TRAINING REGULATIONS

ENERGY EFFICIENCY AND CONSERVATION NC III

UTILITIES (ENERGY) SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Luzon Expressway (SLEX), 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 skills 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. Registration and delivery of training programs.
2. Development of curriculum and assessment instruments; and
3. Competency assessment and certification
   .

Each TR has four sections:

Section 1	**Definition of Qualification** describes the qualification and defines the competencies that comprise 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, equipment, and materials; training facilities; trainer's qualification; and institutional assessment.
Section 4	**Assessment and Certification Arrangements** describes the policies governing assessment and certification procedures.

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TRAINING REGULATIONS FOR ENERGY EFFICIENCY AND CONSERVATION NC III

Section 1 ENERGY EFFICIENCY AND CONSERVATION NC III QUALIFICATION

The **Energy Efficiency and Conservation NC III** Qualification consist of competencies that a person must achieve to enable him/her to demonstrate competence, proficiency, and ethical fitness in energy management specifically for the supervision and maintenance of the facilities of Type 1 designated establishments in the proper management of energy consumption of facilities, equipment and devices for efficient and judicious utilization of energy and its continual improvement of energy performance.

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

The units of competency comprising this qualification include the following:

Code	BASIC COMPETENCIES
400311210	Lead workplace communication
400311211	Lead small teams
400311212	Apply critical thinking and problem-solving techniques in the workplace
400311213	Work in a diverse environment
400311214	Propose methods of applying learning and innovation in the organization
400311215	Use information systematically
400311216	Evaluate occupational safety and health work practices
400311217	Evaluate environmental work practices
400311218	Facilitate entrepreneurial skills for micro-small-medium enterprises (MSMEs)

Code	COMMON COMPETENCIES
UTL311208	Apply energy management system (EnMS) standards
UTL311206	Comply with environmental protection and safety procedures
UTL311205	Operate and maintain tools and equipment
UTL311201	Observe procedures, specifications, and manuals of instruction
UTL311207	Perform computer operations

Code	CORE COMPETENCIES
UTL741323	Manage energy consumption of facilities, equipment, and devices
UTL741324	Plan and support the implementation of regular energy audit
UTL741325	Perform energy consumption monitoring and control
UTL741326	Carry out implementation and improvement of energy efficiency measures
UTL741327	Coordinate inventories and purchasing/sourcing of energy efficient equipment, devices, or services
UTL741328	Install, operate, and maintain energy-consuming machines, equipment, and services in facilities

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

- Energy Conservation Officer

SECTION 2: COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common, and core units of competency required for Energy Efficiency and Conservation NC III.

BASIC COMPETENCIES

UNIT OF COMPETENCY : LEAD WORKPLACE COMMUNICATION

UNIT CODE : 400311319

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	• Relevant ***communication method*** is selected based on workplace procedures • Multiple operations Involving several topics/areas are communicated following enterprise requirements • Questioning is applied to gain extra information • Relevant sources of information are identified in accordance with workplace/ client requirements • Information is selected and organized following enterprise procedures • Verbal and written reporting is undertaken when required • Communication and negotiation skills are applied and maintained in all relevant situations	• Organization requirements for written and electronic communication methods • Effective verbal communication methods • Business writing • Workplace etiquette	• Organizing information • Conveying intended meaning • Participating in a variety of workplace discussions • Complying with organization requirements for the use of written and electronic communication methods • Effective business writing • Effective clarifying and probing skills • Effective questioning techniques (clarifying and probing)

2. Lead workplace discussions	• Response to workplace issues is sought following enterprise procedures • Response to workplace issues is provided immediately • Constructive contributions are made to ***workplace discussions*** on such issues as production, quality, and safety • Goals/objectives and action plans undertaken in the workplace are communicated promptly	• Organization requirements for written and electronic communication methods • Effective verbal communication methods • Workplace etiquette	• Organizing information • Conveying intended meaning • Participating in variety of workplace discussions • Complying with organization requirements for the use of written and electronic communication methods • Effective clarifying and probing skills
3. Identify and communicate issues arising in the workplace	• Issues and problems are identified as they arise • Information regarding problems and issues are organized coherently to ensure clear and effective communication • Dialogue is initiated with appropriate personnel • Communication problems and issues are raised as they arise • Identify barriers in communication to be addressed appropriately	• Organization requirements for written and electronic communication methods • Effective verbal communication methods • Workplace etiquette • Communication problems and issues • Barriers in communication	• Organizing information • Conveying intended meaning • Participating in a variety of workplace discussions • Complying with organization requirements for the use of written and electronic communication methods • Effective clarifying and probing skills • Identifying issues • Negotiation and communication skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. 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
2. Workplace discussions	May include: 1.1 Coordination meetings 1.2 Toolbox discussion 1.3 Peer-to-peer discussion

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 Demonstrated leadership skills in workplace communication 1.3 Made constructive contributions in workplace issues 1.4 Sought workplace issues effectively 1.5 Responded to workplace issues promptly 1.6 Presented information clearly and effectively written form 1.7 Used appropriate sources of information 1.8 Asked appropriate questions 1.9 Provided accurate information
2. Resource Implications	The following resources should be provided: 2.1 Variety of Information 2.2 Communication tools 2.3 Simulated workplace
3 Methods of Assessment	Competency in this unit must be assessed through 3.1 Case problem 3.2 Third-party report 3.3 Portfolio 3.4 Interview 3.5 Demonstration/Role-playing
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 : 400311320

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitudes to lead small teams including setting, maintaining, and monitoring 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	• ***Work requirements*** are identified and presented to team members based on company policies and procedures • Reasons for instructions and requirements are communicated to team members based on company policies and procedures • ***Team members' queries and concerns*** are recognized, discussed, and dealt with based on company practices	• Facilitation of Teamwork • Company policies and procedures relating to work performance • Performance standards and expectations • Monitoring individual's and team's performance vis a vis client's and group's expectations	• Communication skills required for leading teams • Group facilitation skills • Negotiating skills • Setting Performance expectation
2. Assign responsibilities	• Responsibilities are allocated having regard to the skills, knowledge and aptitude required to undertake the assigned task based on company policies. • Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible	• Work plan and Procedures • Work requirements and targets • Individual and group expectations and assignments • Ways to improve group leadership and membership	• Communication skills • Management skills • Negotiating skills • Evaluation skills • Identifying team member's strengths and rooms for improvement

3. Set performance expectations for team members	• Performance expectations are established based on client needs • Performance expectations are based on individual team members knowledge, skills, and aptitude • Performance expectations are discussed and disseminated to individual team members	• One's roles and responsibilities in the team • Feedback giving and receiving • Performance expectation	• Communication skills • Accurate empathy • Congruence • Unconditional positive regard • Handling of Feedback
4. Supervised team performance	• Performance is ***monitored*** based on defined performance criteria and/or assignment instructions • Team members are provided with ***feedback***, positive support, and advice on strategies to overcome any deficiencies based on company practices • ***Performance issues*** which cannot be rectified or addressed within the team are referenced to appropriate personnel according to employer policy • 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 • Team operations are monitored to ensure that employer/client needs, and requirements are met • Follow-up communication is provided on all issues affecting the team • All relevant documentation is completed in accordance with company procedures	• Performance Coaching Performance management • Performance Issues	• Communication skills required for leading teams • Coaching skill

RANGE OF VARIABLESs

VARIABLE	RANGE
1. Work requirements	May include: 1.1 Client Profile 1.2 Assignment instructions
2. Team member's concerns	May include: 1.1 Roster/shift details
3. Monitor performance	May include: 2.1 Formal process 2.2 Informal process
4. Feedback	May include: 2.3 Formal process 2.4 Informal process
5. Performance issues	May include: 2.5 Work output 2.6 Work quality 2.7 Team participation 2.8 Compliance with workplace protocols 2.9 Safety 2.10 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 should 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 in this unit may be assessed through: 3.1 Written Examination 3.2 Oral Questioning 3.3 Portfolio
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : **APPLY CRITICAL THINKING AND PROBLEM-SOLVING TECHNIQUES IN THE WORKPLACE**

UNIT CODE : **400311321**

UNIT DESCRIPTOR : This unit 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/s of specific problems in the workplace.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Examine specific workplace challenges	• Variances are examined from normal operating **parameters,** and product quality. • Extent, cause, and nature of the specific problem are defined through observation, investigation, and ***analytical techniques***. • ***Problems*** are clearly stated and specified.	• Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations. • Competence to include the ability to apply and explain, enough for the identification of fundamental causes of specific workplace challenges. • Relevant equipment and operational processes. • Enterprise goals, targets, and measures. • Enterprise quality OHS and environmental requirement. • Enterprise information systems and data collation	• Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. • Identifying extent and causes of specific challenges in the workplace.

		• Industry codes and standards.	
2. Analyze the causes of specific workplace challenges.	• Possible causes of specific problems are identified based on experience and the use of problem-solving tools / analytical techniques. • Possible cause statements are developed based on findings. • Fundamental causes are identified per results of investigation conducted.	• Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations. • Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations. • Relevant equipment and operational processes. • Enterprise goals, targets, and measures. • Enterprise quality OSH and environmental requirement. • Enterprise information systems and data collation. • Industry codes and standards.	• Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. • Identifying extent and causes of specific challenges in the workplace. • Providing clear-cut findings on the nature of each identified workplace challenges.

3. Formulate resolutions to specific workplace challenges	• All possible options are considered for resolution of the problem. • Strengths and weaknesses of possible options are considered. • Corrective actions are determined to resolve the problem and possible future causes. • ***Action plans*** are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures	• Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations • Relevant equipment and operational processes • Enterprise goals, targets, and measures • Enterprise quality OSH and environmental requirement • Principles of decision-making strategies and techniques • Enterprise information systems and data collation • Industry codes and standards	• Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. • Identifying extent and causes of specific challenges in the workplace. • Providing clear-cut findings on the nature of each identified workplace challenges. • Devising, communicating , implementing, and evaluating strategies and techniques in addressing specific workplace challenges.
4. Implement action plans and communicate results	• Action plans are implemented and evaluated. • Results of plan implementation and recommendations are prepared. • Recommendations are presented to appropriate personnel. • Recommendations are followed-up, if required.	• Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations • Relevant equipment and operational processes • Enterprise goals, targets, and measures	• Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. • Identifying extent and causes of specific challenges in the workplace.

		• Enterprise quality, OSH, and environmental requirement • Principles of decision-making strategies and techniques • Enterprise information systems and data collation • Industry codes and standards	• Providing clear-cut findings on the nature of each identified workplace challenges. • Devising, communicating, implementing, and evaluating strategies and techniques in addressing specific workplace challenges.

RANGE OF VARIABLES

VARIABLES	RANGE
1. Parameters	May include: 1.1 Processes 1.2 Procedures 1.3 Systems
2. Analytical techniques	May include: 2.1 Brainstorming 2.2 Intuitions/Logic 2.3 Cause and effect diagrams 2.4 Pareto analysis 2.5 SWOT analysis 2.6 Gantt chart, PERT CPM, and graphs 2.7 Scattergrams
3. Problem	May include: 3.1 Routine, non – routine and complex workplace and quality problems 3.2 Equipment selection, availability, and failure 3.3 Teamwork and work allocation problem 3.4 Safety and emergency situations and incidents 3.5 Risk assessment and management
4. Action plans	May include: 4.1 Priority requirements 4.2 Measurable objectives 4.3 Resource requirements 4.4 Timelines 4.5 Co-ordination and feedback requirements 4.6 Safety requirements 4.7 Risk assessment 4.8 Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Examined specific workplace challenges. 1.2 Analyzed the causes of specific workplace challenges. 1.3 Formulated resolutions to specific workplace challenges. 1.4 Implemented action plans and communicated results on specific workplace challenges.
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 in this unit may be assessed through: 3.1 Observation 3.2 Case Formulation 3.3 Life Narrative Inquiry 3.4 Standardized test 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. These assessment activities should include a range of problems, including new, unusual, and improbable situations that may have happened.
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 : WORK IN A DIVERSE ENVIRONMENT

UNIT CODE : 400311322

UNIT DESCRIPTOR : This unit covers the outcomes required to work effectively in a workplace characterized by diversity in terms of religions, beliefs, races, ethnicities, and other differences.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop an individual's cultural awareness and sensitivity	• Individual differences with clients, customers and fellow workers are recognized and respected in accordance with enterprise policies and core values. • Differences are responded to in a sensitive and considerate manner • ***Diversity*** is accommodated using appropriate verbal and non-verbal communication.	• Understanding cultural diversity in the workplace • Norms of behavior for interacting and dialogue with specific groups (e. g., Muslims and other non-Christians, non-Catholics, tribes/ethnic groups, foreigners) • Different methods of verbal and non-verbal communication in a multicultural setting	• Applying cross-cultural communication skills (i.e., different business customs, beliefs, communication strategies) • Showing affective skills – establishing rapport and empathy, understanding, etc. • Demonstrating openness and flexibility in communication • Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions, and practices
2. Work effectively in an environment that acknowledges and values cultural diversity	• Knowledge, skills, and experiences of others are recognized and documented in relation to team objectives. • Fellow workers are encouraged to utilize and share their specific qualities, skills or backgrounds with other	• Value of diversity in the economy and society in terms of Workforce development • Importance of inclusiveness in a diverse environment	• Demonstrating cross-cultural communication skills and active listening • Recognizing diverse groups in the workplace and community as defined by

	team members and clients to enhance work outcomes. • Relations with customers and clients are maintained to show that diversity is valued by the business.	• Shared vision and understanding of and commitment to team, departmental, and organizational goals, and objectives • Strategies for customer service excellence	divergent culture, religion, traditions, and practices • Demonstrating collaboration skills • Exhibiting customer service excellence
3. Identify common issues in a multicultural and diverse environment	• ***Diversity-related conflicts*** within the workplace are effectively addressed and resolved. • Discriminatory behaviors towards customers/stakeholders are minimized and addressed accordingly. • Change management policies are in place within the organization.	• Value, and leverage of cultural diversity • Inclusivity and conflict resolution • Workplace harassment • Change management and ways to overcome resistance to change • Advanced strategies for customer service excellence	• Addressing diversity-related conflicts in the workplace • Eliminating discriminatory behavior towards customers and co-workers • Utilizing change management policies in the workplace

RANGE OF VARIABLES

VARIABLE	RANGE
1. Diversity	This refers to diversity in both the workplace and the community and may include divergence in : 1.1 Religion 1.2 Ethnicity, race, or nationality 1.3 Culture 1.4 Gender, age, or personality 1.5 Educational background
2. Diversity-related conflicts	May include conflicts that result from: 2.1 Discriminatory behaviors 2.2 Differences of cultural practices 2.3 Differences of belief and value systems 2.4 Gender-based violence 2.5 Workplace bullying 2.6 Corporate jealousy 2.7 Language barriers 2.8 Individuals being differently abled persons 2.9 Ageism (negative attitude and behavior towards old people)

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate**: 1.1 Adjusted language and behavior as required by interactions with diversity 1.2 Identified and respected individual differences in colleagues, clients, and customers 1.3 Applied relevant regulations, standards, and codes of practice
2. Resource Implications	**The following resources should be provided:** 2.1 Access to workplace and resources 2.2 Manuals and policies on Workplace Diversity
3. Methods of Assessment	**Competency in this unit may be assessed through**: 3.1 Demonstration or simulation with oral questioning 3.2 Group discussions and interactive activities 3.3 Case studies/problems involving workplace diversity issues 3.4 Third-party report 3.5 Written examination 3.6 Role Plays
4. Context for Assessment	Competency assessment may occur in workplace or any appropriately simulated environment

UNIT OF COMPETENCY : **PROPOSE METHODS OF APPLYING LEARNING AND INNOVATION IN THE ORGANIZATION**

UNIT CODE : **400311323**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to assess general obstacles in the application of learning and innovation in the organization and to propose practical methods of such in addressing organizational challenges.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess work procedures, processes, and systems in terms of innovative practices	• ***Reasons*** for innovation are incorporated to work procedures. • ***Models of innovation*** are researched. • ***Gaps or barriers*** to innovation in one's work area are analyzed. • Staff who can support and foster innovation in the work procedure are identified.	• Seven habits of highly effective people. • Character strengths that foster innovation and learning (Christopher Peterson and Martin Seligman, 2004) • Five minds of the future concepts (Gardner, 2007). • Adaptation concepts in neuroscience (Merzenich, 2013). • Transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	• Demonstrating collaboration and networking skills. • Applying basic research and evaluation skills • Generating insights on how to improve organizational procedures, processes, and systems through innovation.

2. Generate practical action plans for improving work procedures, processes	• Ideas for innovative work procedure to foster innovation using individual and group techniques are conceptualized • Range of ideas with other team members and colleagues are evaluated and discussed • Work procedures and processes subject to change are selected based on ***workplace requirements*** (feasible and innovative). • Practical action plans are proposed to facilitate simple changes in the work procedures, processes, and systems. • ***Critical inquiry*** is applied and used to facilitate discourse on adjustments in the simple work procedures, processes, and systems.	• Seven habits of highly effective people. • Character strengths that foster innovation and learning (Christopher Peterson and Martin Seligman, 2004) • Five minds of the future concepts (Gardner, 2007). • Adaptation concepts in neuroscience (Merzenich, 2013). • Transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	• Assessing readiness for change on simple work procedures, processes, and systems. • Generating insights on how to improve organizational procedures, processes, and systems through innovation. • Facilitating action plans on how to apply innovative procedures in the organization.

3. Evaluate the effectiveness of the proposed action plans	• Work structure is analyzed to identify the impact of the new work procedures • Co-workers/key personnel is consulted to know who will be involved with or affected by the work procedure • Work instruction operational plan of the new work procedure is developed and evaluated. • Feedback and suggestion are recorded. • Operational plan is updated. • Results and impact on the developed work instructions are reviewed • Results of the new work procedure are evaluated • Adjustments are recommended based on results gathered	• Five minds of the future concepts (Gardner, 2007). • Adaptation concepts in neuroscience (Merzenich, 2013). • Transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	• Generating insights on how to improve organizational procedures, processes, and systems through innovation. • Facilitating action plans on how to apply innovative procedures in the organization. • Communicating results of the evaluation of the proposed and implemented changes in the workplace procedures and systems. • Developing action plans for continuous improvement on the basic systems, processes, and procedures in the organization.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Reasons	May include: 1.1 Strengths and weaknesses of the current systems, processes, and procedures. 1.2 Opportunities and threats of the current systems, processes, and procedures.
2. Models of innovation	May include: 2.1 Seven habits of highly effective people. 2.2 Five minds of the future concepts (Gardner, 2007). 2.3 Neuroplasticity and adaptation strategies.
3. Workplace requirements	May include: 3.1 Feasible 3.2 Innovative

4. Gaps or barriers	May include: 4.1 Machine 4.2 Manpower 4.3 Methods 4.4 Money
5. Critical Inquiry	May include: 5.1 Preparation. 5.2 Discussion. 5.3 Clarification of goals. 5.4 Negotiate towards a Win-Win outcome. 5.5 Agreement. 5.6 Implementation of a course of action. 5.7 Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 5.8 Listening. 5.9 Reducing misunderstandings is a key part of effective negotiation. 5.10 Rapport Building. 5.11 Problem Solving. 5.12 Decision Making. 5.13 Assertiveness. 5.14 Dealing with Difficult Situations.

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Established the reasons why innovative systems are required 1.2 Established the goals of a new innovative system 1.3 Analyzed current organizational systems to identify gaps and barriers to innovation. 1.4 Assessed work procedures, processes, and systems in terms of innovative practices. 1.5 Generated practical action plans for improving work procedures, and processes. 1.6 Reviewed the trial innovative work system and adjusted reflect evaluation feedback, knowledge management systems and future planning. 1.7 Evaluated the effectiveness of the proposed action plans.
2. Resource Implications	The following resources should be provided: 2.1 Pens, papers and writing implements 2.2 Cartolina 2.3 Manila papers
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Psychological and behavioral Interviews. 3.2 Performance Evaluation. 3.3 Life Narrative Inquiry. 3.4 Review of portfolios of evidence and third-party workplace reports of on-the-job performance. 3.5 Sensitivity analysis. 3.6 Organizational analysis. 3.7 Standardized assessment of character strengths and virtues applied.

4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : USE INFORMATION SYSTEMATICALLY

UNIT CODE : 400311324

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use technical information systems, apply information technology (IT) systems, and edit, format & check information.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Use technical information	• ***Information*** is collated and organized into a suitable form for reference and use • Stored information is classified so that it can be quickly identified and retrieved when needed • Guidance is advised and offered to people who need to find and use information	• Application in collating information • Procedures for inputting, maintaining, and archiving information • Guidance to people who need to find and use information • Organize information • classify stored information for identification and retrieval • Operate the technical information system by using agreed procedures	• Collating information • Operating appropriate and valid procedures for inputting, maintaining, and archiving information • Advising and offering guidance to people who need to find and use information • Organizing information into a suitable form for reference and use • Classifying stored information for identification and retrieval • Operating the technical information system by using agreed procedures
2. Apply information technology (IT)	• ***Technical information*** system is operated using agreed procedures • Appropriate and valid procedures are operated for inputting, maintaining, and archiving information	• Attributes and limitations of available software tools • Procedures and work instructions for the use of IT	• Identifying attributes and limitations of available software tools • Using procedures and work

	• ***Software*** required are utilized to execute the project activities • Information and data obtained are handled, edited, formatted, and checked from a range of internal and external ***sources*** • Information is extracted, entered, and processed to produce the outputs required by ***customers*** • Own skills and understanding are shared to help others • Specified ***security measures*** are implemented to protect the confidentiality and integrity of project data held in IT systems	• Operational requirements for IT systems • Sources and flow paths of data • Security systems and measures that can be used • Extract data and format reports • Methods of entering and processing information • WWW enabled applications	instructions for the use of IT • Describing operational requirements for IT systems • Identifying sources and flow paths of data • Determining security systems and measures that can be used • Extracting data and format reports • Describing methods of entering and processing information • Using WWW applications
3. Edit, format and check information	• Basic editing techniques are used • Accuracy of documents are checked • Editing and formatting tools and techniques are used for more complex documents • Proof reading techniques is used to check that documents look professional	• Basic file-handling techniques • Techniques in checking documents • Techniques in editing and formatting • Proof reading techniques	• Using basic file-handling techniques is used for the software • Using different techniques in checking documents • Applying editing and formatting techniques • Applying proof reading techniques

RANGE OF VARIABLES

VARIABLE	RANGE
1. Information	May include: 1.1 Property 1.2 Organizational 1.3 Technical reference
2. Technical information	May include: 2.1 Paper based 2.2 Electronic
3. Software	May include: 3.1 Spreadsheets Databases 3.2 Word processing 3.3 Presentation
4. Sources	May include: 4.1 Other IT systems 4.2 Manually created 4.3 Within own organization 4.4 Outside own organization 4.5 Geographically remote
5. Customers	May include: 5.1 Colleagues 5.2 Company and project management 5.3 Clients
6. Security measures	May include: 6.1 Access rights to input 6.2 Passwords 6.3 Access rights to outputs 6.4 Data consistency and back-up 6.5 Recovery plans

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Used technical information systems and information technology 1.2 Applied information technology (IT) systems 1.3 Edited, formatted, and checked information
2. Resource Implications	The following resources should be provided: 2.1 Computers 2.2 Software and IT system
3. Methods of Assessment	Competency in this unit MUST be assessed through: 3.1 Direct Observation 3.2 Oral interview and written test
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : EVALUATE OCCUPATIONAL SAFETY AND HEALTH WORK PRACTICES

UNIT CODE : 400311325

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to interpret Occupational Safety and Health practices, set OSH work targets, and evaluate effectiveness of Occupational Safety and Health work instructions

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret Occupational Safety and Health practices	• ***OSH work practices issues*** are identified relevant to work requirements • OSH work standards and procedures are determined based on applicability to nature of work • Gaps in work practices are identified related to relevant OSH work standards	• OSH work practices issues • OSH work standards • General OSH principles and legislations • Company/ workplace policies/ guidelines • Standards and safety requirements of work process and procedures	• Communication skills • Interpersonal skills • Critical thinking skills • Observation skills
2. Set OSH work targets	• Relevant work information is gathered necessary to determine OSH work targets • ***OSH Indicators*** based on gathered information are agreed upon to measure effectiveness of workplace OSH policies and procedures • Agreed OSH indicators are endorsed for approval from appropriate personnel • ***OSH work instructions*** are received in accordance with workplace policies and procedures*	• OSH work targets • OSH Indicators • OSH work Instructions • Safety and health requirements of tasks • Workplace guidelines on providing feedback on OSH and security concerns • OSH regulations Hazard control Procedures • OSH trainings relevant to work	• Communication skills • Collaborating skills • Critical thinking skills • Observation skills

3. Evaluate effectiveness of Occupational Safety and Health work instructions	• OSH Practices are observed based on workplace standards • Observed OSH practices are measured against approved ***OSH metrics*** • Findings regarding effectiveness are assessed and gaps identified are implemented based on OSH work standards	• OSH Practices • OSH metrics • OSH Evaluation Techniques • OSH work standards	• Critical thinking skills • Evaluating skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Work Practices Issues	May include: 1.1 Workers' experience/observance on presence of work hazards 1.2 Unsafe/unhealthy administrative arrangements (prolonged work hours, no break-time, constant overtime, scheduling of tasks) 1.3 Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/ guidelines
2. OSH Indicators	May include: 2.1 Increased of incidents of accidents, injuries 2.2 Increased occurrence of sickness or health complaints/symptoms 2.3 Common complaints of workers related to OSH 2.4 High absenteeism for work-related reasons
3. OSH Work Instructions	May include: 3.1 Preventive and control measures**,** and targets 3.2 Eliminate the hazard (i.e., get rid of the dangerous machine 3.3 Isolate the hazard (i.e., keep the machine in a closed room and operate it remotely; barricade an unsafe area off) 3.4 Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one) 3.5 Use administrative controls to reduce the risk (i.e., give trainings on how to use equipment safely; OSH-related topics, issue warning signage's, rotation/shifting work schedule) 3.6 Use engineering controls to reduce the risk (i.e., use safety guards to machine) 3.7 Use personal protective equipment 3.8 Safety, Health and Work Environment Evaluation 3.9 Periodic and/or special medical examinations of workers

4. OSH metrics	May include: 4.1 Statistics on incidence of accidence and injuries 4.2 Morbidity (Type and Number of Sickness) 4.3 Mortality (Cause and Number of Deaths) 4.4 Accident Rate

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identify OSH work practices issue relevant to work requirements 1.2 Identify gaps in work practices related to relevant OSH work standards 1.3 Agree upon OSH Indicators based on gathered information to measure effectiveness of workplace OSH policies and procedures 1.4 Receive OSH work instructions in accordance with workplace policies and procedures 1.5 Compare Observed OSH practices with against approved OSH work instructions 1.6 Assess findings regarding effectiveness based on OSH work standards
2. Resource Implications	The following resources should be provided: 2.1 Facilities, materials, tools, and equipment necessary for the activity
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Observation/Demonstration with oral questioning 3.2 Third party report 3.3 Written exam
4. Context for Assessment	4.1 Competency may be assessed in the workplace or in a simulated workplace setting.

UNIT OF COMPETENCY : EVALUATE ENVIRONMENTAL WORK PRACTICES

UNIT CODE : 400311326

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitude to interpret environmental Issues, establish targets to evaluate environmental practices and evaluate effectiveness of environmental practices

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret environmental practices, policies, and procedures	• ***Environmental work practices*** issues are identified relevant to work requirements • Environmental Standards and Procedures nature of work are determined based on Applicability to nature of work • Gaps in work practices related to Environmental Standards and Procedures are identified	• Environmental Issues • Environmental Work Procedures • Environmental Laws • Environmental Hazardous and Non-Hazardous Materials • Environmental required license, registration, or certification	• Analyzing Environmental Issues and Concerns • Critical Thinking • Problem Solving • Observation Skills
2. Establish targets to evaluate environmental practices	• Relevant information is gathered necessary to determine environmental work targets • ***Environmental Indicators*** based on gathered information are set to measure environmental work targets • Indicators are verified with appropriate personnel	• Environmental Indicators • Relevant Environment Personnel or Expert • Relevant Environmental Trainings and Seminars	• Investigative Skills • Critical thinking • Problem Solving • Observation Skills
3. Evaluate effectiveness of environmental practices	• Work environmental practices are recorded based on workplace standards • Recorded work environmental practices are compared against planned indicators • Findings regarding effectiveness are assessed and gaps identified are implemented	• Environmental Practices • Environmental Standards and Procedures	• Documentation and Record Keeping Skills • Critical thinking • Problem Solving • Observation Skills

	based on environment work standards and procedures • Results of environmental assessment are conveyed to appropriate personnel		

RANGE OF VARIABLES

VARIABLE	RANGE
1. Environmental Practices Issues	May include: 1.1 Water Quality 1.2 National and Local Government Issues 1.3 Safety 1.4 Endangered Species 1.5 Noise 1.6 Air Quality 1.7 Historic 1.8 Waste 1.9 Cultural
2. Environmental Indicators	May include: 2.1 Noise level 2.2 Lighting (Lumens) 2.3 Air Quality - Toxicity 2.4 Thermal Comfort 2.5 Vibration 2.6 Radiation 2.7 Quantity of the Resources 2.8 Volume

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified environmental issues relevant to work requirements 1.2 Identified gaps in work practices related to Environmental Standards and Procedures 1.3 Gathered relevant information necessary to determine environmental work targets 1.4 Set environmental indicators based on gathered information to measure environmental work targets 1.5 Recorded work environmental practices are recorded based on workplace standards 1.6 Conveyed results of environmental assessment to appropriate personnel
2. Resource Implications	The following resources should be provided: 2.1 Workplace/Assessment location 2.2 Legislation, policies, procedures, protocols, and local ordinances relating to environmental protection 2.3 Case studies/scenarios relating to environmental protection

3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Written/ Oral Examination 3.2 Interview/Third Party Reports 3.3 Portfolio (citations/awards from GOs and NGOs, certificate of training – local and abroad) 3.4 Simulations and role-plays
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA center.

UNIT OF COMPETENCY : **FACILITATE ENTREPRENEURIAL SKILLS FOR MICRO-SMALL-MEDIUM ENTERPRISES (MSMEs)**

UNIT CODE : **400311327**

UNIT DESCRIPTOR : This unit covers the outcomes required to build, operate, and grow a micro/small-scale enterprise.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop and maintain micro-small-medium enterprise (MSMEs) skills in the organization	• Appropriate ***business strategies*** are determined and set for the enterprise based on current and emerging business environment. • ***Business operations*** are monitored and controlled following established procedures. • Quality assurance measures are implemented consistently. • Good relations are maintained with staff/workers. • Policies and procedures on occupational safety and health and environmental concerns are constantly observed.	• Business models and strategies • Types and categories of businesses • Business operation • Basic Bookkeeping • Business internal controls • Basic quality control and assurance concepts • Government and regulatory processes	• Basic bookkeeping/ accounting skills • Communication skills • Building relations with customer and employees • Building competitive advantage of the enterprise
2. Establish and Maintain client-base/market	• Good customer relations are maintained • New customers and markets are identified, explored, and reached out to. • Promotions/Incentives are offered to loyal customers • Additional products and services are evaluated and tried where feasible. • ***Promotional/advertising initiatives*** are carried out where necessary and feasible.	• Public relations concepts • Basic product promotion strategies • Basic market and feasibility studies • Basic business ethics	• Building customer relations • Individual marketing skills • Using basic advertising (posters/ tarpaulins, flyers, social media, etc.)
3. Apply budgeting and financial management skills	• Enterprise is built up and sustained through	• Cash flow management • Basic financial management	• Setting business priorities and strategies

	judicious control of cash flows. • Profitability of enterprise is ensured though appropriate ***internal controls***. • Unnecessary or lower-priority expenses and purchases are avoided.	• Basic financial accounting • Business internal controls	• Interpreting basic financial statements • Preparing business plans

RANGE OF VARIABLES

VARIABLE	RANGE
1. Business strategies	May include: 1.1 Developing/Maintaining niche market 1.2 Use of organic/healthy ingredients 1.3 Environment-friendly and sustainable practices 1.4 Offering both affordable and high-quality products and services 1.5 Promotion and marketing strategies (e. g., on-line marketing)
2. Business operations	May include: 2.1 Purchasing 2.2 Accounting/Administrative work 2.3 Production/Operations/Sales
3. Internal controls	May include: 3.1 Accounting systems 3.2 Financial statements/reports 3.3 Cash management
4. Promotional/Advertising initiatives	May include: 4.1 Use of tarpaulins, brochures, and/or flyers 4.2 Sales, discounts, and easy payment terms 4.3 Use of social media/Internet 4.4 "Service with a smile" 4.5 Extra attention to regular customers

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Demonstrated basic entrepreneurial skills 1.2 Demonstrated ability to conceptualize and plan a micro/small enterprise 1.3 Demonstrated ability to manage/operate a micro/small-scale business
2. Resource Implications	The following resources should be provided: 2.1 Simulated or actual workplace 2.2 Tools, materials, and supplies needed to demonstrate the required tasks 2.3 References and manuals

3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Written examination 3.2 Demonstration/observation with oral questioning 3.3 Portfolio assessment with interview 3.4 Case problems
4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

COMMON COMPETENCIES

UNIT TITLE : **APPLY ENERGY MANAGEMENT SYSTEM STANDARDS**

UNIT CODE : **UTL311208**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to implement, monitor, and manage energy consumption thru the implementation of Energy Management Systems following the ISO 50001 principles and standards. This would entail energy management systems training that include continuous improvement of processes, and documentation which is all geared towards energy efficiency and conservation. It involves data collection and keeping accurate and complete records and documentation.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Access information concerning energy management systems, energy efficiency programs and policies	• Relevant provisions of energy management related regulations and issuances from DOE environmental legislation and codes of practice are accurately followed • Information on workplace energy management policies, procedures and programs is stored in a readily accessible location and manner • ***Information*** is accurately and clearly explained to the work team • Information about the outcomes of energy management systems, identification and control procedures is provided to the ***appropriate personnel***	• Relevant Energy Laws and Energy Management and Energy Efficiency related circulars, issuances, and programs • Company's Energy management system policies, initiatives, process, and procedures. • Energy efficiency standards required in the workplace	• Workplace reporting and recording processes and procedures • Communication skills • Accessing information and data • Ability to recognize potential increase in energy consumption and identifying ways of minimizing them.
2. Implement and monitor procedures concerning energy usage	• Existing and potential ***areas for energy savings*** in the workplace are identified and reported • Identified priority energy consuming devices/ equipment are assessed in	• Relevant energy management related laws and regulations & codes of practice in the	• Workplace reporting and recording processes and procedures • Communication skills

	relation to relevant energy consumption baseline or standards • ***Workplace procedures*** dealing with energy intensive processes are implemented wherever necessary to ensure that prompt control action is taken to ensure efficiency measures	area of Energy Efficiency and Energy Conservation • Company's energy policy, process, procedures, and guidelines for implementing and monitoring EnMS • Equipment and resources required when implementing and monitoring energy conservation measures. Organizational structure and site layout should be made clear and available.	• Problem solving skills • Ability to recognize potential energy savings in the workplace • Counseling, advising, and informing others on energy conservation matters • Identifying and correctly using equipment and vehicles in accordance with energy conservation measures (ECM)
3. Implement and monitor energy management procedures following the PDCA cycle	• Existing energy efficiency measures are implemented, monitored, and reviewed • Work procedures to implement energy management systems and energy conservation measures are implemented and adherence to them by the work group is monitored • Required improvements to existing control measures are identified, including required resources for implementation, and reported to appropriate personnel	• Relevant energy management and energy conservation related regulations & codes of practice are in place. • Company's energy policy, process and procedures and guidelines for implementing and monitoring EnMS. • Equipment and resources required when implementing and monitoring Energy Management Systems control procedures	• Workplace reporting and recording processes and procedures • Communication skills • Accessing information and data • Problem solving skills • Ability to counsel, advise and inform others on environmental control procedures • identifying and correctly using equipment and vehicles in accordance with environmental control procedures,

		• Organizational structure and site layout	regulations, and guidelines

RANGE OF VARIABLES

VARIABLE	RANGE
1 Information	Information/documents may include: 1.1 Workplace procedures and practices related to energy consumption, including all financial, operating and customer service policies and procedures 1.2 Occupational Health & Safety 1.3 Regulations for Compliance 1.4 Workplace housekeeping procedures and policies 1.5 Code of practice for energy management system 1.6 Policies and procedures for equipment and devices used in the workspace 1.7 Manufacturer's instructions concerning the use and servicing of equipment 1.8 Plans, Objectives and Targets 1.9 Documentation, Review 1.10 Monitoring and Control 1.11 Checking for Corrective Actions 1.12 Management Review
2 Appropriate personnel	Appropriate personnel may include: 2.1 Workplace personnel including supervisors and management 2.2 Site Engineers 2.3 Contractors 2.4 Operators and Maintenance personnel
3 Areas for energy saving (Energy Cost Centers)	Energy Cost Centers may include: 3.1 Administration Building 3.2 Production area 3.3 Packaging Area 3.4 HVAC Systems 3.5 Power Generation
4 Workplace procedures	Workplace procedures for Energy Intensive Processes may include: 4.1 Inspection and housekeeping 4.2 Maintenance including plant and equipment 4.3 Measurement and Monitoring System 4.4 Operational instruction on Phantom load detection 4.5 Energy Usage Peak and Off-Peak Hours

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Accessed information concerning Energy management systems, Energy efficiency programs and policies 1.2 Implemented and monitored procedures concerning energy usage 1.3 Implemented and monitored energy management procedures following the PDCA cycle
2. Resource implications	The following resources should be provided: 2.1 Energy Management Systems procedural manual and trainings. 2.2 Energy Laws and Regulations on Energy Efficiency and Energy Conservation 2.3 Appropriate energy measuring equipment 2.4 Applicable PPE 2.5 Appropriate installation tools (i.e., pliers, screwdrivers, etc.) 2.6 Workplace or assessment area
3. Methods of assessment	Competency in this unit may be assessed through: 3.1 Direct evaluation of energy management performance monitoring and control 3.2 Demonstration/Observation with oral questioning 3.3 Written test 3.4 Use of methods of measurements and verification for the implementation of energy efficiency and conservation projects
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.

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	• Relevant provisions of environmental legislation and codes of practice are accurately followed • Information on workplace environmental policies, procedures and programs is stored in a readily accessible location and manner • ***Information*** is accurately and clearly explained to the work team and updated according to change in workplace policy • Information about the outcomes of environmental risk identification and control procedures is provided to the appropriate personnel	• Relevant environmental protection regulations & codes of practice • Environmental risks associated with workplace operations and related precautions to control the risk • Environmental protection standards required in the workplace	• Workplace reporting and recording processes and procedures • Communication skills • Accessing information and data • Ability to recognize potential environmental risks and ways of minimizing them
2. Implement and monitor procedures concerning environmental hazards	• Existing and potential ***environmental hazards*** in the workplace are identified and reported • Identified hazards are assessed in relation to relevant environmental protection policies • ***Workplace procedures for dealing with hazardous events*** are implemented wherever necessary to ensure that	• Relevant environmental protection regulations & codes of practice • Workplace procedures and guidelines for implementing and monitoring procedures concerning	• ISO 50001 or any similar framework • Workplace reporting and recording processes and procedures • Communication skills • Problem solving skills • Ability to:

	prompt control action is taken • ***Personal protective equipment (PPE)*** is obtained and used in accordance with job requirements • Hazardous events are investigated to identify causes, and control measures are implemented to prevent recurrence and minimize risks of such events	environmental hazards • Workplace environmental hazards and related hazard control measures • Equipment and resources required when implementing and monitoring environmental protection procedures • Organizational structure and site layout	• recognize potential environmental hazards and ways of minimizing them • counsel, advise and inform others on environmental protection matters • identify and correctly use equipment and vehicles in accordance with environmental protection regulations and guidelines
3. Implement and monitor environmental control procedures	• Existing environmental protection measures are implemented, monitored, and reviewed • Work procedures to protect environment are implemented and adherence to them by the work group is monitored • Required improvements to existing control measures are identified, including required resources for implementation, and reported to appropriate personnel	• Relevant environmental protection regulations & codes of practice • Workplace procedures and guidelines for implementing and monitoring environmental control procedures • Equipment and resources required when implementing and monitoring environmental control procedures • Organizational structure and site layout	• PDCA cycle or any similar framework • Workplace reporting and recording processes and procedures • Communication skills • Accessing information and data • Problem solving skills • Ability to: • Counsel, advise and inform others on environmental control procedures • 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

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	• Appropriate manuals are identified and accessed as per job requirements • Version and date of manual are checked to ensure that correct specification and procedures are identified	• Types of manuals used in energy consumption • Identification of symbols used in the manuals	• Reading and comprehension skills • Identifying and interpreting energy consumption manuals and specifications • Accessing information and data
2. Interpret manuals	• Relevant sections, chapters of specifications/ manuals are located in relation to the work to be conducted • Information and procedure in the manual are interpreted in accordance with industry practices	• Types of manuals used in energy consumption • Types of symbols used in manuals • Identification of units of measurements • Unit conversion	• Reading and comprehension skills • Identifying and interpreting energy consumption manuals and specifications • Accessing information and data • Applying conversion of units of measurements
3. Apply information in manual	• ***Manual*** is interpreted according to job requirements • Work steps are correctly identified in accordance with manufacturer's specification • Manual data are applied according to the given task • All correct sequencing and adjustments are interpreted in accordance	• Types of manuals used in energy consumption • Types and application of symbols used in the manuals • Unit conversion	• Reading and comprehension skills • Applying information from manuals

	with information contained on the manual or specifications		
4. Store manuals	• Manual or specification is stored appropriately to prevent damage, ready access and updating of information when required in accordance with company requirements	• Types of manuals used in energy consumption • Manual storing and maintaining procedures	• Reading and comprehension skills • 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 3.3 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 TOOLS AND EQUIPMENT

UNIT CODE : UTL311205

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitude to operate and maintain 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	• Work instruction is secured and interpreted according to job requirements • Relevant ***occupational health and safety requirements*** are identified following job specifications • Relevant transmission line ***tools, equipment and hardware*** are identified and requested in accordance with job specifications	• Relevant occupational health and safety standards • Types and usage of tools and equipment • Basic preventive maintenance servicing for equipment	• Following and complying occupational health and safety standards • Following procedures for the safe use of tools and equipment • Performing basic preventive maintenance servicing for equipment
2. Prepare tools and equipment	• Personal protective equipment (PPE) is obtained following job requirements • Tools, equipment, and hardware are acquired and secured in line with job requirements • Tools are tested/set following manufacturer's standards or recommendation	• Types and functions of PPEs • Types and usage of tools and equipment • Basic preventive maintenance servicing for equipment • Proper testing of tools	• Following and complying occupational health and safety standards • Following procedures for the safe use of tools and equipment • Performing basic preventive maintenance servicing for equipment • Testing skills
3. Operate tools and equipment	• PPE are used in line with job requirements • Tools and equipment are used in line with job requirements	• Proper usage of PPEs • Proper procedure for the use of tools and equipment • Basic preventive maintenance servicing for equipment	• Using PPEs • Following procedures for the safe use of tools and equipment • Performing basic preventive maintenance servicing for equipment

4. Check condition of tools and equipment	• Tools and equipment are identified according to classification and job requirements • Non-functional tools and equipment are segregated and labeled according to classification • Safety of tools and equipment are observed in accordance with manufacturer's instructions • Condition of PPE are checked in accordance with manufacturer's instructions	• Classification of tools and equipment • Proper safety procedure for the use of tools and equipment • Basic preventive maintenance servicing for equipment	• Classifying tools and equipment • Following and complying occupational health and safety standards • Following procedures for the safe use of tools and equipment • Performing basic preventive maintenance servicing for equipment
5. Perform basic preventive maintenance	• Appropriate lubricants are identified according to types of equipment • Equipment is lubricated according to preventive maintenance schedule or manufacturer's specifications • Tools are cleaned and tested according to standard procedures • Tools and equipment are inspected, and repaired and replaced, if necessary, after use • Workplace is cleaned and kept in safe state in line with OHSA regulations	• Types and usage of lubricants for equipment • Proper procedure for the use and maintenance of tools and equipment • Basic preventive maintenance servicing for equipment • Applicable OHSA regulations in preventive maintenance	• Identifying types and usage of lubricants • Following procedures for the safe use and maintenance of tools and equipment • Performing basic preventive maintenance servicing for equipment • Following OHSA regulations
6. Store tools and equipment	• Inventory of tools and equipment are conducted and recorded as per company practices • Tools and equipment are stored safely in appropriate locations in accordance with manufacturer's specifications or company procedures	• Proper procedure for the inventory and storage of tools and equipment	• Following procedures for the inventory and storage of tools and equipment • Inventory skills • Proper storage and handling 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 Installation of grounding cluster
2. Tools, equipment, and hardware	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 Auger bit 2.1.6 Hacksaw/cutting tools 2.1.7 Steel tape 2.2 Equipment 2.2.1 Motorized capstan 2.2.2 Climbing gears 2.2.3 Line truck/Boom truck 2.3 Set of hot line trailer 2.4 Hardware 2.4.1 Insulator 2.4.2 Machine bolts 2.4.3 Suspension clamp assembly (ACSR/OHGW) 2.4.4 Strain clamp assembly(ACSR/OHGW) 2.4.5 Overhead ground wires 2.4.6 Cross-arms and braces 2.4.7 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 tools and equipment 1.2 Demonstrates ability to identify and safely use tools and equipment 1.3 Demonstrates ability to perform basic preventive maintenance servicing for equipment
2. Resource Implications	The following resources must be available: 2.1 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	• Requirements of task are determined • Appropriate ***hardware*** and ***software*** are selected according to task assigned and required outcome • Task is planned to ensure ***OH&S guidelines*** and procedures are followed	• Main types of computers and basic features of different operating systems • Main parts of a computer • Information on hardware and software • Data security guidelines	• Reading and comprehension skills required to interpret work instruction and to interpret basic user manuals. • Communication skills to identify lines of communication, request advice, follow instructions and receive feedback. • Interpreting user manuals and security guidelines
2. Input data into computer	• Data are entered into the computer using appropriate program/application in accordance with company procedures • Accuracy of information is checked, and information is saved in accordance with standard operating procedures • Inputted data are stored in ***storage media*** according to requirements • Work is performed within ***ergonomic guidelines***	• Basic ergonomics of keyboard and computer user • Storage devices and basic categories of memory • Relevant types of software	• Technology skills to use equipment safely including keyboard skills. • Entering data

3. Access information using computer/ smartphone	• Correct program/application is selected based on job requirements • Program/application containing the information required is accessed according to company procedures • ***Desktop icons*** are correctly selected, opened and closed for navigation purposes • Keyboard techniques are carried out in line with OH&S requirements for safe use of keyboards	• General security, privacy legislation and copyright • Productivity Application • Business Application	• Accessing information • Searching and browsing files and data
4. Produce/ output data using computer system	• Entered data are processed using appropriate software commands • Data printed out as required using computer hardware/peripheral devices in accordance with standard operating procedures • Files, data are transferred between compatible systems using computer software, hardware/ peripheral devices in accordance with standard operating procedures	• Computer application in printing, scanning, and sending facsimile • Types and function of computer peripheral devices	• Computer data processing • Printing of data • Transferring files and data
5. Maintain computer equipment and systems	• Systems for cleaning, minor ***maintenance*** and replacement of consumables are implemented • Procedures for ensuring security of data, including regular back-ups and virus checks are implemented in accordance with standard operating procedures • Basic file maintenance procedures are implemented in line with the standard operating procedures	• Basic internet operation ○ Web address ○ Types and functions of search engines • Different web browser security features and maintenance	• Locating information using browser • 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 : **MANAGE ENERGY CONSUMPTION OF FACILITIES, EQUIPMENT AND DEVICES**

UNIT CODE : **UTL741323**

DESCRIPTOR : This unit covers the knowledge, skills and attitude required to provide an appropriate management of energy consumption in the facility and its corresponding equipment and devices. This unit includes competencies in checking current energy consumption of facilities, equipment, and devices; checking appropriate ways to prevent energy consumption increase; performing modification and improvement of settings, processes and behaviors and conducting management review on energy performance.

ELEMENT	PERFORMANCE CRITERIA (*Italicized* terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Check current energy consumption of facilities, equipment, and devices	• Energy consuming facilities, equipment and devices are identified based on assets list, electrical, mechanical, and as-built plan of the premises • Energy consumption of the facilities, equipment and devices are measured and properly ***reported*** • ***High energy consumption detection*** is recorded according to company SOP	• Usage of energy measuring devices • Identification of types of energy consuming equipment and devices and their specifications • Application and usage of equipment and devices • Analysis of Electrical and mechanical plans • Familiarization with Energy Consumption measurement procedures • Basic Math (MDAS) • Written and oral communication	• Using energy measuring instruments • Technical writing skills • Identifying energy consuming equipment and devices • Analytical skills • Communication skills • Interpretation skills • Mathematical skills

2. Check appropriate ways to manage energy consumption and improve efficiency	• Specifications of equipment and devices performance are verified and familiarized based on specifications • Phantom loads, overheating and building envelope are checked according to ***technical reference standards**** • Equipment and devices modification, retrofit, upgrade and similar action are verified against existing ***energy efficiency reference standards**** • Standard usage of facilities, equipment and devices are checked and observed and including the entire processes and control settings	• Up-to-date knowledge of energy efficient technologies • Energy equipment and devices actual performance versus standards or benchmarks • Procedures in checking phantom loads, overheating, and building envelope • Different energy efficiency reference standards in energy consumption Procedures in modification, retrofitting and upgrading energy equipment and devices • Detection and management of proper use of facilities, equipment, and devices • Production and operation processes and control settings	• Detecting and managing proper usage of facilities, equipment, and devices • Using instrumentation for measuring energy consumption • Communication skills • Interpretation skills • Mathematical skills
3. Perform modification and improvement of settings, processes, and behaviors	• Safety protocols are observed based on OSHA* • Analysis and recommendations are made on identified high energy consumption use • Proper modification and improvement of processes/settings and behavior are reviewed and analyzed following standards requirements prior to implementation*	• Safety protocols/ OSHA • Production and operation processes and control settings • Correct and safe modification of energy efficient devices/ equipment	• Analytical skills • Using basic electrical and mechanical tools properly • Communication skills • Interpretation skills

	• Implemented changes are monitored versus change objectives and reported regularly	• Proper usage of basic electrical and mechanical tools	
4. Conduct management review on energy performance	• Energy performance plans versus targets are evaluated according to EnMS* • Performance review and necessary function testing are conducted based on operational and testing procedures* • Deviations, non-conformance are identified based on established targets and objectives* • Action plans to improve performance are recommended based on EnMS	• Familiarity with the operating performance of the installed equipment • Understanding of the systems performance for all related equipment • Company's energy policy, process, and procedures on EnMS	• Interpretation and analysis of data • Using energy related instrument (e.g., clamp meter)

** Critical Aspects of Competency*

RANGE OF VARIABLES

VARIABLE	RANGE
1. Energy consumption report	Energy consumption reporting may include: 1.1 Calculations 1.2 Tabulations 1.3 Graphs 1.4 Data collection
2. High energy consumption detection	High energy consumption detection may include: 2.1 Phantom loads detection 2.2 Overheating/over-used detection 2.3 Energy bill 2.4 Consumption data trends
3. Technical reference standards	Technical reference standards may include: 3.1 efficient lighting standards 3.2 Philippine Electrical Code 3.3 Philippine Mechanical Code 3.4 Guidelines for Energy Conserving Designs for Buildings 3.5 Green Building Code 3.6 Energy Efficiency related policies and department circulars of DOE 3.7 Fire Code of the Philippines 3.8 OSHA 3.9 ASHRAE 3.10 Environmental Code

4. Energy efficiency reference standards	Energy efficiency reference standards may include: 4.1 Guidelines for Energy Conserving Designs for Buildings 4.2 Green Building Code 4.3 Energy Efficiency related policies and department circulars of DOE 4.4 OSHA 4.5 ASHRAE 4.6 ISO 50001

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Checked current energy consumption of facilities, equipment, and devices 1.1.1 Measured and properly reported Energy consumption of the facilities, equipment, and devices 1.1.2 Recorded high energy consumption detection according to company SOP 1.2 Checked appropriate ways to prevent energy consumption increase 1.2.1 Checked phantom loads, overheating, and building envelope according to reference standards 1.2.2 Verified equipment and devices modification, retrofit, upgrade and similar action against existing energy efficiency reference standards 1.3 Performed modification and improvement of settings, processes, and behaviors 1.3.1 Observed safety protocols based on OSHA 1.3.2 Reviewed and analyzed proper modification and improvement of processes/settings and behavior following standards requirements 1.4 Conducted management review on energy performance 1.4.1 Evaluated energy performance plans versus targets according to EnMS 1.4.2 Conducted performance review and necessary function testing based on Energy Management System (EnMS) 1.4.3 Identified deviations, non-conformance based on established targets and objectives
2. Resource implications	The following resources should be provided: 2.1 Appropriate energy measuring equipment and tools 2.2 Applicable PPE 2.3 Appropriate assessment resources 2.4 Workplace or assessment area

	2.5 Legislation, policies, procedures, protocol, and local ordinances relating to energy utilization
3. Method of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Observation with oral questioning 3.2 Written test 3.3 Portfolio
4. Context of assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : PLAN AND SUPPORT THE IMPLEMENTATION OF REGULAR ENERGY AUDIT

UNIT CODE : UTL741324

DESCRIPTOR : This unit covers the knowledge, skills and attitude required to conduct regular energy audit. This unit also includes planning & scheduling and implementing energy audit including developing and recommending strategies for improving energy audit.

ELEMENT	PERFORMANCE CRITERIA (***Italicized Bold*** terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and schedule energy audit	• Audit team is developed through ***capability building methods*** • Audit plan is prepared based on coordination with different divisions/plants* • Final schedule for ***resource requirements*** is approved and communicated*	• Energy audit methodology, principles, process, guidelines, and procedures • Facilities production and operation processes and boundaries • Energy equipment devices specifications • Scope of an Energy Audit • Knowledge of Resources requirement • Selection of Audit method based on recognized need	• Analytical skills • Communication skills • Writing/reporting skills • Coordination and team management skills • Identifying list of data to be collected. • Operate metering equipment • Identifying area to be audited
2. Implement energy audit	• Meeting is conducted in accordance with the energy audit plan* • Data collection and ***measurement*** plan are implemented based on the energy audit plan* • Site inspection is conducted based on energy audit plan • Data are ***analyzed*** using simple statistical tools and	• Energy audit methodology, principles, process, guidelines, and procedures • Facilities production and operation processes and boundaries • Energy equipment	• Analytical skills • Communication skills • Writing/ reporting skills • Coordination and team management skills • Identifying area or equipment to be included in the Audit

	energy auditing techniques* • Reporting and closing are done based on energy audit plan • Conduct of audit are monitored up to closing meeting and made sure audit plan is followed within the time frame	devices specifications • Knowledge about setting of Energy Target and Plan • Analysis of result • Estimates of manpower and budget required • External auditors' proper credentials and track record	• Ensuring complete metering and instrumentation needed
2. Develop and recommend strategies for improving energy efficiency	• ***Strategies*** are developed based on the outcome of the audit findings* • ***Recommendation*** for energy use reduction or energy efficiency improvement strategy is prepared based on the results of the audit* • Recommendation for opportunities for improvement is proposed based on the results of the audit*	• Energy audit methodology, principles, process, guidelines, and procedures • Facilities production and operation processes and boundaries • Energy equipment devices specifications • Target energy reduction check audit recommendations • Assessment on identified opportunities for improvement	• Analytical skills • Communication skills • Writing/ reporting skills • Coordination and team management • Presentation skills • Assisting Audit team and provide needed metering equipment and instrumentation

** Critical Aspects of Competency*

RANGE OF VARIABLES

VARIABLE	RANGE
1. Capability building methods	May include: 1.1 Training and seminars 1.2 Mentoring 1.3 Consulting or hiring third party 1.4 Outsourcing
2. Resource requirements	May include: 2.1 Manpower 2.2 Equipment 2.3 Budgets
3. Analyzed	May include: 3.1 Data analysis and presentation outputs: 3.2 Identify energy performance trends, 3.3 Issues and performance gaps, opportunities for improvement
4. Measure actual use of energy	May include: 4.1 Specific energy consumption (kWh or equivalent) 4.2 Operating Hours 4.3 Energy Baseline Consumption 4.4 Energy baseload 4.5 Energy Efficiency Index (EEI) 4.6 Seasonal variability
5. Strategies	Development of strategies may include: 5.1 Conduct of Level 1 Energy Audit to establish baseline 5.2 Determine actual energy use for the overall process 5.3 Identification of Energy Conserving Measures (ECM) 5.4 Applying fuel substitution when applicable 5.5 Analysis of process, operation, and control setpoints 5.6 Policies and behavioral analysis 5.7 Identification of energy efficient technologies
6. Recommendation	Recommendation for an energy efficiency improvement strategy may include: 6.1 Process and operation control analysis 6.2 Cost-benefit analysis 6.3 Life Cycle Analysis 6.4 Consideration for downtime

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Plan and schedule energy audit 1.1.1 Prepared audit plan based on coordination with different divisions/plants 1.1.2 Approved and communicated final schedule for resource requirements 1.2 Implement energy audit 1.2.1 Conducted meeting is conducted in accordance with the energy audit plan 1.2.2 Implemented data collection and measurement plan based on the energy audit plan 1.2.3 Analyzed data using statistical tools and techniques 1.3 Develop and recommend strategies for improving energy efficiency 1.3.1 Developed strategies based on the outcome of the audit findings 1.3.2 Prepared recommendation for energy use reduction strategy based on the results of the audit 1.3.3 Proposed recommendation for opportunities for improvement based on the results of the audit
2. Resource Implications	The following resources should be provided: 2.1 Appropriate energy measuring equipment 2.2 Applicable PPE 2.3 Appropriate energy audit tools 2.4 Workplace or assessment area: actual place of audit
3. Method of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Observation with oral questioning 3.2 Written test 3.3 Portfolio
4. Context of assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : PERFORM ENERGY CONSUMPTION MONITORING AND CONTROL

UNIT CODE : UTL741325

UNIT DESCRIPTOR : This unit covers the outcomes required for performing energy monitoring and control. This unit includes competencies in conducting data gathering, using measuring tools and instrument panel for monitoring, and analyzing the energy consumption data.

ELEMENT	PERFORMANCE CRITERIA (*Italicized* terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Conduct data gathering	• Checklists and forms are prepared based on required/needed information • Data for energy consumption are gathered based on checklist and forms.* • Data are properly recorded, documented, and stored for future analysis.*	• Understanding of set points parameter • Understanding on the use of test and measuring equipment and devices • Facilities electrical and mechanical plans • Basic Statistics	• Reading and understanding of units of measurements • Data gathering skills • Documentation skills • Communication skills
2. Use measuring tools and Instrument Panel for monitoring	• Measuring tools and instrument panel are prepared for energy consumption monitoring • Measuring tools and instrument panel are used to compared standards versus actual parameters.*	• Understanding of analog and digital instrumentation panels • Facilities electrical and mechanical plans	• Reading and understanding of units of measurements • Data gathering skills • Documentation skills • Communication skills
3. Analyze the energy consumption data	• ***Collected data*** are normalized, analyzed and issues and trends identified • Calibration and adjustment are made based on results of the analysis versus standards and requirements.* • Settings are adjusted based on results of the analysis versus standards and requirements.*	• Basics of electrical controls • Facilities electrical and mechanical plans • Process, operation, and control settings	• Problem solving • Analytical skills • Skill in reading meters and use of instruments • Prepare periodic energy consumption and energy conservation program reports

	• Other action plans are recommended based on the result of the analysis		

** Critical Aspects of Competency*

RANGE OF VARIABLES

VARIABLE	RANGE
1. Collected data	May include: 1.1 Data based on Key Performance Index 1.2 KPI may include capacity 1.3 Other energy data and statistics

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Conducted data gathering 1.1.1 Gathered data for energy consumption based on checklist and forms 1.2.1 Recorded, documented, and stored data properly for future analysis 1.2 Used measuring tools and instrument panel for monitoring 1.2.1 Used measuring tools and instrument panel to compare standards versus actual parameters 1.3 Analyzed the energy consumption data 1.3.1 Made calibration or adjustment based on results of the analysis 1.3.2 Adjusted settings based on the results of the analysis
2 Resource implications	The following resources should be provided: 2.1 Appropriate energy measuring equipment and tools 2.2 Applicable PPE 2.3 Appropriate assessment resources 2.4 Workplace / assessment location 2.5 Legislation, policies, procedures, protocol, and local ordinances relating to energy utilization.
3 Method of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Observation with oral questioning 3.2 Written test 3.3 Portfolio
4 Context of assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : CARRY OUT IMPLEMENTATION AND IMPROVEMENT OF ENERGY EFFICIENCY MEASURES

UNIT CODE : UTL741326

UNIT DESCRIPTOR : This unit covers the outcomes required to carry out implementation and improvement of energy efficiency measures. This unit includes competencies in studying/ selecting appropriate process, systems, and technology, applying appropriate process, systems and technology including operating and maintaining energy production and operation process, system and technology and including applicable EnMS management systems.

ELEMENT	PERFORMANCE CRITERIA (***Italicized Bold*** terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Study/select appropriate process, systems, and technology	• Use of different ***processes, systems and technology*** are evaluated and assessed based on facilities energy performance requirement.* • Appropriate process systems and technology are selected as per evaluation and assessment energy efficiency performance requirements.*	• Understanding of the current process, systems and technology used. • Awareness of new process, system and technology and its functions • Communication techniques • Health and safety procedures • Company policy in relation to relevant technology • Machineries /equipment and their application	• Analytical skills • Writing skills • Communication skills • Market research skills • Identifying relevant energy technology on job • Setting up appropriate energy performance baselines and energy performance indicators • Prepare periodic energy consumption and energy conservation program

2. Apply appropriate process, systems, and technology	• Appropriate and approved process, systems and technology are effectively used in carrying the objectives set.* • Applicable software and hardware are used as per task requirement.* • ***Energy management concepts*** are observed and practiced following best practices on energy efficiency and conservation (EEC) which may pertain to ISO 50001.	• Communication techniques • Knowledge on operating instructions • Understanding software and hardware system • Health and safety procedure • Company policy in relation to relevant EEC technology • Different management concepts • Technology adaptability	• Applying relevant technology • Communication skills • Using software application as needed • Conducting assessment evaluation and post implementation audit
3. Operate and maintain energy production and operation process, system and technology and including applicable EnMS management systems	• Energy production and operation process, and technology support are operated and maintained in accordance with industry ***standard operating procedures***, ***manufacturer's operating guidelines***, and occupational health and safety procedures to ensure reliability and safety.* • Energy production and operation process, systems and technology support are updated through continuing education or training in accordance with job requirements • Failures/defects/variations and non-compliance are immediately reported to the concerned/responsible person or section for ***appropriate action***	• Awareness on EEC technology and its function • Understanding of the company's energy production and operation process, systems, and technology support • Repair and maintenance procedure • Health and safety procedure • Upgrading of technology • Organizational set-up/workflow	• Basic troubleshooting skills • Identifying failures or defects • Communication skills • Applying corrective and preventive maintenance. • Analytical skills • Using of software application as needed • Conducting assessment, evaluation, and post implementation audit

** Critical Aspects of Competency*

RANGE OF VARIABLES

VARIABLE	RANGE
1. Processes, systems, and technology	Energy production and operation process, systems and technology support may include: 1.1 Office technology 1.2 Production & operation process 1.3 Industrial technology 1.4 System technology 1.5 Information technology 1.6 Training technology
2. Management Concepts	May include: 2.1 EnMS (ISO 50001) 2.2 Real time or Just in time (JIT) 2.3 PDCA 2.4 5S 2.5 TQM (ISO 9001, ISO 9002) 2.6 ISO 14001 2.7 Other Management Productivity Tools
3. Standard Operating Procedures	EEC Standard Operating Procedures may include: 3.1 Written guidelines relative to the usage of energy equipment/devices and control systems 3.2 Verbal advise / instruction from the co-worker 3.3 Equipment manual of operation 3.4 Materials Safety data Sheet 3.5 Manufacturer's or Engineering recommended settings
4. Manufacture's operating guidelines / instruction	May include: 4.1 Written instruction / manual of specific EEC technology / equipment 4.2 General instruction manual 4.3 Recommendation from manufacturer relative to the operation of the EEC equipment (documented)
5. Appropriate action	May include: 5.1 Implementing preventive maintenance schedule. 5.2 Coordinating with manufacturer's technician

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Studied/Selected appropriate process, systems, and technology 1.1.1 Evaluated and assessed use of different processes, systems and technology based on facilities energy performance requirement 1.2.1 Selected appropriate process systems and technology as per evaluation and assessment energy efficiency performance requirements 1.2 Applied appropriate process, systems, and technology 1.2.1 Used appropriate and approved process, systems, and technology effectively in carrying the objectives set 1.2.2 Used applicable software and hardware as per task requirement 1.3 Operated and maintained energy production and operation process, system and technology and including applicable EnMS management systems 1.3.1 Operated and maintained energy production and operation process, and technology support in accordance with industry standard operating procedures, manufacturer's operating guidelines, and occupational health and safety procedures to ensure reliability and safety
2 Resource implications	The following resources should be provided: 2.1 Appropriate equipment and tools 2.2 Applicable PPE 2.3 Appropriate assessment resources 2.4 Workplace/ assessment location 2.5 Relevant energy production and operation process, systems, and technology support
3 Method of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/observation with questioning 3.2 Written test 3.3 Portfolio
4 Context of assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : **COORDINATE INVENTORIES AND PURCHASING/ SOURCING OF ENERGY EFFICIENT EQUIPMENT, DEVICES OR SERVICES**

UNIT CODE : **UTL741327**

UNIT DESCRIPTOR : This unit covers the outcomes required to carry out inventories and purchasing/sourcing of energy efficient equipment, devices, or services. The unit includes competencies in maintaining inventory records of energy equipment/devices, preparing purchase requisition/orders, and performing delivery acceptance of orders.

ELEMENT	PERFORMANCE CRITERIA (*Italicized* terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Maintain inventory records of energy equipment/ devices	• Relevant ***inventory system*** is used effectively in carrying out inventory function.* • Applicable software or system is used as per task requirement • Inventory records are matched with the actual physical count.*	• Communication techniques • Knowledge on operating instructions • Knowledge on software and hardware system • Inventory management, tracking and record monitoring systems/ techniques • Record of machineries/ equipment supplier information	• Applying relevant technology • Communicating skills • Using software application skills • Maintaining complete records • Tracking expiry dates of products (chemicals) and warranty coverage
2. Prepare purchase requisition/ orders	• Specifications and terms of reference are checked for completeness and appropriateness for end use or purpose.* • Proposals are evaluated based on life cycle cost and equipment efficiency.*	• Specification for items being purchased • Conduct of technical evaluation of vendor proposal • Lifecycle costing • Recording or Log in Techniques • Tracking and Record	• Ability to coordinate with suppliers • Analytical skills • Familiarity with Tracking Systems • Ability to coordinate with suppliers

		Monitoring Systems/ techniques • Record of machineries/ equipment supplier information	
3. Perform delivery acceptance of orders	• Delivered item are tested and evaluated based on specifications and standards and terms of reference of the purchase order.* • All purchases are tracked against warranty and expiry dates. *	• Specifications and terms of reference of the items • Familiarity of purchase order and contract conditions • Identification and labeling of the equipment • Preparation of Records • Identification and labeling of the equipment • Records and log ins of Purchases • Warranty cards and information	• Reading and writing skills • Skill in recognizing and detecting defects of units delivered • Attention to details • Familiarity of the areas where energy consuming devices are located • Familiarity of Users and Suppliers

** Critical Aspects of Competency*

RANGE OF VARIABLES

VARIABLE	RANGE
1. Inventory System	Inventory system may include: 1.1 Records and log ins of Purchases, installations, and warehouse inventory count 1.2 Warranty and guarantee cards and information 1.3 Materials safety and data sheet 1.4 Contact Persons of the supplier

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Maintained inventory records of energy equipment/ devices 1.1.1 Used relevant inventory system effectively in carrying out inventory function 1.2.1 Matched inventory records with the actual physical count 1.2 Prepared purchase requisition/ Orders 1.2.1 Checked specifications and terms of reference for completeness and appropriateness for end use or purpose 1.2.2 Evaluated proposals based on life cycle cost and equipment efficiency 1.3 Performed delivery acceptance of orders 1.3.1 Tested and evaluated delivered item based on specifications and standards and terms of reference of the purchase order 1.3.2 Tracked all purchases against warranty and expiry dates
2 Resource implications	The following resources should be provided: 2.1 Appropriate energy measuring equipment, or any similar framework 2.2 Applicable PPE 2.3 Appropriate resources 2.4 Workplace / assessment location 2.5 Legislation, policies, procedures, protocol, and local ordinances relating to energy utilization.
3 Method of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Observation with oral questioning 3.2 Written test 3.3 Portfolio
4 Context of assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : INSTALL, OPERATE AND MAINTAIN ENERGY-CONSUMIN MACHINES, EQUIPMENT, AND SERVICES IN FACILITIES.

UNIT CODE : UTL741328

UNIT DESCRIPTOR : This unit covers the outcomes required to carry out installation, operation and maintenance of energy-consuming machines and equipment in facilities. This involves working with a team. The scope of this unit covers taking into account all equipment and devices used.

ELEMENT	PERFORMANCE CRITERIA (***Italicized Bold*** terms are elaborated in the range of variables)	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for installation work	• Instructions for the installation and work activities are communicated and confirmed to ensure clear understanding based on manufacturers and engineering requirements • Tools, equipment, and PPE needed in specific work are identified and checked to ensure the work correctly as intended and are safe to use in accordance with established procedures. * • Materials and work methodology needed for installation work are obtained in accordance with established procedures. * • installation teams are identified for actual installation	• Awareness on energy equipment and devices and its functions and specifications • Communication techniques • Health and safety procedures on transport, handling, installation of equipment • Installation manual • Company policy in relation to relevant technology • Machineries/ equipment and their application • Other related documents and information needed for installation	• Planning skills • Coordination and teamwork • Communication skills • Identifying relevant energy technology on job • Skill in using hand tools and power tools to do assembly. • Skill in determining if all electrical connections are within standards and regulations requirements
2. Install energy-consuming machines and equipment in facilities.	• Energy consuming machines and equipment are installed following standard installation guides and ***reference materials***. *	• Communication techniques • Health and safety procedures on transport, handling,	• Applying relevant technology • Communicating skills

	• Relevant process, systems and technology needed in the installation is used effectively in carrying out the installation function. * • Software and hardware are used as applicable • Energy consuming machines and equipment are tested and commissioned following standards. * • Management concepts are observed and practiced per established energy efficiency and conservation (EEC) practices	installation of equipment • Installation manual • Other related documents and information needed for installation • Knowledge on Operating instructions • Understanding software and hardware system	• Using software application skills • Technical skills for installation work (electrical, mechanical, civil, etc.) • Use of Installation Manuals • Interpretation skills of drawings on manuals
2. Notify completion of installation work	• Final checks are made to ensure the installation work conforms to instructions and requirements. * • Supervisor is notified upon completion of work. * • All ***relevant documents*** are turned over to concerned parties • Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked, and returned to storage in accordance with established procedures • Work area is cleaned and made safe	• Use of turnover Checklists • Health and safety procedures on transport, handling, installation of equipment including storage and disposal • Installation manual • Familiarity with required tools • Preparation of a log sheet for all equipment users. • Documentation of all necessary procedures and steps to guide users • Other related documents and information needed for installation, operation, maintenance, and troubleshooting	• Use of Installation Manuals • Coordination skills • Inventory of equipment, tools, and parts on and off job sites. • Maintain a clean, organized environment at the job site

4. Operate and maintain energy-consuming machines and equipment in facilities	• Safety policies and procedures are followed in accordance with OSH and enterprise procedures. * • Materials, tools, equipment, testing devices and PPE needed are prepared for the maintenance work requirements. * • Potential hazards are identified for prevention and control measures are selected in accordance with the work plan and site procedures • Operation and maintenance of energy consuming equipment is performed in accordance with applicable standards and policies on operation and maintenance. * • Work instructions are prepared according to machine's manual and established enterprise procedures • Concerned department/ personnel are informed on the schedule of work according to standard operating procedure • Availability of maintenance records are prepared in accordance with established procedure. *	• Awareness on EEC technology and its function • Operation and maintenance procedures • Repair and maintenance procedure • Health and safety procedure • Upgrading of technology • Organizational set-up/workflow • Incident management and disaster management	• Performing basic troubleshooting and repair skills • Performing preventive maintenance • Identifying failures or defects • Communication skills • Applying corrective maintenance.

** Critical Aspects of Competency*

RANGE OF VARIABLES

VARIABLE	RANGE
1. relevant documents	May include: 1.1 MSDS, 1.2 installation guide, 1.3 operating manual, 1.4 warranty, 1.5 guarantee, 1.6 contact information of suppliers
2. Reference materials	May include: 2.1 Operation Manual 2.2 Equipment Manual 2.3 Installation Procedures 2.4 Preventive Maintenance Manual 2.5 Safety and handling procedures of equipment

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Planned and prepared for installation work 1.1.1 Identified and checked tools, equipment and PPE needed in specific work to ensure the work correctly as intended and are safe to use in accordance with established procedures 1.1.2 Obtained materials and work methodology needed for installation work in accordance with established procedures 1.2 Installed energy-consuming machines and equipment in facilities are tested and operates properly 1.2.1 Installed energy consuming machines and equipment following standard installation guides and reference materials 1.2.2 Used relevant process, systems and technology needed in the installation effectively in carrying out the installation function 1.2.3 Tested and commissioned energy consuming machines and equipment following standards 1.4 Notified completion of installation work 1.3.1 Made final checks to ensure the installation work conforms to instructions and requirements 1.3.2 Notified supervisor upon completion of work 1.4 Operated and maintained energy-consuming machines and equipment in facilities

	1.4.1 Safety policies and procedures are followed in accordance with OSH and enterprise procedures 1.4.2 Prepared materials, tools, equipment, testing devices and PPE needed for the maintenance work requirements 1.4.3 Performed operation and maintenance of energy consuming equipment in accordance with applicable standards and policies on operation and maintenance 1.4.4 Prepared availability of maintenance records in accordance with established procedure
2. Resource Implications	The following resources should be provided: 2.1 Appropriate energy measuring equipment 2.2 Applicable PPE 2.3 Appropriate installation, operation, and maintenance tools 2.4 Workplace or assessment area
3. Method of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Observation with oral questioning 3.2 Written test 3.3 Portfolio
4. Context of assessment	4.1 Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

SECTION 3. TRAINING ARRANGEMENTS

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for Energy Efficiency and Conservation NC III.

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 include green technology, issues on health and drugs and catering to persons with disabilities (PWD's) to accompany their curricula.

Course Title: Energy Efficiency and Conservation **PQF Level:** NC III

Nominal Training Duration:

40 hrs. – Basic Competencies
44 hrs. – Common Competencies
40 hrs. – Core Competencies
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124 hrs. – Total
\+ 480 hrs. – Supervised Industry Learning (SIL)
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604 hrs. – Total training duration

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* SIL can be delivered thru Dual Training System (DTS)/Dualized Training Program (DTP) or Enterprise-based Training

Note: Trainees who are employed workers may request the SIL to be done in their own company upon approval of the training provider

Course Description:

This course is designed to provide the learner with knowledge, practical skills and attitude, applicable in performing work activities involve in managing energy consumption of facilities, equipment and devices, planning and supporting the implementation of regular energy audit, performing energy consumption monitoring and control, carrying out implementation and improvement of energy efficiency measures, coordinating inventories and purchasing/sourcing of energy efficient equipment or devices, and installing, operating and maintaining energy-consuming machines and equipment in facilities.

Upon completion of the course, the learners are expected to demonstrate the above-mentioned competencies to be employed. To obtain this, all units prescribed for this qualification must be achieved.

BASIC COMPETENCIES
(40 hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
1. Lead workplace communication	● Communicate information about workplace processes	● Read ○ Effective verbal communication methods ○ Sources of information ● Practice organizing information ● Identify organization requirements for written and electronic communication methods ● Follow organization requirements for the use of written and electronic communication methods ● Perform exercises on understanding and conveying intended meaning scenario	● Lecture ● Demonstration ● Practical exercises ● Role Play	● Written Test ● Observation	2 Hours
	● Lead workplace discussions	● Describe: ○ Organizational policy on production, quality, and safety ○ Goals/ objectives and action plan setting ● Read ○ Effective verbal communication methods ● Prepare/set action plans based on organizational goals and objectives	● Group discussion ● Lecture ● Demonstration	● Oral evaluation ● Written Test ● Observation	2 Hours
	● Identify and communicate issues arising in the workplace	● Describe: ○ Organizational policy in dealing with issues and problems ● Read ○ Effective verbal communication methods	● Group discussion ● Lecture	● Oral evaluation ● Written Test	2 Hours

2. Lead small teams	• Provide team leadership	• Discussion of Company policies and procedures • Read web pages on situational leadership • Role play on situational leadership	• Group work • Role Play • Lecture/ Discussion • Individual Work	• Role Play • Written Test	1 Hour
	• Assign responsibilities	• Read web pages on performance management • Case study on allocating roles and responsibilities based on competencies of current staff	• Individual Work • Case Study	• Role Play • Written Test	1 Hour
	• Set performance expectations for team members	• Role play to communicate performance expectations with staff • Discussion on performance issues	• Lecture/ Discussion • Role Play	• Role Play • Written Test	1 Hour
	• Supervise team performance	• Discussion on performance monitoring • Role play on providing feedback on performance • Role play on performance coaching • Discussion on keeping the team informed of team performance • Case study on Team performance monitoring and feedback	• Lecture/ Discussion • Role Play • Case Study	• Role Play • Written Test	1 Hour
3. Apply critical thinking and problem-solving techniques in the workplace	• Examine specific workplace strategies	• Show thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations • Show mastery of the current industry hardware and software products and services • Discuss process of identification of fundamental causes of specific workplace challenges	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour

		● Show mastery of knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations ○ Relevant equipment and operational processes ○ Enterprise goals, targets, and measures ○ Enterprise quality OHS and environmental requirement ○ Enterprise information systems and data collation ○ Industry codes and standards			
	● Analyze the causes of specific workplace challenges	● Show thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations ● Show mastery of the current industry hardware and software products and services ● Discuss process of identification of fundamental causes of specific workplace challenges ● Show mastery of knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations ○ Relevant equipment and operational processes ○ Enterprise goals, targets, and measures	● Group discussion ● Lecture ● Demonstration ● Role playing	● Case Formulation ● Life Narrative Inquiry (Interview) ● Standardized test	1 Hour

		○ Enterprise quality OHS and environmental requirement ○ Enterprise information systems and data collation ○ Industry codes and standards ● Identify extent and causes of specific challenges in the workplace ● Use of range of analytical problem-solving techniques ● Formulate clear-cut findings on the nature of each identified workplace challenges			
	● Formulate resolutions to specific workplace challenges	● Show thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations ● Show mastery of the current industry hardware and software products and services ● Discuss process of identification of fundamental causes of specific workplace challenges ● Show mastery of knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations ○ Relevant equipment and operational processes ○ Enterprise goals, targets, and measures ○ Enterprise quality OHS and environmental requirement	● Group discussion ● Lecture ● Demonstration ● Role playing	● Case Formulation ● Life Narrative Inquiry (Interview) ● Standardized test	1 Hour

		○ Enterprise information systems and data collation ○ Industry codes and standards ● Identify extent and causes of specific challenges in the workplace ● Use of range of analytical problem-solving techniques ● Formulate clear-cut findings on the nature of each identified workplace challenges ● Discus strategies on devising, communicating, implementing, and evaluating strategies and techniques in addressing specific workplace challenges			
	● Implement action plans and communicate results	● Identify extent and causes of specific challenges in the workplace ● Use of range of analytical problem-solving techniques ● Formulate clear-cut findings on the nature of each identified workplace challenges ● Discus strategies on devising, communicating, implementing, and evaluating strategies and techniques in addressing specific workplace challenges	● Group discussion ● Lecture ● Demonstration ● Role playing	● Case Formulation ● Life Narrative Inquiry (Interview) ● Standardized test	1 Hour
4. Work in a Diverse Environment	● Develop an individual's cultural awareness and sensitivity	● Show understanding of cultural diversity in the workplace ● Recognize norms of behavior for interacting and dialogue with specific groups (e. g., Muslims and other non-Christians, non-Catholics, tribes/ethnic groups, foreigners)	● Small Group Discussion ● Interactive Lecture ● Brainstorming ● Demonstration ● Role-playing	● Demonstration or simulation with oral questioning ● Group discussions and interactive activities	1 Hour

		● Demonstrate different methods of verbal and non-verbal communication in a multicultural setting ● Apply cross-cultural communication skills (i.e., different business customs, beliefs, communication strategies) ● Show affective skills – establishing rapport and empathy, understanding, etc. ● Demonstrate openness and flexibility in communication ● Recognize diverse groups in the workplace and community as defined by divergent culture, religion, traditions, and practices		● Case studies/ problems involving workplace diversity issues ● Written examination ● Role Playing	
	● Work effectively in an environment that acknowledges and values cultural diversity	● Explain the value of diversity in the economy and society in terms of Workforce development ● Discuss the importance of inclusiveness in a diverse environment ● Discuss the importance of shared vision and understanding of and commitment to team, departmental, and organizational goals, and objectives ● Identify and exhibit strategies for customer service excellence ● Demonstrate cross-cultural communication skills and active listening ● Recognize diverse groups in the workplace and community as defined by divergent culture, religion, traditions, and practices ● Demonstrate collaboration skills	● Small Group Discussion ● Interactive Lecture ● Brainstorming ● Demonstration ● Role-playing	● Demonstration or simulation with oral questioning ● Group discussions and interactive activities ● Case studies/ problems involving workplace diversity issues ● Written examination ● Role Playing	1 Hour

	● Identify common issues in a multicultural and diverse environment	● Explain the value, and leverage of cultural diversity ● Discuss the inclusivity and conflict resolution ● Describe the workplace harassment ● Explain the change management and cite ways to overcome resistance to change ● Demonstrate advanced strategies for customer service excellence ● Address diversity-related conflicts in the workplace ● Eliminate discriminatory behavior towards customers and co-workers ● Utilize change management policies in the workplace	● Small Group Discussion ● Interactive Lecture ● Brainstorming ● Demonstration ● Role-playing	● Demonstration or simulation with oral questioning ● Group discussions and interactive activities ● Case studies/ problems involving workplace diversity issues ● Written examination ● Role Playing	1 Hour
5. Propose methods of applying learning and innovation in the organization	● Assess work procedures, processes, and systems in terms of innovative practices	● Show mastery of the following practical concepts (e.g., 7 habits of highly effective people, character strengths that foster learning and innovation, five minds of the future, adaptation concepts and transtheoretical model of behavior change) ● Demonstrate collaboration and networking skills ● Show basic skills in research ● Generate practical insights on how to improve organizational procedures, processes, and systems	● Interactive Lecture ● Appreciative Inquiry ● Demonstration ● Group work	● Psychological and behavioral Interviews ● Performance Evaluation ● Life Narrative Inquiry ● Review of portfolios of evidence and third-party workplace reports of on-the-job performance. ● Standardized assessment of character	1 Hour

				strengths and virtues applied	
	• Generate practical action plans for improving work procedures, processes	● Show mastery of the following practical concepts (e.g., 7 habits of highly effective people, character strengths that foster learning and innovation, five minds of the future, adaptation concepts and transtheoretical model of behavior change) ● Demonstrate collaboration and networking skills ● Show basic skills in research ● Generate practical insights on how to improve organizational procedures, processes, and systems ● Set up action plans on how to apply innovative procedures in the organization ● Set up action plans on how to apply innovative procedures in the organization ● Generate practical insights on how to improve organizational procedures, processes, and systems	● Interactive Lecture ● Appreciative Inquiry ● Demonstration ● Group work	● Psychological and behavioral Interviews ● Performance Evaluation ● Life Narrative Inquiry ● Review of portfolios of evidence and third-party workplace reports of on-the-job performance. ● Standardized assessment of character strengths and virtues applied	1 Hour
	• Evaluate the effectiveness of the proposed action plans	● Show mastery of the following practical concepts (e.g., 7 habits of highly effective people, character strengths that foster learning and innovation, five minds of the future, adaptation concepts and transtheoretical model of behavior change) ● Demonstrate collaboration and networking skills ● Show basic skills in research	● Interactive Lecture ● Appreciative Inquiry ● Demonstration ● Group work	● Psychological and behavioral Interviews ● Performance Evaluation ● Life Narrative Inquiry ● Review of portfolios of evidence and third-party	1 Hour

		● Generate practical insights on continuous improvement		workplace reports of on-the-job performance. ● Standardized assessment of character strengths and virtues applied	
6. Use information systematically	● Use technical information	● Lecture and discussion on: ○ Application in collating information ○ Procedures for inputting, maintaining, and archiving information ○ Guidance to people who need to find and use information ● Organizing information into a suitable form for reference and use ● Classify stored information for identification and retrieval ● Operate the technical information system by using agreed procedures	● Lecture ● Group Discussion ● Hands on ● Demonstration	● Oral evaluation ● Written Test ● Observation ● Presentation	4 Hours
	● Apply information technology (IT)	● Lecture and discussion on: ○ Attributes and limitations of available software tool ○ Procedures and work instructions for the use of IT ○ Operational requirements for IT systems ○ Sources and flow paths of data ○ Security systems and measures that can be used ○ Methods of entering and processing information	● Lecture ● Group Discussion ● Self-paced handout/ module ● Hands on ● Demonstration	● Oral evaluation ● Written Test ● Observation ● Presentation	2 Hours

		● Use procedures and work instructions for the use of IT ● Extract data and format reports ● Use WWW applications			
	● Edit, format and check information	● Lecture and discussion on: ○ Basic file-handling techniques ○ Techniques in checking documents ○ Techniques in editing and formatting ○ Proof reading techniques ● Use different techniques in checking documents ● Edit and format information applying different techniques ● Proofread information applying different techniques	● Lecture ● Group Discussion ● Self-paced handout/ module ● Hands on ● Demonstration	● Oral evaluation ● Written Test ● Observation ● Presentation	2 Hours
7. Evaluate Occupational Safety and Health Work Practices	● Interpret Occupational Safety and Health practices	● Discuss the OSH standards, principles, and legislations ● Identify OSH work practices issues ● Discuss standard safety requirements	● Lecture ● Group Discussion	● Written Exam ● Demonstration ● Observation ● Interviews/ Questioning	1.5 Hours
	● Set OSH work targets	● Discussion in actions plans that are necessary in achieving the OSH target	● Lecture ● Group Discussion	● Written Exam ● Demonstration ● Observation ● Interviews/ Questioning	1 Hour
	● Evaluate effectiveness of Occupational Safety and	● Practice evaluating safety data (Historical or Simulated)	● Lecture ● Group Discussion	● Written Exam ● Demonstration ● Observation ● Interviews/ Questioning	1.5 Hours

	Health work instructions				
8. Evaluate Environmental Work Practices	● Interpret Environmental practices, policies, and procedures	● Discussion Environmental Issues regarding ○ Water Quality ○ National and Local Government Issues ○ Safety ○ Endangered Species ○ Noise ○ Air Quality ○ Historic ○ Waste ○ Cultural ● Updating of existing occupation practices	● Lecture ● Group Discussion ● Demonstration	● Written Exam ● Demonstration ● Observation ● Interviews/ Questioning	1 Hour
	● Establish targets to evaluate environmental practices	● Discussion on ○ lower production costs and energy consumption ○ Environmentally Sound Processes ○ Resource Efficient ○ Recycling and Waste Management ● Simple case study regarding energy efficiency	● Lecture ● Group Discussion ● Demonstration	● Written Exam ● Demonstration ● Observation ● Interviews/ Questioning	1 Hour
	● Evaluate effectiveness of environmental practices	● Identifying effective environmental practices relevant to the industry/occupation ○ Implementation of energy efficiency	● Lecture ● Group Discussion ● Demonstration ● Case Study	● Written Exam ● Demonstration ● Observation ● Interviews/ Questioning ● Third Party Reports	1 Hour
9. Facilitate Entrepreneurial Skills for Micro-Small-Medium	● Develop and maintain micro-small-medium	● Discussions on business models and strategies	● Lecture/ Discussion ● Case Study ● Demonstration	● Written Test ● Portfolio ● Work Related Project	2 Hours

Enterprises (MSMEs)	enterprise (MSMEs) skills in the organization	● Discussion on Types and categories of businesses and business internal control ● Discussion on Relevant National and local legislations affecting businesses ● Prepare promotional materials ● Practice basic bookkeeping			
	● Establish and Maintain client-base/market	● Role play on customer and employee relations ● Discussion on Basic product promotion strategies ● Preparation of Basic Feasibility study ● Case studies on Basic Business ethics ● Prepare basic advertising materials	● Role Play ● Lecture Discussion ● Case study	● Case problem ● Written Test	2 Hours
	● Apply budgeting and financial management skills	● Discussion on: ○ Basic cost-benefit analysis ○ Basic financial management ○ Basic financial accounting ○ Business internal controls	● Role Play ● Lecture Discussion ● Group work	● Written Test ● Case problem	1 Hour

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

COMMON COMPETENCIES
(44 hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Apply Energy Management System Standards	• Access information concerning energy management systems, energy efficiency programs and policies	• Lecture/Discussion on: ○ Energy management system standards ○ Relevant provisions of energy management related regulations and issuances from DOE environmental legislation and codes of practice ○ Energy efficiency standards required in the workplace	• Lecture • Discussion • Field trip • Symposium • Video clips • Simulation/ Role playing	• Written test • Demonstration & questioning • Observation & questioning	1 hours
	• Implement and monitor procedures concerning energy usage	• Lecture/Discussion on: ○ Existing and potential areas for energy savings in the workplace ○ Energy consuming devices/ equipment ○ Relevant energy consumption baseline or standards ○ Workplace procedures	• Lecture • Discussion • Field trip • Symposium • Simulation • On the job training	• Demonstration & questioning • Observation & questioning	1 hours
	• Implement and monitor energy management procedures following the PDCA cycle	• Lecture/Discussion on: ○ Existing energy efficiency and conservation measures ○ Organizational structure and site layout ○ PDCA cycle • Monitor operation performance	• Lecture • Discussion • Field trip • Symposium • Simulation • On the job training	• Demonstration & questioning • Observation & questioning	2 hours
2. Comply with environmental protection procedures	• Access information concerning environmental	• Lecture on relevant environmental protection regulations & codes of practice	• Lecture • Discussion • Demonstration	• Observation in workplace • Demonstration	2 hours

	protection regulations and procedures	• Lecture/Discussion on environmental risks associated with workplace operations and related precautions to control the risk • Lecture/Discussion on environmental protection standards required in the workplace • Lecture on workplace reporting and recording processes and procedures • Accessing information and data • Identifying potential environmental risks and ways of minimizing them	• Viewing multimedia • Hands on practice	• Oral questioning • Third Party Report	
	• Implement and monitor procedures concerning environmental hazards	• Applying environmental protection regulations & codes of practice concerning environmental hazards • Lecture/Discussion on workplace procedures and guidelines for implementing and monitoring procedures concerning environmental hazards • Lecture/Discussion on workplace environmental hazards and related hazard control measures • Using equipment and resources required when implementing and monitoring environmental protection procedures • Lecture/Discussion on Organizational structure and site layout • Reporting and recording processes and procedures • Application of problem-solving techniques	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on practice	• Observation in workplace • Demonstration • Oral questioning • Third Party Report	2 hours

		• Identifying potential environmental hazards and ways on minimizing them • identifying and correctly using equipment and vehicles in accordance with environmental protection regulations and guidelines			
	• Implement and monitor environmental control procedures	• Applying relevant environmental protection regulations & codes of practice for environmental control procedures • Lecture/Discussion on workplace procedures and guidelines for implementing and monitoring environmental control procedures • Using equipment and resources required when implementing and monitoring environmental control procedures • Carry out workplace reporting and recording processes and procedures • Application of problem-solving techniques • counsel, advise and inform others on environmental control procedures • identifying and correctly using equipment and vehicles in accordance with environmental control procedures, regulations, and guidelines	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on practice	• Observation in workplace • Demonstration • Oral questioning	3.hours

3.Observe procedures, Specification and Manuals of Instructions	• Identify and access specification/ manuals	• Familiarization on types of manuals used in transmission lines • Identification of symbols used in the manuals • Discussion on manuals and specifications • Accessing information and data	• Lecture-demonstration	• Oral questioning • Written test or examination	2 Hours
	• Interpret manuals	• Interpretation of symbols used in manuals • Lecture and discussion on system of measurements • Lecture on Unit conversion • Accessing information and data	• Actual demonstration • Group discussion	• Direct observation • Written test or examination	2 Hours
	• Apply information in manual	• Application of symbols in manuals • Applying conversion of units of measurements • Applying information from manuals	• Demonstration • Group discussion	• Demonstration Practical and oral exam	2 Hours
	• Store Manual	• Manual storing and maintaining procedures • Storing and maintaining manuals	• Demonstration • Group discussion	• Demonstration • Practical and oral exam	2 Hours
4. Maintain and operate tools and equipment	• Plan and prepare for work to operate and maintain tools and equipment	• Acquire sample work instruction • Interpret sample work instruction • Identify necessary and appropriate occupational health and safety requirements based on job specification • Identify relevant tools, equipment and hardware based on job specifications	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on practice	• Observation in workplace • Demonstration • Oral questioning	1 hour
	• Prepare hardware, tools and equipment for operation and maintenance	• Enumerate the personal protective equipment in preparing tools, hardware, and equipment as per job requirements • Procedures in acquiring tools, equipment, and hardware • Perform functionality test of tools as per manufacturers standards	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on practice	• Observation in workplace • Demonstration • Oral questioning	1 hour

	• Operate tools and equipment	• Enumerate the personal protective equipment in operating tools, hardware, and equipment as per job requirements • Discuss procedures in proper handling and application of tools and equipment based on job assignments • Discuss special features and function of identified tools and equipment	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on practice	• Observation in workplace • Demonstration • Oral questioning	2 hours
	• Check condition of tools and equipment	• Discuss and classify tools and equipment based on different usage and requirements • Study proper segregation of functional and non-functional tools and equipment • Analyze different safety procedures in handling tools and equipment as per manufacturer's instructions • Examine condition of Personal protective equipment and tools	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on practice	• Observation in workplace • Demonstration • Oral questioning	2 hours
	• Perform basic preventive maintenance	• Identify appropriate and different types of lubricants for different type and condition of equipment. • Review lubrication procedures in every preventive maintenance • Explain and perform testing and cleaning of tools and equipment • Practice inspection of working and non-working tools and equipment • Perform repair and replacement of components and parts for damage and non-working equipment • Discuss good housekeeping after preventive maintenance procedure	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on practice	• Observation in workplace • Demonstration • Oral questioning	4 hours

	• Store tools and equipment	• Discuss proper inventory and auditing of tools and equipment as per company procedure • Describe and determine different storage places for different tools and equipment • Identify conditions, weather, and surroundings appropriate and not appropriate for storage of tools and equipment • Create checklist for inventory and auditing of tools and equipment	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on practice	• Observation in workplace • Demonstration • Oral questioning	2 hours
5. Perform Computer Operations	• Plan and prepare for task to be undertaken	• Plan and prepare computer operation activity • Determine task requirements based on required output • Determine appropriate hardware and software • Identify/Select types of computers and basic features of different operating systems • Interpret and follow client-specific guidelines & procedures • Plan task as per data security guidelines	• Lecture • Modular • Computer based training (e-learning) • Project method • On the job training	• Written/Oral examination • Practical demonstration	2 hours
	• Input data into computer	• Apply basic ergonomics of keyboard and computer user • Enter/Encode data using appropriate computer programs/applications • Check accuracy of encoded data/information per SOP • Save and store inputted data in storage media • Storage devices and basic categories of memory	• Lecture • Modular • Group discussion • Project method • On the job training	• Written/Oral examination • Practical demonstration	2 hours

		• Identify and define relevant types of software			

	• Access information using computer	• Select correct program/ application based on job requirements
		• Access computer data/files
		• Interpret general security, privacy legislation & copyright
		• Use Productivity Application
		  ○ Microsoft office applications
		• Learn Business Application
		  ○ Introduction to Basic Programming software
		• Apply basic ergonomics of keyboard and computer user
			• Lecture
			• Computer based training (e-learning)
			• On the job training
				• Written/Oral examination
				• Practical demonstration
					2 hours

	• Produce/ output data using computer system	• Identify types and function of computer peripheral devices
		• Print and scan office documents and materials
		• Send office/ business documents through facsimile
		• Transfer files or data between compatible systems using computer software, hardware/ peripheral devices
		• Save documents in storage devices
		  ○ CD/DVD
		  ○ USB drives
		  ○ Hard disk drives
			• Lecture
			• Group discussion
			• Modular
			• On the job training
				• Written/Oral examination
				• Practical demonstration
					2 hours

	• Maintain computer equipment and systems	• Perform computer equipment/ system basic maintenance procedures
		  ○ Perform basic file maintenance procedures
		  ○ Perform cleaning of PC parts/ hardware components
			● Demonstration
			● Simulation
			● Modular
			● Video clips
			● Computer based training (e-learning)
				● Written/Oral examination
				● Practical demonstration
					4 hours

		○ Scan/Debug computer software and applications ○ Perform cleaning and defragmentation of computer files ○ Perform backup of computer files • Enumerate and define different types of computer viruses			

CORE COMPETENCIES
(40 hours) + 480 hours SIL

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Manage energy consumption of facilities, equipment, and devices	• Check for current consumption of facilities, equipment, and devices	• Lecture and discussion on energy consumption measurement • Identification of equipment and devices for measurement of energy consumption • Discussion on work instruction on measurement of energy consumption • Discussion on high energy consumption detection	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
	• Check appropriate ways to prevent energy consumption increase	• Lecture on: ○ Specifications of equipment and devices performance ○ Up-to-date knowledge of energy efficient technologies ○ Technical reference standards ○ Different energy efficiency reference standards in energy consumption ○ Procedures in modification, retrofitting and upgrading energy equipment and devices ○ Production and operation processes and control settings • Discussion and demonstration using instrumentation for measuring energy consumption	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours

	• Perform modifications and improvement of settings, processes, and behaviors	• Lecture and discussion on: ○ Safety protocols/ OSHA ○ Proper usage of basic electrical and mechanical tools ○ Correct and safe modification of energy efficient devices/ equipment • Make analysis and recommendations on identified high energy consumption use	• Lecture • Discussion • Actual Demonstration • Viewing multimedia	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
	• Conduct management review on energy performance	• Lecture and discussion on: ○ Energy Management System (EnMS) ○ Energy performance plans versus targets ○ Company's energy policy, process, and procedures ○ Recommended action plans to improve performance • Familiarizing the operating performance of installed equipment	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
		Supervised Industry Learning	**Industry immersion**	**Learner's progress report**	**80 hours**
2. Plan and support the implementation of regular energy audit	• Plan and schedule energy audit	• Lecture and discussion on: ○ Capability building methods ○ Energy audit methodology, principles, process, guidelines, and procedures ○ Facilities production and operation processes and boundaries ○ Scope of an Energy Audit ○ Selection of Audit method based on recognized need • Make sample audit plan and schedule	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours

	• Implement energy audit	• Lecture and discussion on: ○ Data collection and measurement ○ Simple statistical tools and energy auditing techniques ○ Analysis of result ○ Estimates of manpower and budget required ○ Audit monitoring • Presentation of sample analysis of audit result	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
	• Develop and recommend strategies for improving energy efficiency	• Lecture and discussion on: ○ Strategies for improving energy efficiency and energy use reduction ○ Opportunities for improvement of energy efficiency	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
		Supervised Industry Learning	**Industry Immersion**	**Learner's progress report**	**80 hours**
3. Perform energy consumption monitoring and control	• Conduct data gathering	• Lecture and discussion on: ○ Checklists and forms for data gathering ○ Data for energy consumption ○ Understanding of set points parameter	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours

	• Use measuring tools and Instrument Panel for monitoring	• Lecture and discussion on: ○ Use of test and measuring equipment and devices ○ Analog and digital instrumentation panels ○ Facilities electrical and mechanical plans • Demonstration on using measuring tools and Instrument Panel for energy consumption monitoring	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
	• Analyze the energy consumption data	• Lecture and discussion on: ○ Basics of electrical controls ○ Process, operation, and control settings ○ Basic Statistics ○ Analysis of collected energy consumption data ○ Calibration, adjustment, and settings • Presentation of sample analysis of collected data	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
		Supervised Industry Learning	**Industry immersion**	**Learner's progress report**	**80 hours**

4. Carry out implementation and improvement of energy efficiency measures	• Study/select appropriate technology, systems, and processes	• Lecture and discussion on: ○ Use of different processes, systems, and technology ○ Facilities energy performance requirement ○ Machineries/equipment and their application ○ Health and safety procedures ○ Communication techniques ○ Company policy in relation to relevant technology • Identify relevant energy technology on job • Setting up appropriate energy performance baselines and energy performance indicators • Prepare periodic energy consumption and energy conservation program	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
	• Apply relevant technology, systems, and processes	• Lecture and discussion on: ○ Applicable software and hardware system ○ Different energy management concepts ○ Company policy in relation to relevant EEC technology ○ Technology adaptability ○ Best practices on energy efficiency and conservation (EEC) which may pertain to ISO 50001 • Sample presentation on using applicable software and hardware per task requirements	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours

	• Operate and maintain energy production and operation process, system and technology and including applicable EnMS management systems	• Lecture and discussion on: ○ Energy production and operation process, system and technology and including applicable EnMS management systems ○ Management concepts ○ Failures/defects/variations and non-compliance ○ Repair and maintenance procedure ○ Industry standard operating procedures ○ Manufacturer's operating guidelines ○ Occupational health and safety procedures to ensure reliability and safety ○ Upgrading of technology ○ Organizational set-up/workflow	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
		Supervised Industry Learning	**Industry immersion**	**Learner's progress report**	**80 hours**
5. Coordinate inventories and purchasing/ sourcing of energy efficient equipment or devices	• Maintain inventory records of Energy Equipment/ Devices	• Lecture and discussion on: ○ Relevant inventory system ○ Inventory management, tracking and record monitoring systems/ techniques ○ Record of machineries/ equipment supplier information • Presentation/Demonstration of sample inventory records matched with actual physical count	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours

	• Prepare purchase requisition/ Orders	• Lecture and discussion on: ○ Specification for items to be purchase ○ Technical evaluation of vendor proposal ○ Lifecycle costing ○ Recording or Log in Techniques ○ Tracking and Record Monitoring Systems/ techniques ○ Record of machineries/ equipment supplier information	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
	• Perform delivery acceptance of orders	• Lecture and discussion on: ○ Specifications and terms of reference of the items ○ Purchase order and contract conditions ○ Identification and labeling of the equipment ○ Warranty and expiry dates • Familiarize purchase order and contract conditions • Demonstration on identification and labeling of the equipment	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
		Supervised Industry Learning	**Industry immersion**	**Learner's progress report**	**80 hours**

6. Install, operate, and maintain energy-consuming machines and equipment in facilities	• Plan and prepare for installation work	• Lecture and discussion on: ○ Health and safety procedures on transport, handling, installation of equipment ○ Tools, equipment, and PPE needed in installation work ○ Materials and work methodology needed for installation work ○ Installation manual ○ related documents and information needed for installation	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
	• Install energy-consuming machines and equipment in facilities	• Lecture and discussion on: ○ standard installation guides and reference materials ○ Relevant process, systems and technology needed in the installation • Presentation/Demonstration on installation of energy consuming machines and equipment • Presentation/Demonstration on testing and commissioning of energy consuming machines and equipment following standards	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
	• Notify completion of installation work	• Lecture and discussion on: ○ Use of turnover Checklists ○ Preparation of a log sheet for all equipment users ○ Documentation of all necessary procedures and steps to guide users ○ Other related documents and information needed for installation, operation, maintenance, and troubleshooting	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours

	• Operate and maintain energy-consuming machines and equipment in facilities	• Lecture and discussion on: ○ Safety policies and procedures in accordance with OSH and enterprise procedures ○ Awareness on EEC technology and its function ○ Operation and maintenance procedures ○ Repair and maintenance procedure ○ Potential hazards ○ Potential hazards prevention and control measures ○ Incident management and disaster management ○ Maintenance records preparation • Presentation/Demonstration of operation and maintenance of energy consuming equipment	• Lecture • Discussion • Demonstration • Viewing multimedia • Hands on Practice	• Practical demonstration • Oral questioning • Written exam • Presentation report	2 hours
		Supervised Industry Learning	**Industry immersion**	**Learner's progress report**	**80 hours**

3.2 TRAINING DELIVERY

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

a.1 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).

a.2 Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies.

a.3 Training can be done on an actual workplace setting, simulation of a workplace and/or through adoption of modern technology.

a.4 Assessment is based in the collection of evidence of the performance of work to the industry required standards.

a.5 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.

a.6 Training program allows for recognition of prior learning (RPL) or current competencies.

a.7 Training completion is based on satisfactory completion of all specified competencies not on the specified nominal duration of learning.

b. 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:

b.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 technologies 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.

- Supervised Industry Learning (SIL) or on-the-job training (OJT) is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies as prescribed in the training regulations. It is imperative that the deployment of trainees in the workplace is adhered to training programs agreed by the institution and enterprise and status and progress

of trainees are closely monitored by the training institutions to prevent opportunity for work exploitation.

- The classroom-based or in-center instruction uses of learner-centered methods as well as laboratory or field-work components.

b.2 **Enterprise-Based:**

- Formal Apprenticeship is training within employment involving a contract between an apprentice and an enterprise on an approved apprentice able 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.

b.3 **Community-Based:**

- Community-Based Training is 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:

a. He must have completed at least 2 years of college education or completed a TESDA technical vocational program related to energy, power, and associated technologies (NC II minimum entry level or currently NC III level).
b. Has the necessary knowledge, skills, and experience (2 years work related to energy, power, and associated technologies)
c. Able to communicate both oral and/or written
d. Must have at least (2) years of continuous hands-on experience in the installation, operation and maintenance of energy-consuming machines and equipment in facilities.

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.

LIST OF TOOLS, EQUIPMENT AND MATERIALS

Recommended list of tools, equipment, and materials for the training of **25 trainees** for Energy Efficiency and Conservation NC III:

Up-to-date tools, materials, and equipment of equivalent functions can be used as alternatives. This also applies in consideration of community practices and their availability in the local market.

TOOLS		EQUIPMENT		MATERIALS	
QTY	**ITEM**	**QTY**	**ITEM**	**QTY**	**ITEM**
5 sets	Screwdrivers, all types	1 unit	Flue Gas Analyzers	5 reams	Bond Paper
5 sets	Pliers, varied sizes	1 unit	Lux Meters	2 pcs	Eraser, White board
5 sets	Adjustable wrenches, varied sizes	1 unit	pH meter	1 set	Board markers, assorted colors
		1 unit	Thermal Insulation Scanner/ Thermal Imaging Camera	1 set per pax	Training Manuals/ Documents / Reference materials
		1 unit	Temperature and Humidity Tester		
		1 unit	Infrared Thermometers		
		1 unit	Handheld/Thermo-hygrometer		
		1 unit	Power quality analyzer		
		1 unit	Ultrasonic Leak Detector (optional)		
		1 unit	Conductivity/Insulation Multimeter		
		1 unit	Distance Laser Meter		
		1 unit	Handheld Ultrasonic Flow meter		
			IT SYSTEM		
		1 unit	PC/Laptop		
		1 unit	Sound system		
		1 unit	LCD /multimedia projector / TV monitor		
		1 unit	White board		
			PPE		
		5 pcs	Safety Helmet		
		5 sets	Gloves, rubber/leather/cloth		
		5 pairs	Safety Goggles		
		5 pairs	Safety shoes		
		5 sets	Safety harness (optional)		

NOTES: **Access to and use of equipment /facilities can be provided through cooperative arrangements or MOA with other partner-companies.**
Subject to conformity of the health and safety protocols

3.4 TRAINING FACILITIES

Based on a class intake of 25 students/trainees.

SPACE REQUIREMENTS	Space (m)	Area in Sq. Meters	Qty	Total Area in Sq. Meters
A. LECTURE AREA / WORKSHOP AREA*	6 x 10	60	1	60
B. LEARNING RESOURCE AREA	3 x 4	12	1	12
C. TOOL/STORAGE /CABINET AREA*	2 x 2	4	1	4
D. WASHROOM & TOILET *	2 x 3	6	1	6
TOTAL				82
F. FACILITIES/EQUIPMENT/ CIRCULATION				25
TOTAL AREA				**107**

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

NOTES: Access to and use of equipment /facilities can be provided through cooperatives arrangements or MOA with other partner-companies.
Subject to conformity of the health and safety protocols

3.5 TRAINERS QUALIFICATIONS ENERGY EFFICIENCY AND CONSERVATION NC III

a. Must be a holder of National TVET Trainer Certificate (NTTC) level I in Energy Efficiency and Conservation NC III or Can also be an Energy Manager or Energy Auditor duly certified by the DOE.

b. Must have a PRC license related to energy, power, and associated technologies.

c. Must have at least 2 years relevant industry experience within the last 5 years.

d. Must be computer literate.

3.6 INSTITUTIONAL ASSESSMENT

Institutional Assessment is gathering of evidence to determine the achievements of the requirements of the qualification to enable the trainer make judgement whether the trainee is competent or not competent.

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

a. To attain the National Qualification of **Energy Efficiency and Conservation NC III**, the candidate must demonstrate competency in all the units listed in Section 1. Successful candidates shall be awarded a **National Certificate II** signed by the TESDA Director General.

b. The qualification **Energy Efficiency and Conservation NC III** can be attained through demonstration of competence through project-type assessment covering all the units required.

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

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

   d.1 Graduate of formal or non-formal training in energy, power and associated technologies or related training.

   d.2 Worker with at least 2 years relevant experience in operation and maintenance of energy consuming machines and equipment.

e. **Recognition of Prior Learning (RPL).** Candidates who have gained competencies through previous work or life experiences, education, and informal training related to all the core competencies may apply for recognition in the qualification through Portfolio Assessment in accordance with the provision of **TESDA Circular No. 59, Series of 2020.**

f. 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

a. 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.1 Identify the candidate's skills and knowledge.

   a.2 Highlight gaps in candidate's skills and knowledge.

   a.3 Provide critical guidance to the assessor and candidate on the evidence that need to be presented.

   a.4 Assist the candidate to identify key areas in which practice is needed or additional information or skills that should be gained prior.

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

c. *Accredited Competency Assessor*. Only competency assessor accredited by TESDA is authorized to assess the competencies of candidates for national certification. Or he can also be an Energy Manager or Energy Auditor duly certified by the DOE.

COMPETENCY MAP – UTILITIES (ENERGY) SECTOR
ENERGY EFFICIENCY AND CONSERVATION NC III

BASIC COMPETENCIES

Receive and respond to workplace communication	Participate in workplace communication	**Lead workplace communication**	Utilize specialized communication skill	Manage and sustain effective communication strategies
Work with others	Work in team environment	**Lead small teams**	Develop and lead teams	Manage and sustain high performing teams
Solve/address routine problems	Solve/address general workplace problems	**Apply critical thinking and problem-solving techniques in the workplace**	Perform higher order thinking processes and apply techniques in the workplace	Evaluate higher order thinking skills and adjust problem solving techniques
Enhance self-management skills	Develop career and life decisions	**Work in a diverse environment**	Contribute to the practice of social justice in the workplace	Advocate strategic thinking for global citizenship
Support Innovation	Contribute to workplace innovation	**Propose methods of applying learning and innovation in the organization**	Manage innovative work instructions	Incorporate innovation into work procedures
Access and maintain information	Present relevant information	**Use information systematically**	Manage and evaluate usage of information	Develop systems in managing, and maintaining information
Follow occupational safety and health policies and procedures	Practice occupational safety and health policies and procedures	**Evaluate occupational safety and health work practices**	Lead in improvement of Occupational Safety and Health Program, Policies and Procedures	Manage implementation of occupational safety and health programs in the workplace
Apply environmental work standards	Exercise efficient and effective sustainable practices in the workplace	**Evaluate environmental work practices**	Lead towards improvement of environmental work programs, policies, and procedures	Manage implementation of environmental programs in the workplace

Adopt entrepreneurial mindset in the workplace	Practice entrepreneurial skills in the workplace	**Facilitate entrepreneurial skills for micro-small-medium enterprises (MSMEs)**	Sustain entrepreneurial skills	Develop and sustain a high-performing enterprise

COMMON COMPETENCIES

Apply energy management system standards (ISO 50001)	**Comply with environmental protection procedures**	**Observe procedures, specifications, and manual of instruction**	**Operate and maintain tools and equipment**	**Perform computer operations**	Apply quality standards

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, pole, 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	**Manage energy consumption of facilities, equipment, and devices**	**Plan and support implementation of regular energy audit**	**Perform energy consumption monitoring and control**	**Carry out implementation & improvement of energy efficiency measures**	**Coordinate inventories and purchasing/sourcing of energy efficient equipment or devices**	**Install, operate, and maintain energy-consuming machines and equipment in facilities**
Supervise transmission line maintenance work						

GLOSSARY OF TERMS

GENERAL

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

2) **Certification -** is the process of verifying and validating the competencies of a person through assessment.

3) **Certificate of Competency (COC)** – is a certification issued to individuals who pass the assessment for a single unit or cluster of units of competency.

4) **Common Competencies** - are the skills and knowledge needed by all people working in a particular industry.

5) **Competency** - is the possession and application of knowledge, skills, and attitudes to perform work activities to the standard expected in the workplace.

6) **Competency Assessment -** is the process of collecting evidence and making judgments on whether competency has been achieved.

7) **Competency Standard (CS)** - is the industry-determined specification of competencies required for effective work performance.

8) **Context of Assessment** - refers to the place where assessment is to be conducted or carried out.

9) **Core Competencies -** are the specific skills and knowledge needed in a particular area of work - industry sector/occupation/job role.

10) **Critical aspects of competency -** refers to the evidence that is essential for successful performance of the unit of competency.

11) **Energy Performance Improvement**: Improvement in measurable results related to energy efficiency, energy use, or energy consumption compared to energy baseline. (Lifted from ISO 50001:2018).

12) **Energy Baseline** - quantitative reference providing a basis for comparison of energy performance. (Lifted from ISO 50001:2018)

13) **Energy efficiency** - ratio or other quantitative relationship between an output of performance, service, goods, commodities, or energy, and an input of energy. (Lifted from ISO 50001:2018)

14) **Energy Performance Indicator (EnPI)** - measure or unit of energy performance as defined by the organization. (Lifted from ISO 50001:2018)

15) **Elective Competencies -** are the additional skills and knowledge required by the individual or enterprise for work.

16) **Elements** - are the building blocks of a unit of competency. They describe in outcome terms the functions that a person performs in the workplace.

17) **Energy review** - analysis of energy efficiency, energy use and energy consumption based on data and other information, leading to identification of SEUs and opportunities for energy performance improvement. (Lifted from ISO 50001:2018)

18) **EPIA** - Energy performance improvement action.

19) **Evidence Guide** - is a component of the unit of competency that defines or identifies the evidence 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.

20) **Level -** refers to the category of skills and knowledge required to do a job.

21) **Measurement and Verification M&V** - process of planning, measuring, collecting data, analyzing, verifying, and reporting energy performance or energy performance improve for defined M & V boundaries.

22) **M & V Boundary** - organizational, physical, site, facility, equipment systems, processes or activity limits within energy performance or energy performance improvement is measured and verified.

23) **Method of Assessment** - refers to the ways of collecting evidence and when, evidence should be collected.

24) **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.

25) **Performance Criteria** - are evaluative statements that specify what is to be assessed and the required level of performance.

26) **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.

27) **Range of Variables** - describes the circumstances or context in which the work is to be performed.

28) **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.

29) **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.

30) **Significant Energy Use (SEU)** - energy use accounting for substantial energy consumption and/or offering considerable potential for energy performance improvement. (Lifted from ISO 50001:2018)

31) **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.

32) **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.

33) **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.

34) **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. **Analog instruments** are mechanical devices that indicate the magnitude of the quantity in the form of the pointer movement, and the value is read according to markings on a scale and gives an output that varies continuously as the quantity being measured changes.

2. **ASHRAE** - American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE ASH-ray) is an American professional association seeking to advance heating, ventilation, air conditioning and refrigeration (HVAC&R) systems design and construction. ASHRAE has more than 57,000 members in more than 132 countries worldwide.

3. **Calibration** is the comparison of measurement values delivered by a device under test with those of a calibration standard of known accuracy.

4. **Certified Energy Conservation Officer (CECO)** refers to a professional who obtains a certification as a CECO after demonstrating high levels of experience, competence, proficiency, and ethical fitness in the energy management profession, and who shall be responsible for the supervision and maintenance of the facilities of Type 1 designated establishments for the proper management of energy consumption and such other functions deemed necessary for the efficient and judicious utilization of energy under the Act;

5. **Certified Energy Manager (CEM)** refers to a licensed engineer who obtains a certification as a CEM after demonstrating high levels of experience, competence, proficiency, and ethical fitness in the energy management profession, and who shall be chosen by Type 2 designated establishments to plan, lead, manage, coordinate, monitor, and evaluate the implementation of sustainable energy management within their organizations.

6. **Designated Establishment** refers to a private or public entity in the commercial, industrial, transport, power, agriculture, public works, and other sectors identified by the DOE as energy intensive industries based on their annual energy consumption in the previous year or an equivalent annual index; the amount of consumption is indicated in the Act and subject to adjustment by the DOE as it deems necessary.

7. **Digital instrument** has an output that varies in discrete steps and so can have only a finite number of values.

8. **Distribution Utility** refers to any electric cooperative, private corporation, government-owned utility, or existing local government unit which has an exclusive franchise to operate a distribution system including those whose franchise covers economic zones.

9. **Energy** refers to all types of energy available commercially including natural gas (liquid natural gas and liquid oil gas), all heating and cooling fuels (including district heating and district cooling), coal, transport fuels, and renewable energy sources.

10. **Energy Accounting Center (EAC)** refers to an identified separate and distinct area of the organization for effective control and monitoring of energy consumption.

11. **Energy Audit** refers to the evaluation of energy consumption and review of current energy cost to determine appropriate intervention measures and efficiency projects in which energy can be judiciously and efficiently used to achieve savings.

12. **Energy audit report** – documents the results of an energy audit where it identifies energy consumed by a facility and locates energy conservation measures.

13. **Energy Conservation** refers to the reduction of losses or wastage in various energy stages from energy production to energy consumption through the adoption of appropriate measures which may, among others be, technologically feasible, economically sound, environmentally friendly, or socially affordable.

14. **Energy Conservation Measures (ECM)** refers to the upgrades, retrofits, repairs, and replacements that businesses can implement to become more energy efficient.

15. **Energy Consumption** is the amount of energy or power used and refers to energy used to perform an action, manufacture something or simply inhabit a building.

16. **Energy Efficiency** refers to the way of managing or restraining the growth in energy consumption resulting in the delivery of more services for the same energy input or the same services for less energy input.

17. **Energy Efficiency and Conservation Officer** (EEC Officer) refers to the head of the EECO responsible for overseeing the implementation of the Local EE&C Plan at the local government level, who may be designated from the existing personnel of the LGU.

18. **Energy Efficiency Index** - refers to an efficiency performance measure or indicator expressed as a ratio or index of energy utilization.

19. **Energy Efficiency Standards** - refers for the energy performance measurement used as an industry reference guide following extensive studies, benchmarking, best practices, and regulatory requirements.

20. **Energy Efficient Technologies** refers to technologies that use Energy efficiency as a means of measuring the energy-expenditure required to achieve a certain benefit. The lower the losses in energy in achieving a specific purpose, the higher are the degree of energy efficiency.

21. **Energy End User** refers to all individuals and entities, which consume energy to include households, industrial and commercial customers, power plants, distribution utilities, and transmission utilities.

22. **Energy Intensive Industries** are industries that use large amounts of energy such as iron and steel, cement, and pulp and paper.

23. **Energy Management** refers to the process of designing and/or implementing an optimal program of purchasing, generating, and consuming various types of energy based on the end user's overall short-term and long-term management program, with due consideration of factors including costs, availability, economics, and environmental impact.

24. **Energy Management System (EnMS)** - refers to a management system or process to manage the energy in the establishment following ISO 50001 requirements and guidance.

25. **Energy Performance Requirement** - refers to the standard or goal for energy performance required to be achieved for a period of time following regulatory requirements and/or business plans.

26. **Full Body Harness** - form of protective equipment designed to protect a person from injury due to falling.

27. **Hazard Control Measures** refer to measures that eliminate the hazards from the workplace to protect the workers and include wearing of appropriate Personal Protective Equipment (PPEs).

28. **Hazard Prevention** refers to effective controls to protect workers from workplace hazards; help avoid injuries, illnesses, and incidents; minimize or eliminate safety and health risks; and help employers provide workers with safe and healthful working conditions.

29. **Hazardous** - an atmosphere that may expose employees to the risk of death, atmosphere incapacitation, impaired ability to self-rescue unaided, injury, or acute illness.

30. **Hygrometer** is an instrument used to measure the amount of water vapor in air, in soil, or in confined spaces.

31. **Installation** is the act or process of making a machine, a service, etc., ready to be used in a certain place : the act of installing something (such as a piece of equipment end made ready for use.

32. **Inventory management system** (or inventory system) is the process by which you track your goods throughout your entire supply chain, from purchasing to production to end sales. It governs how you approach inventory management for your business.

33. **Minimum Energy Performance (MEP)** refers to a performance standard, which prescribes a minimum level of energy performance for energy-consuming products including appliances, lighting, electrical equipment, machinery, and transport vehicles that must be met or exceeded before they can be offered for sale or used for residential, commercial, transport, and industrial purposes.

34. **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.

35. **Operation and Maintenance (O&M)** means the functions, duties and labor associated with the daily operations and normal repairs, replacement of parts and structural components, and other activities needed to preserve an asset so that it continues to provide acceptable services and achieves its expected life.

36. **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.

37. **Philippine Qualifications Framework (PQF)** refers to a national policy describing the levels of educational qualifications and sets of standards for qualification outcomes. It is a quality assured national system for the development, recognition, and award of qualifications based on the standards of knowledge, skills, and values

acquired in different ways and methods by learners and workers. It is an assessment-based qualification recognition which is competency-based, and labor market driven.

38. **Record Monitoring System** involves collecting energy consumption data for each Energy Accounting Center (EAC).

39. **Repair and Maintenance** refers to those activities associated with the routine care and upkeep of a structure or an asset to keep it operating at its present condition.

40. **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.

41. **Safety protocols** refers to workplace safety protocols, often called safety procedures, are step-by-step safety plans guiding employees through the safe performance of a given workplace procedure.

42. **Specific Energy Consumption** refers to the energy consumption volume required per unit, such as production volume, sales amount, transportation kilometer, transportation ton-kilometer, floor space, and such other indicators relevant to energy consumption.

43. **Technology Adaptability** is the ability to learn technology quickly and with confidence.

44. **Transmission Utility** refers to any private corporation or government-owned utility which has an exclusive franchise to operate the system of wires for the conveyance of electricity through a high voltage backbone line.

45. **Transport Vehicle** refers to land, air, or sea vehicles conveying cargo or passengers, regardless of size or weight classification.

46. **Voltage Detector**- is a sensor used to detect presence of electricity in a wire.

REFERENCES:

- Republic Act 11285, Energy Efficiency and Conservation Act (EECA)
- Republic Act. No. 9136 or EPIRA
- EPIRA IRR
- Administrative Order No. 110 – Directing the Institutionalization of a Government Energy Management Program (GEMP) (from OP)
- DOE DC No. 2019-11-0014 Implementing Rules and Regulations of RA 11285, EEC-IRR
- DOE DC2014-08-0014 – Enjoining all Electricity-Consuming Sectors to Implement Demand-Side Management Program and other Conservation Measures
- DOE MC2020-05-0001 – Compliance of Designated Establishments
- DOE DC2020-09-0018 – ESCO Guidelines
- DOE DC2020-12-0026 – Guidelines on Energy Conserving Design on Buildings
- ASHRAE Standards for Ventilation System Design and Acceptable Indoor Air Quality (IAQ)
- Philippine Green Building Code
- Philippine Electrical Code
- Philippine Mechanical Code
- ISO 50001 (2018) Energy Management System (EnMS) - Requirements with Guidance for Use
- ISO 50002 (2014) Energy Audits - Requirements with Guidance for Use
- ISO 14000 Environmental Management Standards
- ISO 18000 Occupational Health and Safety Standards
- ISO 50006 (2014) provides guidance to organizations on how to establish, use and maintain energy performance indicators (EnPIs) and energy baselines (EnBs) as part of the process of measuring energy performance
- ISO 50015 (2014) establishes general principles and guidelines for the process of measurement and verification (M&V) of energy performance of an organization or its components. ISO 50015:2014 can be used independently, or in conjunction with other standards or protocols, and can be applied to all types of energy

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