 ½”dia				
1 pc	Wire tong Swivel 2 ½”dia				
1 pc	Arbor adapter				
2 pcs	Handline block, aluminum 1,000lb working load				
2 pcs	Hotline Tool Rack				
1 pc	Tarpaulin				
10 pcs	Hot sick wiping cloth				
2 pcs	Pole cover 48”L				
1 pc	Rope snubbing bracket 36”chains				

3.5 TRAINING FACILITIES

Based on class size of 20 students/trainees the space requirements for the teaching/learning and circulation 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
Training Area (***Field-based***)	15 X 50	750	1	750
Learning Resource Area	4 x 5	20	1	20
Tool Room / Storage Area	4 x 5	20	1	20
Wash ,Toilet & Locker Room	3 x 5	15	1	15
Total				853
Facilities / Equipment / Circulation*				256
Total Area				**1,109**

**** Area requirement is equivalent to 30% of the total teaching/learning areas***

3.6 TRAINERS QUALIFICATIONS

- Holder of National TVET Trainer's Certificate (NTTC) Level 1 in Transmission Line Installation and Maintenance NC III;
- With at least minimum of five (5) years relevant transmission line installation and maintenance experience within the last 10 years;
- Must have completed the 40 hours Construction Occupational Safety and Health (COSH) Course per Department Order No. 13 s. 1998, Guidelines Governing Occupational Safety and Health in the Construction Industry conducted by OSHC and DOLE accredited Safety Training Organizations;
- Must be computer literate; and
- Must be physically fit.

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. The institutional assessment is administered by the trainer/assessor.

The result of the institutional assessment may be considered as evidence for the assessment for national certification.

SECTION 4 ASSESSMENT AND CERTIFICATION ARRANGEMENTS

Competency Assessment is the process of collecting evidence and making judgments whether competency has been achieved. The purpose of assessment is to confirm that an individual can perform to the standards expected at the workplace as expressed in relevant competency standards.

The assessment process is based on evidence or information gathered to prove achievement of competencies. The process may be applied to an employable unit(s) of competency in partial fulfillment of the requirements of the national qualification.

4.1 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1.1. To attain the National Qualification of the qualification, the candidate must demonstrate in all the units listed in Section 1. Successful candidates shall be awarded a **National Certificate III** signed by the TESDA Director General.

4.1.2. The qualification of **Transmission Line Installation and Maintenance NC III** may be attained by demonstration of competence through project-type assessment covering Basic, Common and Core Units of Competency.

4.1.3. Assessment shall cover all competencies, with basic and common integrated or assessed concurrently with the core units of competency.

4.1.4. Any of the following are qualified to apply for assessment and certification:

4.1.3.1 Graduates of formal training on Transmission Line Installation and Maintenance NC III or related trainings provided by enterprise/s;

4.1.3.2 Individuals who has completed 6 months lineman's training and apprenticeship program. He/she must have experience working in tasks related to "Emergency Restoration Structure (ERS)";

4.1.3.3 Holders of Transmission Line Installation and Maintenance NC II with at least 2 years work experience in transmission line installation/ construction and maintenance and he/she must have experience working in tasks related to "Emergency Restoration Structure (ERS);

4.1.3.4 Holders of Electrical Power Distribution Line Construction NC II with at least 3 years of work experience in distribution line installation/ construction and maintenance and he/she must have experience working in tasks related to "Emergency Restoration Structure (ERS)".

4.1.5. The candidate may opt for portfolio assessment with interview if he/she has at least 4 years of relevant work experience (within the last 6 years) in transmission line installation/construction and maintenance and he/she must have experience working in tasks related to "Emergency Restoration Structure (ERS)".

The candidate must show sufficient evidences on the above requirements in his/her portfolio. Necessary documents to be submitted are: Certificate of

Employment (indicating position, nature of work and period), Training Certificate/s (local or international) on transmission line installation/ construction and maintenance and other relevant trainings.

4.1.6. The existing NCs or COCs in Transmission Line Installation and Maintenance NC III are still valid until the said NCs or COCs have expired. Individuals are advised to take the assessment for this amended/updated TR on or before the expiration of such certificates.

4.1.7. The guidelines on assessment and certification are discussed in detail in the "Operating Procedures on Assessment and Certification" and "Guidelines on the Implementation of the Philippine TVET Competency Assessment and Certification System (PTCACS)".

4.2 COMPETENCY ASSESSMENT REQUISITE

4.2.1 Self-Assessment Guide. The self-assessment guide (SAG) is accomplished by the candidate prior to actual competency assessment. SAG is a pre-assessment tool to help the candidate and the assessor determine what evidence is available, where gaps exist, including readiness for assessment.

This document can:

a. Identify the candidate’s skills and knowledge
b. Highlight gaps in candidate’s skills and knowledge
c. Provide critical guidance to the assessor and candidate on the evidence that need to be presented
d. Assist the candidate to identify key areas in which practice is needed or additional information or skills that should be gained prior `

4.2.2 Accredited Assessment Center. Only assessment center accredited by TESDA is authorized to manage the assessment activities of candidates for national certification.

4.2.3 Accredited Competency Assessor. Only competency assessor accredited by TESDA is authorized to assess the competencies of candidates for national certification.

GLOSSARY 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

19) **Resource Implication -** refer 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

20) **Basic Competencies -** are the skills and knowledge that everyone needs for work

21) **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

22) **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

23) **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

24) **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

SECTOR 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. **Anchor Rod** – used for securing a machine, structure or part to masonry or other material.
3. **Block and Tackle -** is a combination or set of single or several sheaved blocks used to obtain a mechanical advantage in handling heavy loads**.**
4. **Cable Height Meter** - to determine the height of overhead cables
5. **Conductor –** is a conductive material usually made of aluminum or copper used to carry current along the overhead transmission line
6. **Extra High Voltage** (Transmission) – over 230 kV, up to about 800 kV, used for long distance, very high power transmission.
7. **Full Body Harness** - form of protective equipment designed to protect a person from injury due to falling
8. **Grounding Cluster** – used to protect personnel working in de-energized lines, from induced voltage, fault current feed, lightning strikes, erroneous switching & accidental contact with adjacent lines
9. **Ground line maintenance work –** refers to activities in the ground done by transmission line personnel which do not require climbing activity
10. **Groundworks** - a person working at ground level in support of a lineman working overhead.
11. **Guy Wire.** The wire or cable normally used in a down guy is seven-strand galvanized steel wire or seven-strand aluminum clad wire. Alum weld wire consists of steel wire strands coated with a layer of aluminum to prevent corrosion. Guy wire is used in various sizes with diameters from ¼ to 1 ¼ in.
12. **Guy-wire assembly** -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.
13. **Handline** - used for lifting or lowering small objects and also for holding equipment away from the pole as it is being raised
14. **Hazard** - a dangerous condition, potential or inherent, that can bring about an interruption or interfere with the expected orderly progress of an activity. It is any work materials, equipment, methods or practices that have the potential to cause harm to life, health, property or environment.
15. **Hazardous** - an atmosphere that may expose employees to the risk of death, atmosphere incapacitation, impaired ability to self-rescue unaided, injury, or acute illness.
16. **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.

17. **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.
18. **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."
19. **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.
20. **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.
21. **Line to line clearance** – refers to the distance of live conductors to another live conductor.
22. **Line to ground clearance** - refers to the distance of live conductors to the ground
23. **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.
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. **OHSAS 18001** – is a framework for an Occupational Health and Safety (OHS) Management Systems and is part of the OHSAS 18000 series of standards, along with OHSAS 18002.
27. **Overhead ground wire (OHGW)** – is an electrical conductor which provides protection to transmission lines against direct lightning strokes.
28. **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.

29. **Personal Protective Equipment (PPE) -** refers to protective clothing, helmets, goggles, or other garment or equipment designed to protect line personnel from job-related occupational hazards
30. **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.
31. **Philippine Grid Code -** establishes and documents the basic rules, requirements, procedures and standards that govern the operation, maintenance and development of the high-voltage backbone transmission system in the Philippines (Republic Act No. 9136, also known as the "Electric Power Industry Reform Act of 2001)
32. **Pole Dressing** – refers to installation of structure components, such as cross arms, insulators and etc.
33. **Pole Setting** – refers to pole positioning, pole erection and pole facing.
34. **Pre-formed Armor Rod -** 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.
35. **Reeving** - The operation of passing the rope around the sheaves of blocks.
36. **Rigging –** is the term used to described the process of moving/lifting both heavy and light loads using rope, blocks, and other special equipment.
37. **Right of way (ROW)** – the legal right, established by usage or grant, to pass along a specific route through grounds or property belonging to another.
38. **Risks -** a probability or threat of damage, injury, liability, loss or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action.
39. **Slings** - provide a method of attaching rigging tools to structures or equipment. They can be made of rope, webbing or steel. Some slings are made with a continuous loop while others are made with an eye on each end.
40. **Slope Protection –** The protection of an embankment slope against wave action or erosion.
41. **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.
42. **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.
43. **Ultra High Voltage** – higher than 800 kV.
44. **Vibration Damper** - a device used to dissipate the vibration of conductors on a transmission line.
45. **Voltage Detector**- is a sensor used to detect presence of electricity in a wire.

ANNEX A - COMPETENCY MAP

TRANSMISSION LINE INSTALLATION & MAINTENANCE NC III COMPETENCY MAP

BASIC COMPETENCIES

Receive and Respond to Workplace Communication	Work with Others	Demonstrate work values	Practice basic housekeeping procedures	Participate in Workplace Communication	Work in a Team Environment	Practice career professionalism
Practice occupational health and safety procedures	**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

Apply quality standards	**Comply with environmental protection procedures**	**Observe procedures, specifications and manual of instruction**	**Operate and Maintain T/L tools and equipment**	**Operate a personal computer**

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
Perform transmission line pole erection	Perform overhead transmission line work	Perform cold-line maintenance work	Perform live-line maintenance work	Perform ground line maintenance work	Plan transmission line maintenance job	Install emergency restoration structure (ERS)
Inspect/Assess transmission line components' conditions	Implement transmission line maintenance works	Inspect transmission line, poles, towers and appurtenances	Erect distribution line poles	Climb pole and install pole assembly/conductors	Install distribution line equipment and devices	Install consumer service connection facility
Conduct initial root cause analysis	Perform ground transmission line works	Perform overhead maintenance works	**Install/construct new transmission line structures**	**Perform overhead transmission line works**	**Install emergency restoration structure (ERS)**	**Perform earth/ground resistance testing**
Plan assigned maintenance work	Supervise transmission line maintenance work					

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