

COMPETENCY STANDARDS



SOLAR POWERED IRRIGATION SYSTEM (SPIS) OPERATION AND MAINTENANCE LEVEL II

**AGRICULTURE, FORESTRY AND FISHERY
(AFF) SECTOR**

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY

East Service Road, South Luzon Expressway (SLEX), Fort Bonifacio, Taguig City, Metro Manila

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**COMPETENCY STANDARDS FOR
SOLAR POWERED IRRIGATION SYSTEM OPERATION AND MAINTENANCE
LEVEL II**

**Section 1 SOLAR POWERED IRRIGATION SYSTEM OPERATION AND
MAINTENANCE LEVEL II**

The **SOLAR POWERED IRRIGATION SYSTEM OPERATION AND MAINTENANCE LEVEL II** Qualification consists of competencies that a person must achieve to operate and maintain surrounding facilities of SPIS, operate and maintain SPIS components and accessories and implement water distribution. Practice of safety measures and proper handling of tools and equipment are also required for a competent performance.

This Qualification is packaged from the competency map of the Agriculture, Forestry and Fishery Sector as shown in Annex A.

The units of competency comprising this qualification include the following:

| Code | BASIC COMPETENCIES |
|-------------|---|
| 400311210 | Participate in workplace communication |
| 400311211 | Work in team environment |
| 400311212 | Solve/address general workplace problems |
| 400311213 | Develop career and life decisions |
| 400311214 | Contribute to workplace innovation |
| 400311215 | Present relevant information |
| 400311216 | Practice occupational safety and health policies and procedures |
| 400311217 | Exercise efficient and effective sustainable practices in the workplace |
| 400311218 | Practice entrepreneurial skills in the workplace |
| Code | COMMON COMPETENCIES |
| CON931201 | Prepare construction materials and tools |
| CON311201 | Observe procedures, specifications and manuals of instruction |
| CON311203 | Perform mensuration and calculations |
| CON311204 | Maintain tools and equipment |
| Code | CORE COMPETENCIES |
| XXXXXXXXXX | Operate and maintain surrounding facilities of SPIS |
| XXXXXXXXXX | Operate and maintain SPIS components and accessories |
| XXXXXXXXXX | Implement water distribution |

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

- **SOLAR POWERED IRRIGATION SYSTEM (SPIS) OPERATOR AND MAINTENANCE OFFICER**

SECTION 2

COMPETENCY STANDARDS

These guidelines are set to provide the Technical Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for **SOLAR POWERED IRRIGATION SYSTEM OPERATION AND MAINTENANCE LEVEL II**.

BASIC COMPETENCIES

UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : 400311210

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

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|--|---|--|---|
| 1. Obtain and convey workplace information | 1.1 Specific and relevant information is accessed from appropriate sources 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate medium is used to transfer information and ideas 1.4 Appropriate non-verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and storage of information are used | 1.1 Effective verbal and nonverbal communication 1.2 Different modes of communication 1.3 Medium of communication in the workplace 1.4 Organizational policies 1.5 Communication procedures and systems 1.6 Lines of Communication 1.7 Technology relevant to the enterprise and the individual's work responsibilities 1.8 Workplace etiquette | 1.1 Following simple spoken language 1.2 Performing routine workplace duties following simple written notices 1.3 Participating in workplace meetings and discussions 1.4 Preparing work-related documents 1.5 Estimating, calculating and recording routine workplace measures 1.6 Relating/ Interacting with people of various levels in the workplace 1.7 Gathering and providing basic information in |

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|--|---|---|---|
| | 1.7 Personal interaction is carried out clearly and concisely | | response to workplace requirements 1.8 Basic business writing skills 1.9 Interpersonal skills in the workplace 1.10 Active-listening skills |
| 2. Perform duties following workplace instructions | 2.1 Written notices and instructions are read and interpreted in accordance with organizational guidelines 2.2 Routine written instruction are followed based on established procedures 2.3 Feedback is given to workplace supervisor based instructions/ information received 2.4 Workplace interactions are conducted in a courteous manner 2.5 Where necessary, clarifications about routine workplace procedures and matters concerning conditions of employment are sought and asked from appropriate sources 2.6 Meetings outcomes are interpreted and implemented | 2.1 Effective verbal and non-verbal communication 2.2 Different modes of communication 2.3 Medium of communication in the workplace 2.4 Organizational/ Workplace policies 2.5 Communication procedures and systems 2.6 Lines of communication 2.7 Technology relevant to the enterprise and the individual's work responsibilities 2.8 Effective questioning techniques (clarifying and probing) 2.9 Workplace etiquette | 2.1 Following simple spoken instructions 2.2 Performing routine workplace duties following simple written notices 2.3 Participating in workplace meetings and discussions 2.4 Completing work-related documents 2.5 Estimating, calculating and recording routine workplace measures 2.6 Relating/ Responding to people of various levels in the workplace 2.7 Gathering and providing information in response to workplace requirements 2.8 Basic questioning/ querying 2.9 Skills in reading for information 2.10 Skills in locating |

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|---|---|--|--|
| 3. Complete relevant work related documents | 3.1 Range of forms relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Errors in recording information on forms/ documents are identified and acted upon 3.4 Reporting requirements to supervisor are completed according to organizational guidelines | 3.1 Effective verbal and non-verbal communication 3.2 Different modes of communication 3.3 Workplace forms and documents 3.4 Organizational/ Workplace policies 3.5 Communication procedures and systems 3.6 Technology relevant to the enterprise and the individual's work responsibilities | 3.1 Completing work-related documents 3.2 Applying operations of addition, subtraction, division and multiplication 3.3 Gathering and providing information in response to workplace requirements 3.4 Effective record keeping skills |

RANGE OF VARIABLES

| VARIABLES | RANGE |
|---------------------------|--|
| 1. Appropriate sources | May include: 1.1. Team members 1.2. Supervisor/Department Head 1.3. Suppliers 1.4. Trade personnel 1.5. Local government 1.6. Industry bodies |
| 2. Medium | May include: 2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information dissemination 2.5. Follow-up or verbal instructions 2.6. Face-to-face communication 2.7. Electronic media (disk files, cyberspace) |
| 3. Storage | May include: 3.1. Manual filing system 3.2. Computer-based filing system |
| 4. Workplace interactions | May include: 4.1. Face-to-face 4.2. Telephone 4.3. Electronic and two-way radio 4.4. Written including electronic means, memos, instruction and forms 4.5. Non-verbal including gestures, signals, signs and diagrams |
| 5. Forms | May include: 5.1. HR/Personnel forms, telephone message forms, safety reports |

EVIDENCE GUIDE

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|-----------------------------------|--|
| 1. Critical aspects of Competency | <p>Assessment requires evidence that the candidate:</p> <p>1.1. Prepared written communication following standard format of the organization</p> <p>1.2. Accessed information using workplace communication equipment/systems</p> <p>1.3. Made use of relevant terms as an aid to transfer information effectively</p> <p>1.4. Conveyed information effectively adopting formal or informal communication</p> |
| 2. Resource Implications | <p>The following resources should be provided:</p> <p>2.1. Fax machine</p> <p>2.2. Telephone</p> <p>2.3. Notebook</p> <p>2.4. Writing materials</p> <p>2.5. Computer with Internet connection</p> |
| 3. Methods of Assessment | <p>Competency in this unit may be assessed through:</p> <p>3.1. Demonstration with oral questioning</p> <p>3.2. Interview</p> <p>3.3. Written test</p> <p>3.4. Third-party report</p> |
| 4. Context for Assessment | <p>4.1. Competency may be assessed individually in the actual workplace or through an accredited institution</p> |

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

UNIT CODE : **400311211**

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

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|---|---|--|---|
| 1. Describe team role and scope | 1.1 The <i>role and objective of the team</i> is identified from available <i>sources of information</i> 1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources | 1.1 Group structure 1.2 Group development 1.3 Sources of information | 1.1 Communicating with others, appropriately consistent with the culture of the workplace 1.2 Developing ways in improving work structure and performing respective roles in the group or organization |
| 2. Identify one's role and responsibility within a team | 2.1 Individual roles and responsibilities within the team environment are identified 2.2 Roles and objectives of the team is identified from available <i>sources of information</i> 2.3 Team parameters, reporting relationships and responsibilities are identified based on team discussions and appropriate external sources | 2.1 Team roles and objectives 2.2 Team structure and parameters 2.3 Team development 2.4 Sources of information | 2.1 Communicating with others, appropriately consistent with the culture of the workplace 2.2 Developing ways in improving work structure and performing respective roles in the group or organization |
| 3. Work as a team member | 3.1 Effective and appropriate forms of communications are used and interactions undertaken with team members based on company practices. 3.2 Effective and appropriate | 3.1 Communication Process 3.2 Workplace communication protocol 3.3 Team planning and decision making | 3.1 Communicating appropriately, consistent with the culture of the workplace 3.2 Interacting effectively with others 3.3 Deciding as an |

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|---------|--|--|---|
| | <p>contributions made to complement team activities and objectives, based on <i>workplace context</i></p> <p>3.3 Protocols in reporting are observed based on standard company practices.</p> <p>3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives</p> | <p>3.4 Team thinking</p> <p>3.5 Team roles</p> <p>3.6 Process of team development</p> <p>3.7 Workplace context</p> | <p>individual and as a group using group think strategies and techniques</p> <p>3.4 Contributing to Resolution of issues and concerns</p> |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|-------------------------------|--|
| 1. Role and objective of team | May include but not limited to: 1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment |
| 2. Sources of information | May include but not limited to: 2.1. Standard operating and/or other workplace procedures 2.2. Job procedures 2.3. Machine/equipment manufacturer's specifications and instructions 2.4. Organizational or external personnel 2.5. Client/supplier instructions 2.6. Quality standards 2.7. OHS and environmental standards |
| 3. Workplace context | May include but not limited to: 3.1. Work procedures and practices 3.2. Conditions of work environments 3.3. Legislation and industrial agreements 3.4. Standard work practice including the storage, safe handling and disposal of chemicals 3.5. Safety, environmental, housekeeping and quality guidelines |

EVIDENCE GUIDE

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|-----------------------------------|---|
| 1. Critical aspects of Competency | <p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Worked in a team to complete workplace activity 1.2 Worked effectively with others 1.3 Conveyed information in written or oral form 1.4 Selected and used appropriate workplace language 1.5 Followed designated work plan for the job |
| 2. Resource Implications | <p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks |
| 3. Methods of Assessment | <p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Role play involving the participation of individual member to the attainment of organizational goal 3.2 Case studies and scenarios as a basis for discussion of issues and strategies in teamwork 3.3 Socio-drama and socio-metric methods 3.4 Sensitivity techniques 3.5 Written Test |
| 4. Context for Assessment | <ul style="list-style-type: none"> 4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while task are being undertaken whether individually or in group |

UNIT OF COMPETENCY : SOLVE/ADDRESS GENERAL WORKPLACE PROBLEMS

UNIT COD : 400311212

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to apply problem-solving techniques to determine the origin of problems and plan for their resolution. It also includes addressing procedural problems through documentation, and referral.

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|---|---|--|--|
| 1. Identify routine problems | 1.1 Routine problems or procedural problem areas are identified 1.2 Problems to be investigated are defined and determined 1.3 Current conditions of the problem are identified and documented | 1.1 Current industry hardware and software products and services 1.2 Industry maintenance, service and helpdesk practices, processes and procedures 1.3 Industry standard diagnostic tools 1.4 Malfunctions and resolutions | 1.1 Identifying current industry hardware and software products and services 1.2 Identifying current industry maintenance, services and helpdesk practices, processes and procedures. 1.3 Identifying current industry standard diagnostic tools 1.4 Describing common malfunctions and resolutions. 1.5 Determining the root cause of a routine malfunction |
| 2. Look for solutions to routine problems | 2.1 Potential solutions to problem are identified 2.2 Recommendations about possible solutions are developed, documented , ranked and presented to appropriate person for decision | 2.1 Current industry hardware and software products and services 2.2 Industry service and helpdesk practices, processes and procedures 2.3 Operating systems 2.4 Industry standard diagnostic tools 2.5 Malfunctions and | 2.1 Identifying current industry hardware and software products and services 2.2 Identifying services and helpdesk practices, processes and procedures. 2.3 Identifying operating system 2.4 Identifying current |

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|------------------------------------|---|--|--|
| | | resolutions. 2.6 Root cause analysis | industry standard diagnostic tools 2.5 Describing common malfunctions and resolutions. 2.6 Determining the root cause of a routine malfunction |
| 3. Recommend solutions to problems | 3.1 Implementation of solutions are planned 3.2 Evaluation of implemented solutions are planned 3.3 Recommended solutions are documented and submit to appropriate person for confirmation | 3.1 Standard procedures 3.2 Documentation produce | 3.1 Producing documentation that recommends solutions to problems 3.2 Following established procedures |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|--------------------------------|---|
| 1. Problems/Procedural Problem | May include but not limited to: 1.1 Routine/non – routine processes and quality problems 1.2 Equipment selection, availability and failure 1.3 Teamwork and work allocation problem 1.4 Safety and emergency situations and incidents 1.5 Work-related problems outside of own work area |
| 2. Appropriate person | May include but not limited to: 2.1 Supervisor or manager 2.2 Peers/work colleagues 2.3 Other members of the organization |
| 3. Document | May include but not limited to: 3.1 Electronic mail 3.2 Briefing notes 3.3 Written report 3.4 Evaluation report |
| 4. Plan | May include but not limited to: 4.1 Priority requirements 4.2 Co-ordination and feedback requirements 4.3 Safety requirements 4.4 Risk assessment 4.5 Environmental requirements |

EVIDENCE GUIDE

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| <p>1. Critical aspects of Competency</p> | <p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Determined the root cause of a routine problem 1.2 Identified solutions to procedural problems. 1.3 Produced documentation that recommends solutions to problems. 1.4 Followed established procedures. 1.5 Referred unresolved problems to support persons. |
| <p>2. Resource Implications</p> | <p>2.1. Assessment will require access to a workplace over an extended period, or a suitable method of gathering evidence of operating ability over a range of situations.</p> |
| <p>3. Methods of Assessment</p> | <p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Case Formulation 3.2 Life Narrative Inquiry 3.3 Standardized test <p>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.</p> |
| <p>4. Context for Assessment</p> | <p>4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.</p> |

UNIT OF COMPETENCY : DEVELOP CAREER AND LIFE DECISIONS

UNIT CODE : 400311213

UNIT DESCRIPTOR : This unit covers the knowledge, skills, and attitudes in managing one’s emotions, developing reflective practice, and boosting self-confidence and developing self-regulation.

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|--------------------------------|---|--|---|
| 1. Manage one’s emotion | 1.1 Self-management strategies are identified 1.2 Skills to work independently and to show initiative, to be conscientious, and persevering in the face of setbacks and frustrations are developed 1.3 Techniques for effectively handling negative emotions and unpleasant situation in the workplace are examined | 1.1 Self-management strategies that assist in regulating behavior and achieving personal and learning goals (e.g. Nine self-management strategies according to Robert Kelley) 1.2 Enablers and barriers in achieving personal and career goals 1.3 Techniques in handling negative emotions and unpleasant situation in the workplace such as frustration, anger, worry, anxiety, etc. | 1.1 Managing properly one’s emotions and recognizing situations that cannot be changed and accept them and remain professional 1.2 Developing self-discipline, working independently and showing initiative to achieve personal and career goals 1.3 Showing confidence, and resilience in the face of setbacks and frustrations and other negative emotions and unpleasant situations in the workplace |
| 2. Develop reflective practice | 2.1 Personal strengths and achievements, based on self-assessment strategies and teacher feedback are contemplated 2.2 Progress when seeking and responding to | 2.1 Basic SWOT analysis 2.2 Strategies to improve one’s attitude in the workplace 2.3 Gibbs’ Reflective Cycle/Model (Description, Feelings, | 2.1 Using the basic SWOT analysis as self-assessment strategy 2.2 Developing reflective practice through realization of limitations, likes/ |

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|---|---|---|--|
| | <p>feedback from teachers to assist them in consolidating strengths, addressing weaknesses and fulfilling their potential are monitored</p> <p>2.3 Outcomes of personal and academic challenges by reflecting on previous problem solving and decision making strategies and feedback from peers and teachers are predicted</p> | <p>Evaluation, Analysis, Conclusion, and Action plan)</p> | <p>dislikes; through showing of self-confidence</p> <p>2.3 Demonstrating self-acceptance and being able to accept challenges</p> |
| <p>3. Boost self-confidence and develop self-regulation</p> | <p>3.1 Efforts for continuous self-improvement are demonstrated</p> <p>3.2 Counter-productive tendencies at work are eliminated</p> <p>3.3 Positive outlook in life are maintained.</p> | <p>3.1 Four components of self-regulation based on Self-Regulation Theory (SRT)</p> <p>3.2 Personality development concepts</p> <p>3.3 Self-help concepts (e. g., 7 Habits by Stephen Covey, transactional analysis, psycho-spiritual concepts)</p> | <p>3.1 Performing effective communication skills – reading, writing, conversing skills</p> <p>3.2 Showing affective skills – flexibility, adaptability, etc.</p> <p>3.3 Self-assessment for determining one’s strengths and weaknesses</p> |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|-------------------------------|--|
| 1. Self-management strategies | May include but not limited to: 1.1 Seeking assistance in the form of job coaching or mentoring 1.2 Continuing dialogue to tackle workplace grievances 1.3 Collective negotiation/bargaining for better working conditions 1.4 Share your goals to improve with a trusted co-worker or supervisor 1.5 Make a negativity log of every instance when you catch yourself complaining to others 1.6 Make lists and schedules for necessary activities |
| 2. Unpleasant situation | May include but not limited to: 2.1 Job burn-out 2.2 Drug dependence 2.3 Sulking |

EVIDENCE GUIDE

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|-----------------------------------|---|
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate: 1.1 Express emotions appropriately 1.2 Work independently and show initiative 1.3 Consistently demonstrate self-confidence and self-discipline |
| 2. Resource Implications | The following resources should be provided: 2.1. Access to workplace and resource s 2.2. Case studies |
| 3. Methods of Assessment | Competency in this unit may be assessed through: 3.1. Demonstration or simulation with oral questioning 3.2. Case problems involving work improvement and sustainability issues 3.3. Third-party report |
| 4. Context for Assessment | 4.1. Competency assessment may occur in workplace or any appropriately simulated environment |

UNIT OF COMPETENCY : **CONTRIBUTE TO WORKPLACE INNOVATION**

UNIT CODE : **400311214**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and Attitudes required to make a pro-active and positive contribution to workplace innovation.

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|--|--|---|---|
| 1. Identify opportunities to do things better. | 1.1 Opportunities for improvement are identified proactively in own area of work. 1.2 Information are gathered and reviewed which may be relevant to ideas and which might assist in gaining support for idea. | 1.1 Roles of individuals in suggesting and making improvements. 1.2 Positive impacts and challenges in innovation. 1.3 Types of changes and responsibility. 1.4 Seven habits of highly effective people. | 1.1 Identifying opportunities to improve and to do things better. Involvement. 1.2 Identifying the positive impacts and the challenges of change and innovation. 1.3 Identifying examples of the types of changes that are within and outside own scope of responsibility |
| 2. Discuss and develop ideas with others | 2.1 People who could provide input to ideas for improvements are identified. 2.2 Ways of approaching people to begin sharing ideas are selected. 2.3 Meeting is set with relevant people. 2.4 Ideas for follow up are review and selected based on feedback. 2.5 Critical inquiry method is used to discuss and develop ideas with others. | 2.1 Roles of individuals in suggesting and making improvements. 2.2 Positive impacts and challenges in innovation. 2.3 Types of changes and responsibility. 2.4 Seven habits of highly effective people. | 2.1 Identifying opportunities to improve and to do things better. Involvement. 2.2 Identifying the positive impacts and the challenges of change and innovation. 2.3 Providing examples of the types of changes that are within and outside own scope of responsibility 2.4 Communicating ideas for change through small group discussions and meetings. |
| 3. Integrate ideas for change in the workplace | 3.1 Critical inquiry method is used to integrate different ideas for change of key people. | 3.1 Roles of individuals in suggesting and making improvements. | 3.1 Identifying opportunities to improve and to do things better. Involvement. |

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|----------|---|---|---|
| | <p>3.2 Summarizing, analyzing and generalizing skills are used to extract salient points in the pool of ideas.</p> <p>3.3 Reporting skills are likewise used to communicate results.</p> <p>3.4 Current Issues and concerns on the systems, processes and procedures, as well as the need for simple innovative practices are identified.</p> | <p>3.2 Positive impacts and challenges in innovation.</p> <p>3.3 Types of changes and responsibility.</p> <p>3.4 Seven habits of highly effective people.</p> <p>3.5 Basic research skills.</p> | <p>3.2 Identifying the positive impacts and the challenges of change and innovation.</p> <p>3.3 Providing examples of the types of changes that are within and outside own scope of responsibility.</p> <p>3.4 Communicating ideas for change through small group discussions and meetings.</p> <p>3.5 Demonstrating skills in analysis and interpretation of data.</p> |

RANGE OF VARIABLES

| VARIABLES | RANGE |
|-----------------------------------|--|
| 1. Opportunities for improvement | May include: 1.1 Systems. 1.2 Processes. 1.3 Procedures. 1.4 Protocols. 1.5 Codes. 1.6 Practices. |
| 2. Information | May include: 2.1 Workplace communication problems. 2.2 Performance evaluation results. 2.3 Team dynamics issues and concerns. 2.4 Challenges on return of investment 2.5 New tools, processes and procedures. 2.6 New people in the organization. |
| 3. People who could provide input | May include: 3.1 Leaders. 3.2 Managers. 3.3 Specialists. 3.4 Associates. 3.5 Researchers. 3.6 Supervisors. 3.7 Staff. 3.8 Consultants (external) 3.9 People outside the organization in the same field or similar expertise/industry. 3.10 Clients |
| 4. Critical inquiry method | May include: 4.1 Preparation. 4.2 Discussion. 4.3 Clarification of goals. 4.4 Negotiate towards a Win-Win outcome. 4.5 Agreement. 4.6 Implementation of a course of action. 4.7 Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 4.8 Listening. 4.9 Reducing misunderstandings is a key part of effective negotiation. 4.10 Rapport Building. 4.11 Problem Solving. 4.12 Decision Making. 4.13 Assertiveness. 4.14 Dealing with Difficult Situations. |

| VARIABLES | RANGE |
|---------------------|--|
| 5. Reporting skills | May include: 5.1 Data management. 5.2 Coding. 5.3 Data analysis and interpretation. 5.4 Coherent writing. 5.5 Speaking. |

EVIDENCE GUIDE

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|-----------------------------------|---|
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate: 1.1 Identified opportunities to do things better. 1.2 Discussed and developed ideas with others on how to contribute to workplace innovation. 1.3 Integrated ideas for change in the workplace. 1.4 Analyzed and reported rooms for innovation and learning in the workplace. |
| 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 : PRESENT RELEVANT INFORMATION

UNIT CODE : 400311215

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and attitudes required to present data/information appropriately.

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|-------------------------------------|---|--|---|
| 1. Gather data/information | 1.1 Evidence, facts and information are collected 1.2 Evaluation, terms of reference and conditions are reviewed to determine whether data/information falls within project scope | 1.1 Organisational protocols 1.2 Confidentiality 1.3 Accuracy 1.4 Business mathematics and statistics 1.5 Data analysis techniques/procedures 1.6 Reporting requirements to a range of audiences 1.7 Legislation, policy and procedures relating to the conduct of evaluations 1.8 Organisational values, ethics and codes of conduct | 1.1 Describing organisational protocols relating to client liaison 1.2 Protecting confidentiality 1.3 Describing accuracy 1.4 Computing business mathematics and statistics 1.5 Describing data analysis techniques/procedures 1.6 Reporting requirements to a range of audiences 1.7 Stating legislation, policy and procedures relating to the conduct of evaluations 1.8 Stating organisational values, ethics and codes of conduct |
| 2. Assess gathered data/information | 2.1 Validity of data/information is assessed 2.2 Analysis techniques are applied to assess data/information. 2.3 Trends and anomalies are identified 2.4 Data analysis techniques and | 2.1 Business mathematics and statistics 2.2 Data analysis techniques/procedures 2.3 Reporting requirements to a range of audiences 2.4 Legislation, policy and procedures relating to the | 2.1 Computing business mathematics and statistics 2.2 Describing data analysis techniques/procedures 2.3 Reporting requirements to a range of audiences |

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|--|---|---|--|
| | <p>procedures are documented</p> <p>2.5 Recommendations are made on areas of possible improvement.</p> | <p>conduct of evaluations</p> <p>2.5 Organisational values, ethics and codes of conduct</p> | <p>2.4 Stating legislation, policy and procedures relating to the conduct of evaluations</p> <p>2.5 Stating organisational values, ethics and codes of conduct</p> |
| <p>3. Record and present information</p> | <p>3.1 Studied data/information are recorded.</p> <p>3.2 Recommendations are analysed for action to ensure they are compatible with the project's scope and terms of reference.</p> <p>3.3 Interim and final reports are analysed and outcomes are compared to the criteria established at the outset.</p> <p>3.4 Findings are presented to stakeholders.</p> | <p>3.1 Data analysis techniques/procedures</p> <p>3.2 Reporting requirements to a range of audiences</p> <p>3.3 Legislation, policy and procedures relating to the conduct of evaluations</p> <p>3.4 Organisational values, ethics and codes of conduct</p> | <p>3.1 Describing data analysis techniques/procedures</p> <p>3.2 Reporting requirements to a range of audiences</p> <p>3.3 Stating legislation, policy and procedures relating to the conduct of evaluations</p> <p>3.4 Stating organisational values, ethics and codes of conduct practices</p> |

RANGE OF VARIABLES

| VARIABLES | RANGE |
|-----------------------------|---|
| 1. Data analysis techniques | May include but not limited to: 1.1. Domain analysis 1.2. Content analysis 1.3. Comparison technique |

EVIDENCE GUIDE

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|-----------------------------------|--|
| 1. Critical aspects of Competency | <p>Assessment requires evidence that the candidate:</p> <p>1.1 Determine data / information 1.2 Studied and applied gathered data/information 1.3 Recorded and studied studied data/information</p> <p>These aspects may be best assessed using a range of scenarios what ifs as a stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.</p> |
| 2. Resource Implications | <p>Specific resources for assessment</p> <p>2.1 Evidence of competent performance should be obtained by observing an individual in an information management role within the workplace or operational or simulated environment.</p> |
| 3. Methods of Assessment | <p>Competency in this unit may be assessed through:</p> <p>3.1 Written Test 3.2 Interview 3.3 Portfolio</p> <p>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.</p> |
| 4. Context for Assessment | <p>4.1 In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.</p> |

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

UNIT CODE : 400311216

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to identify OSH compliance requirements, prepare OSH requirements for compliance, perform tasks in accordance with relevant OSH policies and procedures

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|--|---|--|---|
| 1. Identify OSH compliance requirements | 1.1 Relevant OSH requirements, regulations, policies and procedures are identified in accordance with workplace policies and procedures 1.2 OSH activity non-conformities are conveyed to appropriate personnel 1.3 OSH preventive and control requirements are identified in accordance with OSH work policies and procedures | 1.1. OSH preventive and control requirements 1.2. Hierarchy of Controls 1.3. Hazard Prevention and Control 1.4. General OSH principles 1.5. Work standards and procedures 1.6. Safe handling procedures of tools, equipment and materials 1.7. Standard emergency plan and procedures in the workplace | 1.1. Communication skills 1.2. Interpersonal skills 1.3. Critical thinking skills 1.4. Observation skills |
| 2. Prepare OSH requirements for compliance | 2.1 OSH work activity material, tools and equipment requirements are identified in accordance with workplace policies and procedures 2.2. Required OSH materials, tools and equipment are acquired in accordance with workplace policies | 2.1. Resources necessary to execute hierarchy of controls 2.2. General OSH principles 2.3. Work standards and procedures 2.4. Safe handling procedures of tools, equipment and materials 2.5. Different OSH control measures | 2.1. Communication skills 2.2. Estimation skills 2.3. Interpersonal skills 2.4. Critical thinking skills 2.5. Observation skills 2.6. Material, tool and equipment identification skills |

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|--|---|---|--|
| | and procedures 2.3. Required OSH materials, tools and equipment are arranged/ placed in accordance with OSH work standards | | |
| 3. Perform tasks in accordance with relevant OSH policies and procedures | 3.1 Relevant OSH work procedures are identified in accordance with workplace policies and procedures 3.2 Work Activities are executed in accordance with OSH work standards 3.3 <i>Non-compliance work activities</i> are reported to <i>appropriate personnel</i> | 3.1. OSH work standards 3.2. Industry related work activities 3.3. General OSH principles 3.4. OSH Violations Non-compliance work activities | 3.1 Communication skills 3.3 Interpersonal skills 3.4 Troubleshooting skills 3.5 Critical thinking skills 3.6 Observation skills |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|---|--|
| 1. OSH Requirements, Regulations, Policies and Procedures | May include: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Permit to Operate 1.6 Philippine Occupational Safety and Health Standards 1.7 Department Order No. 13 (Construction Safety and Health) 1.8 ECC regulations |
| 2. Appropriate Personnel | May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself |
| 3. OSH Preventive and Control Requirements | May include: 3.1 Resources needed for removing hazard effectively 3.2 Resources needed for substitution or replacement 3.3 Resources needed to establishing engineering controls 3.4 Resources needed for enforcing administrative controls 3.5 Personal Protective equipment |
| 4. Non OSH-Compliance Work Activities | May include non-compliance or observance of the following safety measures: 4.1 Violations that may lead to serious physical harm or death 4.2 Fall Protection 4.3 Hazard Communication 4.4 Respiratory Protection 4.5 Power Industrial Trucks 4.6 Lockout/Tag-out 4.7 Working at heights (use of ladder, scaffolding) 4.8 Electrical Wiring Methods 4.9 Machine Guarding 4.10 Electrical General Requirements 4.11 Asbestos work requirements 4.12 Excavations work requirements |

EVIDENCE GUIDE

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|-----------------------------------|---|
| 1. Critical aspects of Competency | <p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1. Convey OSH work non-conformities to appropriate personnel 1.2. Identify OSH preventive and control requirements in accordance with OSH work policies and procedures 1.3. Identify OSH work activity material, tools and equipment requirements in accordance with workplace policies and procedures 1.4. Arrange/Place required OSH materials, tools and equipment in accordance with OSH work standards 1.5. Execute work activities in accordance with OSH work standards 1.6. Report OSH activity non-compliance work activities to appropriate personnel |
| 2. Resource Implications | <p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Facilities, materials tools and equipment necessary for the activity |
| 3. Methods of Assessment | <p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation/Demonstration with oral questioning 3.2 Third party report |
| 4. Context for Assessment | <ul style="list-style-type: none"> 4.1 Competency may be assessed in the work place or in a simulated work place setting |

UNIT OF COMPETENCY : EXERCISE EFFICIENT AND EFFECTIVE SUSTAINABLE PRACTICES IN THE WORKPLACE

UNIT CODE : 400311217

UNIT DESCRIPTOR This unit covers knowledge, skills and attitude to identify : the efficiency and effectiveness of resource utilization, determine causes of inefficiency and/or ineffectiveness of resource utilization and Convey inefficient and ineffective environmental practices

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|--|---|--|--|
| 1. Identify the efficiency and effectiveness of resource utilization | 1.1 Required resource utilization in the workplace is measured using appropriate techniques 1.2 Data are recorded in accordance with workplace protocol 1.3 Recorded data are compared to determine the efficiency and effectiveness of resource utilization according to established <i>environmental work procedures</i> | 1.1 Importance of Environmental Literacy 1.2 Environmental Work Procedures 1.3 Waste Minimization 1.4 Efficient Energy Consumptions | 1.1 Recording Skills 1.2 Writing Skills 1.3 Innovation Skills |
| 2. Determine causes of inefficiency and/or ineffectiveness of resource utilization | 2.1 Potential causes of inefficiency and/or ineffectiveness are listed 2.2 Causes of inefficiency and/or ineffectiveness are identified through deductive reasoning 2.3 Identified causes of inefficiency and/or ineffectiveness are validated thru established environmental procedures | 2.1 Causes of environmental inefficiencies and ineffectiveness | 2.1 Deductive Reasoning Skills 2.2 Critical thinking 2.3 Problem Solving 2.4 Observation Skills |

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|---|--|--|---|
| 3. Convey inefficient and ineffective environmental practices | 3.1 Efficiency and effectiveness of resource utilization are reported to <i>appropriate personnel</i> 3.2 Concerns related resource utilization are discussed with appropriate personnel 3.3 Feedback on information/ concerns raised are clarified with appropriate personnel | 3.1 Appropriate Personnel to address the environmental hazards 3.2 Environmental corrective actions | 3.1 Written and Oral Communication Skills 3.2 Critical thinking 3.3 Problem Solving 3.4 Observation Skills 3.5 Practice Environmental Awareness |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|----------------------------------|---|
| 1. Environmental Work Procedures | May include: 1.1 Utilization of Energy, Water, Fuel Procedures 1.2 Waster Segregation Procedures 1.3 Waste Disposal and Reuse Procedures 1.4 Waste Collection Procedures 1.5 Usage of Hazardous Materials Procedures 1.6 Chemical Application Procedures 1.7 Labeling Procedures |
| 2. Appropriate Personnel | May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself |

EVIDENCE GUIDE

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|--|---|
| <p>1. Critical aspects of Competency</p> | <p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Measured required resource utilization in the workplace using appropriate techniques 1.2 Recorded data in accordance with workplace protocol 1.3 Identified causes of inefficiency and/or ineffectiveness through deductive reasoning 1.4 Validate the identified causes of inefficiency and/or ineffectiveness thru established environmental procedures 1.5 Report efficiency and effectiveness of resource utilization to appropriate personnel 1.6 Clarify feedback on information/concerns raised with appropriate personnel |
| <p>2. Resource Implications</p> | <p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace 2.2 Tools, materials and equipment relevant to the tasks 2.3 PPE 2.4 Manuals and references |
| <p>3. Methods of Assessment</p> | <p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Demonstration 3.2 Oral questioning 3.3 Written examination |
| <p>4. Context for Assessment</p> | <ul style="list-style-type: none"> 4.1 Competency assessment may occur in workplace or any appropriately simulated environment 4.2 Assessment shall be observed while task are being undertaken whether individually or in-group |

UNIT OF COMPETENCY : PRACTICE ENTREPRENEURIAL SKILLS IN THE WORKPLACE

UNIT CODE : 400311218

UNIT DESCRIPTOR : This unit covers the outcomes required to apply entrepreneurial workplace best practices and implement cost-effective operations

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|---|--|--|---|
| 1. Apply entrepreneurial workplace best practices | 1.1 Good practices relating to workplace operations are observed and selected following workplace policy. 1.2 Quality procedures and practices are complied with according to workplace requirements. 1.3 Cost-conscious habits in resource utilization are applied based on industry standards. | 1.1 Workplace best practices, policies and criteria 1.2 Resource utilization 1.3 Ways in fostering entrepreneurial attitudes: 1.3.1 Patience 1.3.2 Honesty 1.3.3 Quality-consciousness 1.3.4 Safety-consciousness 1.3.5 Resourcefulness | 1.1 Communication skills 1.2 Complying with quality procedures |
| 2. Communicate entrepreneurial workplace best practices | 2.1 Observed good practices relating to workplace operations are communicated to appropriate person . 2.2 Observed quality procedures and practices are communicated to appropriate person 2.3 Cost-conscious habits in resource utilization are communicated based on industry standards. | 2.1 Workplace best practices, policies and criteria 2.2 Resource utilization 2.3 Ways in fostering entrepreneurial attitudes: 2.3.1 Patience 2.3.2 Honesty 2.3.3 Quality-consciousness 2.3.4 Safety-consciousness 2.3.5 Resourcefulness | 2.1 Communication skills 2.2 Complying with quality procedures 2.3 Following workplace communication protocol |

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|--|--|--|---|
| 3. Implement cost-effective operations | 3.1 Preservation and optimization of workplace resources is implemented in accordance with enterprise policy 3.2 Judicious use of workplace tools, equipment and materials are observed according to manual and work requirements. 3.3 Constructive contributions to office operations are made according to enterprise requirements. 3.4 Ability to work within one's allotted time and finances is sustained. | 3.1 Optimization of workplace resources 3.2 5S procedures and concepts 3.3 Criteria for cost-effectiveness 3.4 Workplace productivity 3.5 Impact of entrepreneurial mindset to workplace productivity 3.6 Ways in fostering entrepreneurial attitudes: 3.3.1 Quality-consciousness 3.3.2 Safety-consciousness | 3.1 Implementing preservation and optimizing workplace resources 3.2 Observing judicious use of workplace tools, equipment and materials 3.3 Making constructive contributions to office operations 3.4 Sustaining ability to work within allotted time and finances |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|--------------------------|---|
| 1. Good practices | May include: 1.1 Economy in use of resources 1.2 Documentation of quality practices |
| 2. Resources utilization | May include: 2.1 Consumption/ use of consumables 2.2 Use/Maintenance of assigned equipment and furniture 2.3 Optimum use of allotted /available time |

EVIDENCE GUIDE

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|-----------------------------------|---|
| 3. Critical aspects of competency | Assessment requires evidence that the candidate: 1.1 Demonstrated ability to identify and sustain cost-effective activities in the workplace 1.2 Demonstrated ability to practice entrepreneurial knowledge, skills and attitudes in the workplace. |
| 5. 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 2.3.1 Enterprise procedures manuals 2.3.2 Company quality policy |
| 6. Methods of Assessment | Competency in this unit should be assessed through: 3.1 Interview 3.2 Third-party report |
| 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 OF COMPETENCY : PREPARE CONSTRUCTION MATERIALS AND TOOLS

UNIT CODE : CON931201

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on identifying, requesting and receiving construction materials and tools in various workplace settings.

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|-------------------------------------|---|---|--|
| 1. Identify materials | 1.1 Materials are identified as per job requirements 1.2 Quantity and description of materials and tools conform with the job requirements 1.3 Tools and accessories are identified according to job requirements | 1.1 Different work specifications 1.2 Types and uses of Carpentry tools and accessories | 1.1 Identifying tools and accessories according to the job requirements |
| 2. Prepare requisition of materials | 2.1 Materials and tools needed are requested according to the identified requirements 2.2 Request is done as per company standard operating procedures (SOP) 2.3 Substitute materials and tools are provided without sacrificing cost and quality of work | 2.1 Work requirements 2.2 Types and uses of Carpentry tools and accessories 2.3 Material take-off 2.4 Requisition procedures | 2.1 Preparing material take-off 2.2 Requesting materials and tools |
| 3. Receive and inspect materials | 3.1 Materials and tools issued are inspected as per quantity and specification Tools, accessories and materials are checked 3.2 Materials and tools are set aside to appropriate location | 3.1 Policy on receiving material deliveries 3.2 Material and tools quality and defects 3.3 Material handling | 3.1 Checking and inspecting materials and tools 3.2 Storing/ stacking of tool and materials |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|--|---|
| 1. Description of materials and tools | May include: 1.1 Brand name 1.2 Size 1.3 Capacity 1.4 Kind of application |
| 2. Tools and accessories | May include: 2.1 Electrical supplies 2.2 Mechanical supplies 2.3 Cleaning supplies |
| 3. Company standard operating procedures | May include: 3.1 Job order 3.2 Requisition slip 3.3 Borrower slip |

EVIDENCE GUIDE

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|-----------------------------------|---|
| 1. Critical aspects of competency | <p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Listed materials and tools according to quantity and job requirements 1.2 Requested materials and tools according to the list prepared and as per company SOP 1.3 Inspected issued materials and tools as per quantity and job specifications 1.4 Provided tools with safety devices |
| 2. Resource implications | <p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace location 2.2 Materials relevant to the unit of competency 2.3 Plans, drawings and specifications relevant to the activities |
| 3. Methods of assessment | <p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Direct observation/Demonstration with oral questioning |
| 4. Context for assessment | <ul style="list-style-type: none"> 4.1 Competency assessment may occur in workplace or any appropriately simulated environment. 4.2 Assessment may be performed on multiple occasions involving a combination of direct, indirect and supplementary forms of evidence. |

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

UNIT CODE : **CON311201**

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

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|---|--|--|---|
| 1. Identify and access specification/ manuals | 1.1 Appropriate manuals are identified and accessed as per job requirements 1.2 Version and date of manual are checked to ensure that correct specification and procedures are identified | 1.1 Types of manuals used in carpentry 1.2 Identification of symbols used in the manuals | 1.1 Identifying manuals and specifications 1.2 Accessing information and data |
| 2. Interpret manuals | 2.1 Relevant sections, chapters of specifications/ manuals are located in relation to the work to be conducted 2.2 Information and procedure in the manual are interpreted in accordance with industry practices | 2.1 Types of manuals used in carpentry 2.2 Types of symbols used in manuals 2.3 System of measurements Unit conversion | 2.1 Interpreting symbols and specifications 2.2 Accessing information and data 2.3 Applying conversion of units of measurements |
| 3. Apply information in manual | 3.1 Manual is interpreted according to job requirements 3.2 Work steps are correctly identified in accordance with manufacturer's specification 3.3 Manual data are applied according to the given task 3.4 All correct sequencing and adjustments are interpreted in | 3.1 Types of manuals used in carpentry 3.2 Types and application of symbols in manuals 3.3 Unit conversion | 3.1 Applying information from manuals |

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|------------------|---|---|-------------------------------------|
| | accordance with information contained on the manual or specifications | | |
| 4. Store manuals | 4.1 Manual or specification is stored appropriately to prevent damage, ready access and updating of information when required in accordance with company requirements | 4.1 Types of manuals used in carpentry 4.2 Manual storing and maintaining procedures | 4.1 Storing and maintaining manuals |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|-----------|--|
| 1. Manual | 1.1 Manufacturer's Specification Manual 1.2 Maintenance Procedure Manual 1.3 Periodic Maintenance Manual |

EVIDENCE GUIDE

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|-----------------------------------|--|
| 1. Critical aspects of competency | Assessment requires evidence 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 MUST be provided: 2.1 All manuals/catalogues relative to construction sector |
| 3. Method of assessment | Competency must be assessed through: 3.1 Direct observation/Demonstration with Oral Questioning |
| 4. Context for assessment | 4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center. |

UNIT OF COMPETENCY : PERFORM MENSURATIONS AND CALCULATIONS

UNIT CODE : CON311203

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on Identifying and measuring objects based on the required performance standards.

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|---|---|--|--|
| 1. Select measuring instruments | 1.1 Object or component to be measured is identified, classified and interpreted according to the appropriate regular geometric shape 1.2 Measuring tools are selected/identified as per object to be measured or job requirements 1.3 Correct specifications are obtained from relevant sources 1.4 Measuring instruments are selected according to job requirements 1.5 Alternative measuring tools are used without sacrificing cost and quality of work | 1.1 Types of measuring tools and its uses | 1.1 Selecting measuring instruments |
| 2 Carry out measurements and calculations | 2.1 Measurements are obtained according to job requirements 2.2 Alternative measuring tools are used without sacrificing cost and quality of work 2.3 Calculations needed to complete work tasks are performed using the four basic process of addition (+), subtraction (-), multiplication (x) and division (/) 2.4 Calculations | 2.1 Linear measurement 2.2 Geometrical measurement 2.3 Unit conversion 2.4 Ratio and proportion 2.5 Area | 2.1 Interpreting formulas for volume, areas, perimeters of plane and geometric figures 2.2 Handling of measuring instrument |

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|----------|--|--|------------------------|
| | involving fractions, percentages and mixed numbers are used to complete workplace tasks 2.5 Numerical computation is self checked and corrected for accuracy 2.6 Instruments are read to the limit of accuracy of the tool 2.7 Systems of measurement identified and converted according to job requirements/ISO 2.8 Workpieces are measured according to job requirements | | |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|----------------------------------|--|
| 1. Geometric shape | May include: 1.1 Round 1.2 Square 1.3 Rectangular 1.4 Triangle 1.5 Sphere 1.6 Conical |
| 2. Measuring instruments | May include: 2.1 Micrometer (In-out, depth) 2.2 Vernier caliper (out, inside) 2.3 Thickness gauge 2.4 Torque gauge 2.5 Small hole gauge 2.6 Try-square 2.7 Protractor 2.8 Steel ruler 2.9 Voltmeter 2.10 Ammeter 2.11 Gauges 2.12 Thermometers |
| 3. Measurements and calculations | May include: 3.1 Linear 3.2 Volume 3.3 Area 3.4 Wattage 3.5 Voltage 3.6 Amperage 3.7 Inside diameter 3.8 Length 3.9 Thickness 3.10 Outside diameter 3.11 Density |

EVIDENCE GUIDE

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|-----------------------------------|---|
| 1. Critical aspects of Competency | <p>Assessment requires that the candidate:</p> <ul style="list-style-type: none"> 1.1 Selected and prepared appropriate measuring instruments in accordance with job requirements 1.2 Performed measurements and calculations according to job requirements/ ISO |
| 2. Resource implications | <p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace location 2.2 Problems to solve 2.3 Measuring instrument appropriate to carry out tasks 2.4 Instructional materials relevant to the propose activity |
| 3. Methods of assessment | <p>Competency must be assessed through:</p> <ul style="list-style-type: none"> 3.1 Direct observation/Demonstration with Oral Questioning |
| 4. Context of assessment | <ul style="list-style-type: none"> 4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center |

UNIT OF COMPETENCY : MAINTAIN TOOLS AND EQUIPMENT

UNIT CODE : CON311204

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on checking condition, performing preventive maintenance, and storing of construction painting tools and equipment.

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|---|--|--|---|
| 1. Check condition of tools and equipment | 1.1 Materials, tools and equipment are identified according to classification and job requirements 1.2 Non-functional tools and equipment are segregated and labeled according to classification 1.3 Safety of tools and equipment are observed in accordance with manufacturer's instructions 1.4 Condition of Personal Protective Equipment (PPE) are checked in accordance with manufacturer's instructions | 1.1 Use of PPE 1.2 Handling of tools and equipment 1.3 Good housekeeping 1.4 Types and uses of lubricants 1.5 Types and uses of cleaning materials | 1.1 Maintaining tools and equipment 1.2 Handling of tools and equipment 1.3 Identifying tools and equipment defects |
| 2. Perform basic preventive maintenance | 2.1 Equipment is checked for operation in accordance manufacturer's. Appropriate lubricants are identified according to types of equipment 2.2 Tools and equipment are lubricated according to preventive maintenance schedule or manufacturer's specifications 2.3 Measuring instruments are checked and calibrated in accordance with manufacturer's instructions 2.4 Tools are cleaned and lubricated according to standard procedures 2.5 Defective instruments, equipment and | 2.1 Use of PPE 2.2 Handling of tools and equipment 2.3 Good housekeeping 2.4 Types and uses of lubricants 2.5 Types and uses of cleaning materials 2.6 Methods and techniques 2.7 Procedures | 2.1 Handling of tools and equipment 2.2 Performing preventive maintenance |

| ELEMENTS | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILLS |
|------------------------------|---|--|---|
| | <p>accessories are inspected and replaced according to manufacturer's specifications</p> <p>2.6 Tools are inspected, repaired and replaced after use</p> <p>2.7 Work place is cleaned and kept in safe state in line with Occupational Safety and Health (OSHS)</p> | | |
| 3. Store tools and equipment | <p>3.1 Inventory of tools, instruments and equipment are conducted and recorded as per company practices</p> <p>3.2 Tools and equipment are stored safely in appropriate locations in accordance with manufacturer's specifications or company procedures</p> | <p>3.1 Use of PPE</p> <p>3.2 Handling of tools and equipment</p> <p>3.3 Storing procedures and techniques</p> <p>3.4 Storage conditions/ locations</p> | <p>3.1 Storing tools and equipment</p> <p>3.2 Handling of tools and equipment</p> |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|--|---|
| 1. Materials | May include: 1.1 Lubricants 1.2 Cleaning materials 1.3 Rust remover 1.4 Rugs 1.5 Spare parts |
| 2 Tools and equipment | May include: 2.1 Tools Cutting tools - hacksaw, crosscut saw Boring tools - brace, hand drill Holding tools - vise grip, C-clamp, bench vise Threading tools - die and stock, taps 2.2 Measuring instruments/equipment |
| 3. Protective Personal Equipment (PPE) | May include but are not limited to: 3.1 Goggles 3.2 Gloves 3.3 Safety shoes 3.4 Hard hat 3.5 Reflectorized Vest |

EVIDENCE GUIDE

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| <p>1. Critical aspect of competency</p> | <p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Selected and used appropriate processes, tools and equipment to carry out task 1.2 Identified functional and non-functional tools and equipment 1.3 Checked, lubricated and calibrated tools, equipment and instruments according to manufacturer's specifications 1.4 Replaced defective tools, equipment and their accessories 1.5 Observed and applied safe handling of tools and equipment and safety work practices 1.6 Prepared and submitted inventory report, where applicable 1.6 Maintained workplace in accordance with OSHA regulations 1.7 Stored tools and equipment safely in appropriate locations and in accordance with company practices |
| <p>2. Resource implications</p> | <p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace 2.2 Maintenance schedule 2.3 Maintenance materials, tools and equipment relevant to the proposed activity/task |
| <p>3. Methods of assessment</p> | <p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Direct observation/Demonstration with Oral Questioning 3.2 Written Examination |
| <p>4. Context for assessment</p> | <p>4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.</p> |

CORE COMPETENCY

UNIT OF COMPETENCY : OPERATE AND MAINTAIN SURROUNDING FACILITIES OF SPIS

UNIT CODE : AFFXXXXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to check and inspect surrounding facilities of SPIS, conduct maintenance and conduct post activities. Observation of industry procedures and safety particularly on the use of oxygen tank are practice.

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms are elaborated in the Range Statement</i> | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILL |
|-----------------------------------|--|---|---|
| 1. Inspect surrounding facilities | 1.1 On-site visit is conducted based industry practice 1.2 Visual inspection is conducted for clogging and siltation 1.3 Condition of filter system is checked following industry procedures 1.4 Waterways are checked following industry procedures 1.5 Water level is inspected according to industry procedures 1.6 Meteorological condition in the area are determined based on local climatic condition 1.7 Shading of the area is monitored following industry procedures 1.8 Fence is checked for damage according to workplace procedures 1.9 Safety practices are applied following OSHS | 1.1 Components and functions of SPIS and surrounding facilities 1.2 Layout of SPIS area 1.3 Causes of clogs and siltation 1.4 Types of water filter system 1.5 Condition of filter system 1.6 Industry procedures of checking filter system 1.7 Types of water source 1.8 Checking of waterways 1.9 Uses and importance of oxygen tank in checking filter condition 1.10 Reading of water level meter 1.11 Types of water pump 1.12 Pump protection device | 1.1 Conducting on-site visit 1.2 Conducting visual inspection 1.3 Checking condition of filter 1.4 Interpreting layout 1.5 Following layout of SPIS area 1.6 Checking waterways 1.7 Inspecting trash rack and filter system 1.8 Inspecting water level 1.9 Monitoring shading of the area 1.10 Checking fence 1.11 Applying OSHS 1.12 Communication Skills 1.13 Operating oxygen tank |

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms are elaborated in the Range Statement</i> | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILL |
|------------------------|--|---|---|
| | | 1.13 Inspection process 1.14 OSHS 1.15 Environmental Rules and Regulations 1.16 Determining water level 1.17 Meteorological condition 1.18 Local climatic condition 1.19 Communication skills 1.20 Effects of shading to the performance of solar panels 1.21 Monitoring procedures for shading 1.22 Trimming plan | |
| 2. Conduct maintenance | 2.1 Cleaning of clogs is performed based on industry procedures 2.2 Surrounding trees are trimmed based on trimming plan 2.3 Tools, materials, supplies and equipment are utilized following manufacturer's manual 2.4 Closing of head gate is performed following industry practice 2.5 Weeds are controlled following industry practices 2.6 Fences are maintained following industry procedures 2.7 Safety practices are applied following OSHS | 2.1 Methods of declogging and cleaning of waterways 2.2 Waste management 2.3 Different tools and equipment 2.4 Utilization of tools and equipment 2.5 OSHS 2.6 Trimming plan and procedures 2.7 Weed control practices | 2.1 Cleaning of clogs 2.2 Trimming of surrounding areas 2.3 Closing of head gates 2.4 Controlling weeds 2.5 Managing waste materials 2.6 Applying OSHS |

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms are elaborated in the Range Statement</i> | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILL |
|----------------------------|---|---|--|
| 3. Conduct post activities | 3.1 Tools and equipment are maintained and stored following industry procedures 3.2 Inventory of supplies and materials are conducted based on workplace procedures 3.3 Documentation is conducted following industry practices 3.4 Recordkeeping is performed following industry practices 3.5 Wastes are managed according to environmental rules and regulations 3.6 Safety practices are applied following OSHS | 3.1 Maintaining and storing procedures 3.2 Inventory procedures 3.3 Documentation procedures 3.4 Recordkeeping procedures 3.5 Waste management 3.6 OSHS 3.7 Coordinating skills 3.8 Communication skills | 3.1 Maintaining and storing of tools and equipment 3.2 Conducting inventory of supplies and materials 3.3 Documenting and preparing of report 3.4 Record keeping 3.5 Managing wastes 3.6 Applying OSHS 3.7 Communication skills 3.8 Coordinating skills |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|--|---|
| 1. Industry procedures in checking condition of filter | May include: 1.1 Inspection of water discharge 1.2 Checking of water sensor 1.3 Following manufacturer's manual 1.4 Following layout of SPIS area |
| 2. Industry procedures in inspecting water level | May include: 2.1 Required water volume 2.2 Types of water pumps 2.2.1 Surface pump 2.2.2 Submersible pump |
| 3. Waterways | May include: 3.1 Water source to the sump 3.2 Water distribution line |
| 4. Tools and equipment | May include 4.1 Tools 4.1.1 Bolo 4.1.2 Saw 4.1.3 Axe (small;12") 4.1.4 Shovel 4.1.5 Wheelbarrow 4.1.6 Ladder (portable) 4.1.7 Flash light 4.2 Equipment 4.2.1 Grass cutter 4.2.2 Communication gadget 4.2.3 Oxygen tank 4.2.4 Camera |
| 5. Supplies and materials | May include: 5.1 Rope 5.2 PPEs (rubber boots, gloves, hard hat, raincoat, goggles, body harness) 5.3 Meter stick 5.4 Steel tape 5.5 Pail 5.6 Logbook 5.7 Pen |
| 6. Maintenance of fence | Includes: 6.1 Replacement 6.2 Repair 6.3 Repaint |
| 7. Documentation | May include: 7.1 Taking photos 7.2 Written reports 7.3 Taking videos |

EVIDENCE GUIDE

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|--|---|
| <p>1. Critical aspects of competency</p> | <p>Assessment requires evidence that the candidate:</p> <p>1.1 Inspect surrounding facilities</p> <p>1.1.1 Conducted visual inspection for clogging and siltation</p> <p>1.1.2 Checked condition of filter system</p> <p>1.1.3 Inspected water level</p> <p>1.1.4 Determined meteorological condition in the area based on local climatic condition</p> <p>1.1.5 Monitored shading of the area</p> <p>1.1.6 Used oxygen tank</p> <p>1.1.7 Applied safety practices following OSHS</p> <p>1.2 Conduct maintenance</p> <p>1.2.1 Cleaned clogs</p> <p>1.2.2 Trimmed surrounding trees</p> <p>1.2.3 Utilized tools and equipment</p> <p>1.2.4 Closed head gate</p> <p>1.2.5 Controlled weeds</p> <p>1.2.6 Maintained fences</p> <p>1.2.7 Applied safety practices following OSHS</p> <p>1.3 Conduct post activities</p> <p>1.3.1 Maintained tools and equipment</p> <p>1.3.2 Conducted inventory of supplies and materials</p> <p>1.3.3 Conducted documentation</p> <p>1.3.4 Performed record keeping</p> <p>1.3.5 Managed waste</p> <p>1.3.6 Applied safety practices following OSHS</p> |
| <p>2. Resource Implications</p> | <p>The following resources should be provided:</p> <p>2.1 Actual or simulated workplace</p> <p>2.2 Tools materials and equipment needed to perform the required tasks</p> <p>2.3 References and manuals</p> <p>2.4 PPEs</p> <p>2.5 First Aid Kit</p> |
| <p>3. Method of assessment</p> | <p>Competency in this unit may be assessed through:</p> <p>3.1 Written examination</p> <p>3.2 Demonstration</p> <p>3.3 Oral questioning</p> <p>3.4 Direct observation</p> |
| <p>4. Context of assessment</p> | <p>4.1 Competency may be assessed in the work place or in a simulated work place setting</p> <p>4.2 Assessment shall be done while tasks are undertaken individually under limited supervision</p> |

UNIT OF COMPETENCY : OPERATE AND MAINTAIN SOLAR POWERED IRRIGATION SYSTEM (SPIS) COMPONENTS AND ACCESSORIES

UNIT CODE : AFFXXXXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to operate and check SPIS components and accessories, conduct preventive maintenance, repair and maintain pipes and conduct post activities. Following of manufacturer’s manual are practice. Observation of safety particularly on the use of oxygen tank are practice.

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms are elaborated in the Range Statement</i> | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILL |
|--|---|--|---|
| 1. Check SPIS components and accessories | 1.1 Components are identified based on industry procedures 1.2 Plan and design of SPIS is secured and read following industry procedure 1.3 Operational procedure of SPIS is secured and read following manufacturer’s manual 1.4 Controller are inspected for functionality and intrusions according to manufacturer’s manual 1.5 Solar panels, wires and cables are checked for integrity and cleanliness following manufacturer’s manual 1.6 Performance of pump is tested according to manufacturer’s manual 1.7 Pipes and fittings are checked for leaks and damage according to industry procedures 1.8 Electrical conduits are inspected for damage according to industry procedures 1.9 Tester is used to check functionality of | 1.1 Basic principle of electrical system 1.2 Basic principle of solar energy and technology 1.3 Major components and accessories of SPIS 1.4 Plan and design of SPIS 1.4.1 Schematic diagram and operational procedure 1.4.2 Layout of SPIS 1.5 Functions and types of controller 1.6 Use and importance of oxygen tank in checking pump 1.7 Types of damage of solar panel 1.8 Inspection and checking procedures 1.9 Types of intrusion to controller 1.10 Causes of intrusion to controller 1.11 Environmental condition 1.12 Performance of | 1.1 Checking controller 1.2 Inspecting control boxes 1.3 Checking solar panel 1.4 Monitoring of environmental condition 1.5 Using tester 1.6 Using and following manufacturer’s manual 1.7 Practicing safety 1.8 Operating oxygen tank |

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms are elaborated in the Range Statement</i> | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILL |
|----------------------------------|---|--|--|
| | electrical components according to manufacturer's manual 1.10 Surge Protection Device (SPD) is checked following industry procedure 1.11 Safety practices are applied following OSHS | pump 1.13 Uses and functions of tester 1.14 Relevance of following Manufacturer's Manual 1.15 Functions of Surge Protection Device 1.16 OSHS | |
| 2. Operate SPIS | 2.1 Manufacturer's manual is read and followed 2.2 Start – up of SPIS are performed following manufacturer's manual 2.3 System operation is monitored following manufacturer's manual 2.4 Shutting down of SPIS is performed following manufacturer's manual 2.5 Safety practices are applied following OSHS | 2.1 Manufacturer's manual 2.2 SPIS Components and accessories 2.3 Start-up and Shutting down procedures 2.4 System operation 2.5 Monitoring procedures 2.6 Communication Skills 2.7 OSHS | 2.1 Reading and following manufacturer's manual 2.2 Starting – up SPIS 2.3 Monitoring system operation 2.4 Shutting down SPIS 2.5 Following manufacturer's manual 2.6 Applying safety practices |
| 3 Conduct preventive maintenance | 3.1 Solar panels are <i>maintained</i> following industry standards 3.2 Controller is <i>maintained</i> following industry standards 3.3 Pump is <i>maintained</i> following industry standards 3.4 Mounting structure is <i>maintained</i> following industry practice 3.5 Reservoir and <i>conveyance structure</i> is <i>checked</i> and cleaned following industry procedure 3.6 Discharge is <i>monitored</i> following industry procedure. 3.7 Documentation and record keeping is | 3.1 Preventive maintenance procedures 3.2 Preventive maintenance schedule 3.3 Functionality of solar panels, controller and water pump 3.4 Protocol of SPIS method of testing 3.5 AMTEC Testing 3.6 Use and importance of oxygen tank in maintaining pump 3.7 Communication skills 3.8 Documentation and record keeping | 3.1 Maintaining od solar panel 3.2 Maintaining of controller 3.3 Maintaining water pump 3.4 Communication skills 3.5 Reading of water meter 3.6 Conducting documentation and record keeping 3.7 Conducting report 3.8 Disseminating information to nearby community 3.9 Using and following manufacturer's |

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms are elaborated in the Range Statement</i> | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILL |
|-----------------------------------|--|---|--|
| | <p>conducted according to industry procedure</p> <p>3.8 Pipes and fittings are tightened following industry procedure</p> <p>3.9 Shutting down SPIS is performed based on manufacturer's manual</p> <p>3.10 Safety practices are applied following OSHS</p> | <p>procedures</p> <p>3.9 Accomplishment of checklist</p> <p>3.10 Functions of water meter</p> <p>3.11 Functions of sensor</p> <p>3.12 Reading of water meter</p> <p>3.13 Types of reservoir</p> <p>3.14 Cleaning procedures of reservoir</p> <p>3.15 Manufacturer's Manual</p> <p>3.16 Tightening of pipes and fittings</p> <p>3.17 Computation of discharge</p> <p>3.18 Information dissemination on danger and safety of SPIS facilities</p> <p>3.19 OSHS</p> | <p>manual</p> <p>3.10 Shutting down SPIS</p> <p>3.11 Cleaning of reservoir</p> <p>3.12 Operating oxygen tank</p> <p>3.13 OSHS</p> |
| <p>4 Repair and maintain SPIS</p> | <p>4.1 Tools, materials and supplies are used in basic troubleshooting</p> <p>4.2 Replacement of damaged pipes is coordinated following industry procedure</p> <p>4.3 Remedial action is applied on minor damage of pipes based on instruction of authority.</p> <p>4.4 <i>Major breakdown and irregularities</i> are reported and coordinated to immediate superior</p> <p>4.5 Wastes are managed according to environmental rules and regulations</p> <p>4.6 Shutting down SPIS</p> | <p>4.1 Remedial action on minor damage of pipes</p> <p>4.2 Functions of SPIS components</p> <p>4.3 SPIS layout</p> <p>4.4 Damages of pipes</p> <p>4.5 Basic trouble shooting</p> <p>4.6 Irregularities and major breakdown of SPIS components and accessories</p> <p>4.7 Functionality of controller</p> <p>4.8 Shutting down SPIS</p> <p>4.9 Communication skills</p> | <p>4.1 Determining and using of tools, materials and supplies</p> <p>4.2 Managing wastes</p> <p>4.3 Applying OSHS</p> <p>4.4 Communication skills</p> <p>4.5 Coordinating skills</p> <p>4.6 Reporting and coordinating major breakdown and irregularities</p> <p>4.7 Shutting down SPIS</p> <p>4.8 Performing remedial action on minor damage of pipes</p> |

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms are elaborated in the Range Statement</i> | REQUIRED KNOWLEDGE AND ATTITUDE | REQUIRED SKILL |
|----------------------------|---|---|--|
| | <p>is performed based on manufacturer's manual</p> <p>4.7 Safety practices are applied following</p> | <p>4.10 Coordinating skills</p> <p>4.11 Waste management</p> <p>4.12 OSHS</p> | |
| 5. Conduct post activities | <p>5.1 Tools and equipment are maintained and stored following industry procedures</p> <p>5.2 Inventory of supplies and materials are conducted based on workplace procedures</p> <p>5.3 Documentation is conducted following industry practices</p> <p>5.4 Record keeping is performed following industry practices</p> <p>5.5 Wastes are managed according to environmental rules and regulations</p> <p>5.6 Safety practices are applied following OSHS</p> | <p>5.1 Maintaining and storing procedures</p> <p>5.2 Inventory procedures</p> <p>5.3 Documentation and reporting procedures</p> <p>5.4 Record keeping procedures</p> <p>5.5 Waste management</p> <p>5.6 OSHS</p> <p>5.7 Coordinating skills</p> <p>5.8 Communication skills</p> | <p>5.1 Maintaining and storing of tools and equipment</p> <p>5.2 Conducting inventory of supplies and materials</p> <p>5.3 Documenting and preparing of report</p> <p>5.4 Record keeping</p> <p>5.5 Managing wastes</p> <p>5.6 Applying OSHS</p> <p>5.7 Communication skills</p> <p>5.8 Coordinating skills</p> <p>5.9 Reporting</p> |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|--------------------------------------|--|
| 1. Plan and design | May include: 1.1 Schematic diagram 1.2 Layout of SPIS |
| 2. Intrusions | May include: 2.1 Insects (ants, roaches, bees, wasp) 2.2 Lizards 2.3 Mice 2.4 Spiders |
| 3. Testing performance of pump | May include: 3.1 Functionality of wiring system 3.2 Discharge of water 3.3 Water meter reading |
| 4. Maintenance of solar panels | May include: 4.1 Tightening of loose screws of terminals 4.2 Tightening of bolts, nuts, and clamps of solar panels 4.3 Washing and wiping of solar panels 4.4 Removing of corrosions and repainting solar panel mounting structure |
| 5. Maintenance of controller | May include: 5.1 Shutting down SPIS 5.2 Brushing out of cobwebs and insects 5.3 Applying of repellent 5.4 Sealing of entry points as permitted by the supplier 5.5 Removing of lizards and mice |
| 6. Maintenance of pump | May include: 6.1 Coordinating performance check before expiration of warranty 6.2 Cleaning of screen or filter 6.3 Tightening of bolts 6.4 Monitoring and coordinating for annual electrical check 6.5 Monitoring and coordinating for once every three years mechanical check 6.6 Monitoring and coordinating performance check before expiration of warranty |
| 7. Maintenance of mounting structure | May include: 7.1 Removing corrosion 7.2 Cleaning 7.3 Replacing |
| 8. Conveyance structure | May include: 8.1 Open channels (canals) 8.2 Close channels (pipes) |
| 9. Checking of reservoir | May include: 9.1 Checking for leakage 9.2 Checking for crack 9.3 Checking for algae 9.4 Checking for silt |

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| 10. Tools and supplies | May include: 10.1 Saw 10.2 Multimeter 10.3 Screw driver (Philips and flat) 10.4 Allen Screw driver 10.5 Combination pliers 10.6 Long nose pliers 10.7 Electrical tape 10.8 Side cutting plier 10.9 Sealant gun 10.10 Communication gadget |
| 11. Monitoring of discharge rate | May include: 11.1 Reading of water meter 11.2 Basin method |
| 12. Major breakdown and irregularities | May include: Electrical 12.1 Exposed and open live wires 12.2 Burnt controllers 12.3 Short circuit 12.4 Broken solar panels Mechanical 12.1 Damaged pump 12.2 Clogged impeller |
| 13. Documentation | May include: 13.1 Taking photos 13.2 Written reports 13.3 Taking videos 13.4 Job done |

EVIDENCE GUIDE

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| <p>1. Critical aspects of competency</p> | <p>Assessment requires evidence that the candidate:</p> <p>1.1 Check SPIS components and accessories</p> <ul style="list-style-type: none"> 1.1.1 Secured plan and design of SPIS 1.1.2 Inspected controller for intrusions 1.1.3 Inspected functionality of pump 1.1.4 Checked pipes and fittings for leaks and damage 1.1.5 Read layout 1.1.6 Used tester to check functionality of electrical components 1.1.7 Applied safety practices following OSHS <p>1.2 Operate SPIS</p> <ul style="list-style-type: none"> 1.2.1 Read and followed manufacturer’s manual 1.2.2 Started up SPIS 1.2.4 Monitored system operation 1.2.5 Shut down SPIS 1.2.6 Applied safety practices following OSHS <p>1.3 Conduct preventive maintenance</p> <ul style="list-style-type: none"> 1.3.1 Identified SPIS components 1.3.2 Maintained controller 1.3.3 Maintained pump 1.3.4 Maintained mounting structure 1.3.5 Conducted documentation and record keeping 1.3.6 Checked and cleaned reservoir and conveyance structure 1.3.7 Shutdown SPIS 1.3.7 Applied safety practices following OSHS <p>1.4 Repair and maintain SPIS</p> <ul style="list-style-type: none"> 1.4.1 Used tools, materials and supplies in basic troubleshooting 1.4.2 Coordinated replacement of pipes 1.4.3 Coordinated major breakdown and irregularities 1.4.5 Managed wastes 1.4.5 Shutdown SPIS 1.4.6 Applied safety practices following OSHS <p>1.5 Conduct post activities</p> <ul style="list-style-type: none"> 1.5.1 Maintained tools and equipment 1.5.2 Conducted inventory of supplies and materials 1.5.3 Conducted documentation 1.5.4 Performed record keeping 1.5.5 Managed wastes 1.5.6 Applied safety practices following OSHS |
| <p>2. Resource Implications</p> | <p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Actual or simulated workplace 2.2 Tools materials and equipment needed to perform the required tasks 2.3 References and manuals 2.4 PPEs 2.5 First Aid Kit |
| <p>3. Method of assessment</p> | <p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Written examination 3.2 Demonstration |

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| | 3.3 Oral questioning 3.4 Direct observation |
| 4. Context of assessment | 4.1 Competency may be assessed in the work place or in a simulated work place setting 4.2 Assessment shall be done while tasks are undertaken individually under limited supervision |

UNIT OF COMPETENCY : IMPLEMENT WATER DISTRIBUTION

UNIT CODE : AFFXXXXXX

UNIT DESCRIPTOR : This unit describes the knowledge, skills and attitude required to conduct preparation activities, perform water distribution and conduct shutting down activities. Following of policy systems and procedures of the community are practice.

| ELEMENT | PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables | REQUIRED KNOWLEDGE | REQUIRED SKILLS |
|-----------------------------------|--|---|---|
| 1. Conduct preparation activities | 1.1 Farm plan and planting calendar is secured following industry procedures 1.2 Area of farm is identified based on farm plan 1.3 Volume of water per farm area is determined based on farm plan 1.4 Irrigation scheduling is followed based on farm plan 1.5 End users are informed on water distribution scheme 1.6 Relevant information on local settings are gathered according to industry procedure | 1.1 Farm plan 1.2 Planting calendar 1.3 Policy systems and procedures (PSP) 1.4 Schedule of irrigation 1.5 Social skills 1.6 Communication skills 1.7 Relevant information on local settings 1.8 Coordination with LGUs and other organization 1.9 Basic computer skills 1.10 Basic computation skills 1.11 Attitude: 1.11.1 Culture sensitive | 1.1 Securing farm plan 1.2 Identifying farm area 1.3 Determining volume of water 1.4 Scheduling of water distribution 1.5 Informing end users of water distribution scheme 1.6 Communication skills 1.7 Social skills 1.8 Basic computer skills 1.9 Basic computation skills 1.10 Gathering relevant information on local settings |
| 2 Perform water distribution | 2.1 Water discharge is checked for irrigation based on industry procedure 2.2 Gate valves and pipes are checked for irrigation 2.3 Irrigation is done based on industry procedures 2.4 Water distribution is monitored following | 2.1 Water distribution plan 2.2 Types of water conveyance structure 2.3 Irrigation scheduling 2.4 Water discharge 2.5 Checking procedures 2.6 Irrigation procedures | 2.1 Checking of water volume 2.2 Checking gate valves and pipes 2.3 Opening gate valves 2.4 Conducting irrigation 2.5 Performing adjustment 2.6 Applying OSHS |

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| | <p>industry procedures</p> <p>2.5 Adjustment is performed based on the result of monitoring</p> <p>2.6 Safety practices are applied following OSHS</p> | <p>2.7 Monitoring procedures</p> <p>2.8 Crop water requirement</p> <p>2.9 Procedure in releasing water</p> <p>2.10 OSHS</p> <p>2.11 Communication skills</p> | |
| 3 Conduct shutting down activities | <p>3.1 Irrigation period is monitored following irrigation scheduling</p> <p>3.2 Water released in the farm is verified following industry practices</p> <p>3.3 Irregularities are reported following industry procedures</p> <p>3.4 Recommendation is prepared based on findings and irregularities of the situation</p> <p>3.5 Appropriate action is implemented based on findings and recommendations</p> <p>3.6 Safety practices are applied following OSHS</p> | <p>3.1 Monitoring of irrigation period</p> <p>3.2 Verification procedure</p> <p>3.3 Irregularities of water supplies</p> <p>3.4 Reporting procedures</p> <p>3.5 Waste Management</p> <p>3.6 OSHS</p> | <p>3.1 Monitoring of irrigation period</p> <p>3.2 Verifying water released</p> <p>3.3 Reporting irregularities</p> <p>3.4 Preparing recommendations</p> <p>3.5 Implementing appropriate action</p> <p>3.6 Checking water canals and pipes for leakage</p> <p>3.7 Applying OSHS</p> |

RANGE OF VARIABLES

| VARIABLE | RANGE |
|---|---|
| 1. Farm plan | May include: 1.1 Schedule of water distribution 1.2 Volume of water for farm area 1.3 Coverage area for distribution 1.4 Farm mapping |
| 2. Checking of water discharge | May include: 2.1 Basin method 2.2 Visual inspection |
| 3. Industry procedures in releasing water | May include: 3.11 Irrigation schedule 3.12 Water requirement 3.13 Turning of gate valve 3.14 Lifting of canal gate 3.15 Following markings for the opening of canal gate |
| 4 Adjustment | May include: 4.11 Water release 4.12 Irrigation time |
| 5 Verification of water release | May include: 5.11 Phone calls 5.12 Field visit |

EVIDENCE GUIDE

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|--|---|
| <p>1. Critical aspects of competency</p> | <p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Conduct preparation activities <ul style="list-style-type: none"> 1.1.1 Secured farm plan and planting calendar following industry procedures 1.1.2 Identified area of farm based on farm plan 1.1.3 Determined volume of water per farm area based on farm plan 1.1.4 Followed irrigation scheduling based on farm plan 1.1.5 Gathered relevant information on local settings according to industry procedure 1.2 Perform water distribution <ul style="list-style-type: none"> 1.2.1 Checked water discharge for irrigation based on industry procedure 1.2.2 Checked gate valves and pipes 1.2.3 Conducted irrigation based on industry procedures 1.2.4 Monitored water distribution following industry procedures 1.2.5 Performed adjustment based on result of monitoring 1.2.6 Applied safety practices following OSHS 1.3 Conduct shutting down activities <ul style="list-style-type: none"> 1.3.1 Monitored irrigation period following irrigation scheduling 1.3.2 Verified water released in the farm 1.3.3 Reported irregularities following industry procedures 1.3.4 Prepared recommendation based on findings and irregularities of the situation 1.3.5 Implemented appropriate action based on recommendations 1.3.6 Applied safety practices following OSHS |
| <p>2. Resource Implications</p> | <p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Actual or simulated workplace 2.2 Tools materials and equipment needed to perform the required tasks 2.3 References and manuals 2.4 PPEs 2.5 First Aid Kit |
| <p>3. Method of assessment</p> | <p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Written examination 3.2 Demonstration 3.3 Oral questioning 3.4 Direct observation |
| <p>4. Context of assessment</p> | <ul style="list-style-type: none"> 4.1 Competency may be assessed in the work place or in a simulated work place setting 4.2 Assessment shall be done while tasks are undertaken individually under limited supervision |

SECTION 3: TRAINING ARRANGEMENTS

TRAINEE ENTRY REQUIREMENTS

Trainees or students wishing to gain entry into this course should possess the following requirements:

- Must have communication skills
- Must have arithmetic skills

TRAINER'S QUALIFICATIONS FOR AGRICULTURE, FISHERY AND FORESTRY (AFF) SECTOR

The trainer shall have the following qualifications:

- Must be a holder of any Trainer's Training Certificate and;
- Must have at least two (2) years industry experience within the last five (5) years on any areas of Utilization of Solar Energy and Photovoltaic (PV) Systems;

LIST OF TOOLS, EQUIPMENT AND MATERIALS

Recommended list of tools, equipment and materials for the training of 25 trainees for SOLAR POWERED IRRIGATION SYSTEM OPERATION AND MAINTENANCE LEVEL II.

| Tools | | |
|-------|------|--|
| Qty. | Unit | Description |
| 6 | pc | Bolo |
| 6 | pc | Cross-cut saw (18") |
| 6 | pc | Axe (small;12") |
| 6 | pc | Round shovel |
| 6 | pc | Scythe with pole handle |
| 6 | pc | Steel digging bar (25mmx1.8m) |
| 6 | pc | Meter stick (metal) |
| 6 | pc | Steel tape (5m) |
| 2 | pc | Crimping tools for PV connectors |
| 6 | pc | Glass wiper |
| 6 | sets | Box and open wrench (8mm,9mm,10mm,11mm,12mm,13mm,14 mm,15mm,17mm,24mm) |
| 6 | sets | Philips screw driver (11") |
| 6 | sets | Flat screw driver (11") |
| 6 | pc | Steel brush |
| 6 | sets | Sealant gun |
| 6 | sets | Allen wrench |
| 6 | sets | Combination pliers with insulated handle |
| 6 | sets | Long nose pliers |

| Equipment | | |
|------------------|-------------|---|
| Qty. | Unit | Description |
| 3 | units | Grass cutter (2 stroke, 1hp) |
| 3 | units | Communication gadget |
| 1 | unit | Portable water pump with gasoline engine (4.5-6.5 HP) to withdraw water |
| 3 | units | Wheelbarrow |
| 3 | units | Ladder (portable, 16ft.) |
| 6 | pc | Flash light |
| 1 | unit | Camera |
| 6 | units | Multi-tester (digital) |
| 6 | units | Stop watch |
| 6 | units | Calculator |
| 1 | unit | Pulley (6") |
| 2 | units | Oxygen tank (small; specs c/o OSHC) with breathing apparatus used to sump with a dimension of 0.6 x 1.1 m |

| Materials and Supplies | | |
|-------------------------------|-------------|---|
| Qty. | Unit | Description |
| 3 | pc | Rope (10mmx20m) |
| 25 | sets | PPEs |
| | | <ul style="list-style-type: none"> • Rubber boots • Gloves • Hard hat • Raincoat • Goggles body • Harness |
| 6 | pc | Pail |
| 6 | pc | Logbook |
| 6 | pc | Pen |
| 250 | ml | Engine oil |
| 5 | li | Gasoline |
| 1 | kg | Rags |
| 5 | pc | Empty sacks for waste materials (50kg capacity) |
| 6 | pc | Dishwashing liquid soap (250ml) |
| 200 | li | Dechlorinated water for washing solar panel |
| 6 | pc | Paint brush (2") |
| 1 | li | Paint |
| 1 | li | Primer |
| 3 | packs | Naphthalene balls |
| 3 | tubes | Silicon (500ml) |
| 6 | pc | Steel wool |
| 1 | role | Electrical tape (small) |
| 2 | sets | First –aid kit |

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• THE TECHNICAL AND INDUSTRY EXPERT PANEL

RICARDO A. BAUTISTA JR.
PUMP IRRIGATORS ASSOCIATION, INC.
(PIA)
Caridad Norte, Ilanera
Nueva Ecija

PAULINO C. MIMIS
CARIDAD NORTE AND SUR IRRIGATION
ASSOCIATION
Caridad Norte, Ilanera, Nueva Ecija

RICHARD Q. CAYABYAB
ONE RENEWABLE ENERGY ENTERPRISE
Ortigas, Pasig City

DARWIN M. NEVARES
BUREAU OF SOIL AND WATER
MANAGEMENT (BSWM), Quezon City

MARLON N. GALAD
CLSU
Science City of Moñuz, Nueva Ecija

ALVIN N. URGEL
PHYSICS RESEARCH, RENEWABLE
ENERGY – SALES AND SERVICES CORP.,
Talisay City, Cebu

ERLINA G. JOSECO
Agricultural Machinery Manufacturer's and
Distributors Association (AMMDA), Inc.
Quezon City

REUBEN EMMANUEL T. QUEJAS
ONE RENEWABLE ENERGY ENTERPRISE
Ortigas, Pasig City

RAYMUND JOSEPH P. MACARANAS
Philippine Center for Post Harvest
Development and Mechanization (PHilMech)
Nueva Ecija

- **THE PARTICIPANTS IN THE ZONAL VALIDATION**

VISAYAS VALIDATORS

MR. ANTONIO QELIZ
SWISA
Jagnaya, Jamindan, Capiz

MR. MARK NESTOR SILAO
SWISA
Jagnaya, Jamindan, Capiz

MR. GEOMAR VILLANUEVA
One Renewable Energy Enterprise, Inc.
James Espinosa
Houston Hydrotech

MR. RODIL PARCON
Dapitan Farmer Association

MR. ALBERT G. ESTOYA
LGU, Sibalom, Antique

MR. MOISES D. MANA-AY
DA- RFO, Iloilo City

LUZON VALIDATORS

MR. MELCHOR A. BALLESTERO
Lumban, Laguna

MR. JOHN PAUL B. GACOSTA
ALTE Alternative Energy Solutions

MR. JOED G. MONTALBAN
Heal the World Energy Savings Corp.

MR. NICKERSON S. OUANO
ALTE Alternative Energy Solutions

MR. ARNOLD T. NOBLE
B.A.F.C.
Lumban, Laguna

MINDANAO VALIDATORS

MR. ALFREDO L. CAGAPE, JR.
BF UNIFA INC.
Butuan City

MR. GLENN D. ODTOJAN
DA – CARAGA
Butuan City

MR. JAY D. ESPAÑA
DA – Region XIII
Butuan City

MS. MARY JENE F. MACARAYO
DA – CARAGA
Butuan City

MR. ROLDAN V. ESPIRIN
GC Construction
Talacogon, Butuan

MS. THESSA LYN A. BONGCAWEL
DA – CARAGA
Butuan City

MR. GERALD A. SANTELICES
Houston Hydrotech Products and
Systems, Inc.
Region XIII

MS. MYRNA M. PABLETO
Brgy. Amdaro Integrated Farmers
Association, Inc.
Butuan City

PROJECT MANAGEMENT TEAM (COORDINATOR)

- **Department of Agriculture – Agricultural Training Institute (DA – ATI)**

The MANAGEMENT and STAFF of the TESDA Secretariat

- **Qualifications and Standards Office (QSO)**

TESDA – QSO Technical Facilitators

Competency Standards Development Division

MS. BERNADETTE N. SERVAZ- AUDIJE

MS. CHERRY L. TORALDE

MS. MELCHRIS A. ATIS