INDUSTRIAL AUTOMATION

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COMPETENCY STANDARDS
National Vocational Certificate Level 2-4

Version 1 - July, 2019

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COMPETENCY STANDARDS
National Vocational Certificate Level 1

Version 1 - July, 2019

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INTRODUCTION

Industrial Automation is a rapidly developing industrial service sector in Pakistan. It supports the industry to be converted to Automatic control from the conventional control. Presently many companies, vendors and services providers are available in order to serve the purpose. The new industry is having fully Automatic Controls and old industrial controls are rapidly being converted into Automation. Therefore, there is an increasing demand of the Industrial automation technicians. Consequently, the skills are required to be inducted in the future generation. If an individual is planning to pursue a career in industrial automation, this program will be helpful in targeting various areas:

- Understand the basics of Electrical & Electronics which is the prerequisite for Industrial Automation & Control.
- Understand, Operate, maintain and trouble shoot modern industrial Instrumentation.
- Understand, Operate, maintain and trouble shoot modern industrial control systems like PLCs, HMIs, Inverters and Robotics.
- Understand, Operate, maintain and trouble shoot modern Hydraulic & Pneumatic Controls.
- Maintain assembly lines and production lines having Robotics and modern Instrumentation & controls
- As a Service providers to industry in the field of Controls & automation.
- Understand and implement the Safety practices to Industry.

Keeping in view of the above the competency based national vocational qualifications have been developed by NAVTTC to train the unskilled human resource on the technical and entrepreneurial skills to be employed / self-employed and inevitably set sustainable impact on their lives by increase in their livelihood income.

Training Course is based on competency standards which are defined by the industry and the traditional role of a trainer changes and shifts towards the facilitation of training. A trainer encourages and assists trainees to learn for themselves.

Trainees are likely to work in groups (pairs) and all doing something different. Some are doing practical tasks in the workshop, some writing, some not even in the classroom or workshop but in another part of the building using specialist equipment, working on computers doing research on the Internet or the library. As trainees learn at different pace they might well be at different stages in their learning, thus learning must be tailored to suit individual needs. The following facilitation methods (teaching strategies) are generally employed:

Direct Instruction Method:

This might be effective when introducing a new topic to a larger group of trainees in a relative short amount of time. In most cases this method relies on one-way communication, hence there are limited opportunities to get feedback on the trainee's understanding.

Discussion Method:

This allows trainees to actively participate in sharing knowledge and ideas. It will help the trainer to determine whether trainees understand the content of the topic. On the other hand, there is a possibility of straying off topic under discussion and some trainees dominating others on their views.

Small Group Method:

Pairing trainees to help and learn from each other often results in faster knowledge/skill transfer than with the whole class. The physical arrangement of the classroom/workshop and individual assessment may be challenging. Analogy method should be in corporate.

Problem Solving Method:

This is a very popular teaching strategy for the training. Trainees are challenged and are usually highly motivated when they gain new knowledge and skills by solving problems (Contingency skills). Trainees develop critical thinking skills and the ability to adapt to new learning situations (Transfer skills). It might be time consuming and because trainees sometimes work individually, they may not learn all the things that they are expected to learn.

Research Method:

This is used for workshops and laboratory tasks, field experiments, and case studies. It encourages trainees to investigate and find answers for themselves and to critically evaluate information. It however requires a lot of time and careful planning of research projects for the trainee.

PURPOSE OF THE QUALIFICATION

The purpose of the training is to provide skilled manpower to improve the existing industrial automation sector & support. This will improve the quality in different industrial sectors by industrial automation technicians and the availability of skilled professionals will bring socio-economic benefits to all stakeholders. The specific objectives of developing these qualifications are as under:

- Improve the professional competence of industrial automation technicians
- Capacitate the local community and trainers in modern CBT trainings, methodologies and processes as envisaged under NVQF
- Provide flexible pathways and progressions in the Automation sector.
- Enable the trainees to perform their duties in efficient manner
- Establish a standardized and sustainable system of training industrial automation technicians in Pakistan

DATE OF VALIDATION

This national vocational qualification (NVQ) has been validated by the Qualifications Development Committee (QDC) on 24 of May 2019 and will remain in currency until 24 of May 2022

CODE OF QUALIFICATION

Qualification Title	Code
National Vocational Certificate Level-2 in Industrial Automation "Assistant Automation Technician"	**0714 E&A 11**
National Vocational Certificate Level-3 in Industrial Automation "Automation Technician"	**0714 E&A 12**
National Vocational Certificate Level-4 in Industrial Automation "Senior Automation Technician"	**0714 E&A 13**

ENTRY REQUIREMENTS

The entry requirement for

- National Vocational Certificate Level-2 in Industrial Automation (Assistant Automation Technician) is Matric (Science).

- National Vocational Certificate Level-3 in Industrial Automation (Automation Technician) is the award of a National Vocational Certificate Level -2 in Industrial Automation.

- National Vocational Certificate Level-4 in Industrial Automation (Senior Automation Technician) the award of a National Vocational Certificate Level-3 in Industrial Automation.

QUALIFICATIONS DEVELOPMENT COMMITTEE

The following members participated in the qualifications development and validation:

S. No	Name & Designation	Organization
1.	Mr. Sohail Gul Assistant Professor	KP-TEVTA
2.	Ms. Saiqa Ijaz Instructor (PS-17)	Luban Workshop, GTTI, P-TEVTA
3.	Ms. Sumaira Batool Sr. Lab Assistant	PVTC
4.	Engr. Habib ur Rehman Chief Instructor (PS-17)	P-TEVTA
5.	Engr. Furqan Wahid Instructor (PS-17)	GSPCT
6.	Mr. Usman Rashid Baig Director	Mechatronics Engineering Solutions
7.	Mr. Khurram Hameed Integration Manager	The Creative Group
8.	Mr. Husnain Zakir Automation Engineer	Mechatronics Engineering Solutions
9.	Mr. Faisal Farooq Director (Technical)	Mechatronics Engineering Solutions
10.	Mr. Imtiaz Ahmad Buttar Quality Assurance Manager	Don Valley Pharmaceuticals
11.	Engr. Shahbaz Hussain Principal (PS-19)	TEVTA-Punjab ; GCT Gujranwala
12.	Engr. Haroon Aftab Project Engineer	Sky Power
13.	Mr. Ayoub Elahi Co-Facilitator	The University of Lahore
14.	Ms. Saima Asghar DACUM Expert / Facilitator	Freelance Consultant
15.	Mr. Saad Saeed Provincial Coordinator - Punjab	GFA

QUALIFICATIONS VALIDATION COMMITTEE

The Qualifications Validation Committee consisted of following members:

S. No	Name & Designation	Organization
1.	Engr. Shahbaz Hussain Principal (PS-19)	TEVTA-Punjab ; GCT Gujranwala
2.	Mr. Usman Rashid Baig Director	Mechatronics Engineering Solutions
3.	Mr. Khurram Hameed Integration Manager	The Creative Group
4.	Mr. Sohail Gul Assistant Professor (PS-18)	KP-TEVTA
5.	Engr. Furqan Wahid Instructor (PS-17)	GSPCT
6.	Mr. Faisal Farooq Director (Technical)	Mechatronics Engineering Solutions
7.	Ms. Saiqa Ijaz Instructor (PS-17)	Luban Workshop, GTTI, P-TEVTA
8.	Mr. Muhammad Majid Executive Maintenance	Infinity Engineering
9.	Mr.Nadeem Riaz	P.D Exceleron Engineer
10.	Mr.Umer Ayyub Maintenance Engineer	Infinity Engineering
11.	Mr.Saqib Irfan Director	Service Syan Group
12.	Ms. Sumaira Batool Sr. Lab Assistant	PVTC
13.	Ms.Anam Nadeem Khan Free Lancer	Free Lancer
14.	Mr.Shahan Qadri Project Engineer	ABB Power & Automation (Pvt) Ltd.
15.	Mr.Haroon Rasheed Electrical Engineer	HSA Leather
16.	Mr.Liaquat Ali Jamro	Sindh -TEVTA
17.	Ms. Saima Asghar DACUM Expert / Facilitator	Freelance Consultant
18.	Mr. Saad Saeed Provincial Coordinator - Punjab	GFA

REGULATIONS FOR THE QUALIFICATION AND SCHEDULE OF UNITS

Not Applicable

SUMMARY OF COMPETENCY STANDARDS

Code	Competency Standards	Level	Credits	Category
102200843	Comply with Work Health and Safety Policies	1	3	Generic
041700838	Obey the Workplace Policies and Procedures	1	2	Generic
001100850	Follow Basic Communication Skills (General)	1	5	Generic
061100855	Operate Computer Functions (General	1	5	Generic
102200844	Comply Personal Health and Safety Guidelines	2	3	Generic
041700839	Communicate the Workplace Policy and Procedure	2	2	Generic
001100851	Perform Basic Communication (Specific)	2	3	Generic
061100856	Perform Basic Computer Application (Specific)	2	4	Generic
071400935	Apply Electric Circuit Concepts	2	20	Technical
071400936	Install Automation Instruments	2	15	Technical
071400937	Perform Basic computer operations	2	6	Functional
102200846	Apply Work Health and Safety Practices (WHS)	3	3	Generic
041700840	Identify and Implement Workplace Policy and Procedures	3	2	Generic
001100852	Communicate at Workplace	3	3	Generic
061100858	Perform Computer Application Skills	3	4	Generic
041300867	Manage Personal Finances	3	3	Generic
071400938	Perform Programmable Logic Controller (PLC) Operations	3	60	Technical
071400939	Develop Human Machine Interface (HMI)	3	15	Technical
102200848	Contribute to Work Related Health and Safety (WHS) Initiatives	4	3	Generic
041700841	Analysis Workplace Policy and Procedures	4	3	Generic

001100853	Perform Advanced Communication	4	3	Generic
061100858	Develop Advance Computer Application Skills	4	4	Generic
041300869	Manage Human Resource Services	4	2	Generic
041300860	Develop Entrepreneurial Skills	4	3	Generic
071400940	Configure AC Drives and Motors	4	35	Technical
071400941	Operate Industrial Robot	4	20	Technical

Packaging of Qualifications

The national vocational qualifications are packaged as per following:

Configure AC Drives and Motors	
Operate Industrial Robot	National Vocational Certificate Level-4 in Industrial Automation (Senior Automation Technician
Establish and maintain the occupational health and safety system	
Perform Advanced Communication	
Perform Remedial Measures at Work to Manage Waste	
Perform Programmable Logic Controller (PLC) Operations	
Develop Human Machine Interface (HMI)	National Vocational Certificate Level-3 in Industrial Automation (Automation Technician
Ensure Health, hygiene and safety of other individuals at work	
Take measures to reduce the Pollution	
Communicate at workplace	
Apply Electric Circuit Concepts	
Install Automation Instruments	National Vocational Certificate Level-2 in Industrial Automation (Assistant Automation Technician)
Maintain Personal Health, hygiene and Safety	
Perform basic communication Skills	
Dispose the waste material	
Demonstrate Basic Numeracy Skills	
Perform Basic computer operations	

102200843 Comply Work Health and Safety Policies

Overview: This unit describes the performance outcomes, skills and knowledge required to apply general work health and safety requirements in the workplace. Communicate work and health safety assess at work place. It describes generic work health and safety responsibilities applicable to employees without managerial or supervisory responsibilities.

Competency Units	Performance Criteria
CU1. Work safely at work place	**P1.** Identify relevant organizational safety policies and procedures **P2.** Categorize tools and equipment as per requirements **P3.** Maintain tools and equipment **P4.** Follow established safety procedures during work activities **P5.** Identify existing or potential safety issues to designated persons **P6.** Report work-related incidents and accidents to supervisor **P7.** Take necessary measures to minimizing risks
CU2. Communicate work health and safety (WHS) assess at work place	**P1.** Raise work health and safety issues with supervisor. **P2.** Contribute to workplace meetings and other consultative processes for work health and safety management at the workplace **P3.** Make suggestions for improving work health and safety practices
CU3. Minimize risks to personal safety at work place	**P1.** Identify situations that may endanger the personal safety **P2.** Document the incident regarding personal safety at work place **P3.** Eliminate workplace hazards regarding personal safety **P4.** Identify damaged items and equipment for personal safety **P5.** Notify supervisor regarding damaged items and equipment for personal safety

CU4. Minimize risks to public safety	P1. Identify situations that may endanger the public safety
	P2. Document the incident at work sites
	P3. Eliminate workplace hazards at work sites
	P4. Identify damaged items and equipment related to public safety
	P5. Notify Situation that may endanger situation for safety measures.

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

K1: Identify the commonly used tools and equipment used at workplace.

K2: Rights and responsibilities of employers and employees

K3: Consultative processes to manage and monitor health and safety issues to enable active participation in maintaining a safe workplace

K4: State potential hazards in the workplace

K5: State commonly used hazard signs and safety symbols

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

Identify health and safety policies to maintain and avoid any unwanted incident.

041700838 Obey the Workplace Policies and Procedures

Overview: This unit describes the skills and knowledge required to develop and implement a workplace policy & procedures and to modify the policy to suit changed circumstances. It applies to individuals with managerial responsibilities who undertake work developing approaches to create, monitor and improve strategies and policies within workplaces and engage with a range of relevant stakeholders and specialists

Competency Units	Performance Criteria
CU1. Obey the workplace personal appearance and hygiene	**P1.** Wear suitable clothes for the workplace and respect local and cultural contexts **P2.** Meet specific company dress code requirements
CU2. Follow work ethics	**P1.** Follow company value/ ethics code/ conduct policies and guidelines **P2.** Use company resources in accordance with company ethical standards **P3.** Conduct personal behavior and relationships in accord with company policy & procedures **P4.** Demonstrate ethical behavior with co-workers **P5.** Report work incident situations or resolve accordingly
CU3. Demonstrate the Work place behaviors	**P1.** Practice the positive behavior **P2.** Avoid arguing **P3.** Adopt flexibility in behavior to accept the resistance
CU4. Communicate workplace policy & procedures	**P1.** Listen directions carefully **P2.** Ask relevant questions politely **P3.** Avoid to use abusive language/ expression **P4.** Respect co-workers and others
CU5. Review the implementation of workplace policy & procedures	**P1.** Ensure proper implementation of policies **P2.** Enlist the gaps for improvement **P3.** Follow the feedback, if any

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

K1: Rules, regulations and SOPs applicable to the organization

K2: Turnaround time to achieve target/goal.

K3: Operational hierarchal levels in an organization.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

Follow work place policy personal appearances adopting company values/ ethics/ codes and broacher policies for ensuring work place SOP's

001100850 Follow Basic Communication Skills (General)

Overview: After successful completion of this module you will be able to listen attentively, develop non-verbal communication, and identify communication barriers, interview preparation for job and different communication platforms in the workplace and throughout your career.

This unit of competency is designed to manage the workers and other personnel that can help in improving work quality and quantity through basic communication skills

Competency Units	Performance Criteria
CU1. Adopt Effective listening to Skills	**P1.** Listen attentively to others to improve communication skills **P2.** Avoid interrupting while listening others **P3.** Ask questions to ensure understanding **P4.** Receive and follow instructions as given by supervisor **P5.** Give the speaker regular feedback to communicate appropriately
CU2. Develop Nonverbal communication with peers	**P1.** Maintain eye contact to improve communication **P2.** Use facial expressions and gestures **P3.** Use Body language to communicate appropriately **P4.** Participate within Peers
CU3. Prepare for Interview to get a job	**P1.** Prepare yourself for interview to employer **P2.** Follow schedule according to the sequence of interview **P3.** Use communication techniques used while appearing in interview **P4.** Provide basic evidence of related skill **P5.** Respond appropriately to strong client emotional reactions
CU4. Use communication platform at workplace	**P1.** Convey message using different communication plate forms • Face to face • Video chat • Phone calls/messages • Social Media

CU5. **Identify communication barriers to improve interpersonal skills**	**P1.** Identify communication barriers to improve communication skills with each other.i.e.
	• Attitudinal barrier
	• Physical Barrier
	• Long differences
	• Conflicting information
	• Differing status, position /self-expression
	P2. Use strategies to overcome these barriers in the client-counsellor relationship

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

K1: Minimizing communication barriers

K2: Listening, and responding with an open mind in a more effective way.

K3: appropriate communication methods.

K4: verbal and non-verbal messages appropriately.

K5: Confidence building

K6: Body language

K7: Appropriate Voice tone

K8: Interpersonal skills

K9: listening Skills

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

• Find a job through social media resources
  1. Prepare yourself to appear in interview by following points:
     o Effective listening skills
     o Body language

- Work in groups of 3-5 members.

    1. Think of a situation when you tried to communicate with another person. Or when somebody tried to communicate with you, and it failed.

    2. Think about the problems or barriers that interfered with the communication.

        o List the reasons for failure identified by your group.

- Non-verbal communication

    Have activity cards:

    - o Worried
    - o Happy
    - o Disappointed
    - o Laughing
    - o Annoying

Participants to draw one of the activity cards. Without speaking, communicate the feeling or emotion on the card to the rest of the group. Have one participant at time get up in front of the group.

061100855 Operate Computer Functions (General)

Overview: The competency Standard describe skills and knowledge required to setup a computer system, organize files in folders, and shutdown a computer system.

Competency Units	Performance Criteria
CU1. Set up the computer for use	**P1.** Identify physical components of computer **P2.** Identify peripheral devices of the computer **P3.** Connect all components of computer **P4.** Follow procedures to turn on the computer system
CU2. Organize files in folder	**P1.** Create folders/subfolders with suitable names **P2.** Save files in relevant folders. **P3.** Rename and move folders in different drives.. **P4.** Move folders and files using drag and drop techniques **P5.** Save folders and files on different media **P6.** Search for folders/subfolders and files using appropriate tool bars **P7.** Delete Folder files **P8.** Restore deleted folder files
CU3. Shut down computer system	**P1.** Save any work to be retained **P2.** Close open application programs correctly **P3.** Shut down computer **P4.** Switch off any unused peripheral devices **P5.** Ensure computer safety

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

K1: Basic parts of a computer
K2: Definition of computer
K3: Definition of Drives
K4: enlist computer component

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Switch on the computer
- Attach Computer component
- Switch on Peripheral devices
- Make a folder in any partition(drive) in hard disk
- Give name to the folder
- Save file in the folder
- delete the folder/File
- Shut down computer

The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments

102200844 Comply with Personal Health and Safety Guidelines

Overview: This Competency Standard identifies the competencies required to protect/apply occupational Safety, health and Environment at workplace according to the industry's approved guidelines, procedures and interpret environmental rules/regulations. Trainee will be expected to identify and use Personal Protective Equipment (PPE) according to the work place requirements. The underpinning knowledge regarding Observe Occupational Safety and Health (OSH) will be sufficient to provide the basis for the job at workplace.

Competency Units	Performance Criteria
CU1. Identify Personal Hazards at Workplace	P1: Identify risk to personal health P2: Identify hygiene and safety at work place P3: Identify processes P4: Identify tools, equipment and consumable materials that have the potential to cause harm P5: Report, identified risk to Health, hygiene and safety to concerned
CU2. Apply Personal Protective and Safety Equipment (PPE)	P1: List the Personal Protective equipment P2: Select personal protective equipment in terms of type and quantity according to work orders. P3: Wear personal protective equipment according to job requirements. P4: Clean personal protective equipment P5: Stored Personal Protective equipment in proper place after use.
CU3. Comply with Occupational Safety and Health (OSH)	P1: Maintain cleanliness and hygiene as per organizational policy P2: Comply with Health, hygiene and safety precautions before starting work P3: Comply organizational Health, hygiene and safety guidelines during work P4: Deal with resolvable problems according to prescribed

	procedures
	P5: Report un resolvable problems to concerned
	P6: Place the tools equipment etc at their prescribed place after completion of work
CU4. Dispose of hazardous Waste/materials from the designated area.	P1: Identify hazardous waste materials which needs to be disposed off
	P2: Segregate hazardous or non-hazardous waste carefully from the designated area as per approved procedure
	P3: Use proper disposal hazardous containers for dispose-off hazardous waste as per procedure
	P4: Take necessary precautions like putting masks and gloves while disposing hazardous waste/ materials as per standard operating procedure

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

K1: Explain safety rules and regulations of organization

K2: List Personal protection and safety Equipment

K3: Describe meaning of Safety signs and symbols

K4: Demonstrate understanding of safety related Standard Operating Procedure/guidelines

K5: Describe waste disposal SOPs

K6: Explain best practices relating to clean and safe work environment

Critical Evidence(s) Required

The candidate needs to produce following critical evidence (s) to be competent in this

competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of maintaining personal health and hygiene practices. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

041700839 Communicate the Workplace Policy and Procedure

Overview: This unit describes the performance outcomes, skills and knowledge required to develop communication skills in the workplace. It covers gathering, conveying and receiving information, along with completing assigned written information under direct supervision.

Competency Units	Performance Criteria
CU1. Identify workplace communication procedures	**P1.** Identify organizational communication requirements and workplace procedures with assistance from relevant authority **P2.** Identify appropriate lines of communication with supervisors and colleagues. **P3.** Seek advice on the communication method/equipment most appropriate for the task
CU2. Communicate at workplace	**P1.** Use effective questioning, and active listening and speaking skills to gather and convey information **P2.** Use appropriate non-verbal behavior at all times **P3.** Encourage, acknowledge and act upon constructive feedback
CU3. Draft Written Information	**P1.** Identify and comply with required range of written materials in accordance with organizational policy and procedures **P2.** Draft and present assigned written information for approval, ensuring it is written clearly, concisely and within designated timeframes. **P3.** Ensure written information meets required standards of style, format and detail. **P4.** Seek assistance and/or feedback to aid communication skills development
CU4. Review Documents	**P1.** Check draft for suitability of tone for audience, purpose, format and communication style **P2.** Check draft for readability, grammar, spelling, sentence and paragraph construction and correct any inaccuracies or gaps in content. **P3.** Check draft for sequencing and structure

| | **P4.** Check draft to ensure it meets organizational requirements |
| | **P5.** Ensure draft is proofread, where appropriate, by supervisor or colleague |

Knowledge and Understanding

K1: Key provisions of relevant regulations that may affect aspects of business operations, such as privacy laws

K2: Organizational policies, plans and procedures.

K3: Barriers to communication

K4: Communication model

K5: Verbal and written communication techniques

Critical Evidence(s) Required

A person who demonstrates competency in this unit must be able to provide evidence of the ability to develop communication skills in the workplace. It covers gathering, conveying and receiving information, along with completing assigned written information under direct supervision. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

001100851 Perform Basic Communication (Specific)

Overview: This unit describes the skills and knowledge required to assist in the development of communication competence by providing information regarding different forms of communication and their appropriate use.

By the end of this program, learners will be able, to communicate more effectively and efficiently by: working in a team, follow supervisor's instructions and develop generic communication work skills at workplace

Competency Units	Performance Criteria
CU1. Communicate in a team to achieve intended outcomes	**P1.** Treat team members with respect **P2.** Maintain positive relationships to achieve common organizational goals **P3.** Get work related information from team **P4.** Identify interrelated work activities to avoid confusion **P5.** Adopt communication skills, which are designed in a team. **P6.** Identify problems in communication with a team **P7.** Resolve Communication barrier through discussion and mutual agreement
CU2. Follow Supervisor's instructions as per organizational SOPs	**P1.** Receive the instructions from Supervisor **P2.** Carry out the instructions of the supervisor **P3.** Report to the supervisor as per organizational SOPs
CU3. Develop Generic communication skills at workplace	**P1.** Develop basic reading skills **P2.** Develop Basic writing Skills **P3.** Develop basic listening skills

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

K1: Basic Learn and understand Types of communication

K2: Basic Reading Skills

K3: Basic Writing skills

K4: Basic Verbal communication skills

K5: Basic Problem-solving skills

K6: Basic Self-Management Skills

K7: Basic Technology Skills

K8: Basic Interview Skills

K9: Basic Workplace dress code

K10: Basic The role of team members and functionality of the teams

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Make a list of appropriate communication skills with colleagues and supervisors

061100856 Perform Basic Computer Application (Specific)

Overview: This unit describes the skills and knowledge required to use spreadsheet to prepare a page of document, develops familiarity with Word, Excel, Access, PowerPoint, email, and computer graphics basics.

It applies to individuals who perform a range of routine tasks in the workplace using a fundamental knowledge of spreadsheets, Microsoft office and computer graphics in under direct supervision or with limited responsibility.

Competency Units	Performance Criteria
CU1. Create Word Documents	P1. Open word processing application
	P2. Create a word document
	P3. Customize page layout with relevant name setting
	P4. Set up page in a word document
	P5. Edit word document as required
	P6. Use simple formatting tools when creating the document
	P7. Save word document to directory
	P8. Insert table in a word document
	P9. Insert appropriate images into document as necessary
	P10. Insert header/footer in a word document
	P11. Insert section break in a word document
	P12. Set style in word document
	P13. Select basic Print settings
	P14. Print the document
CU2. Use internet for Browsing	P1. Use search engines to open website
	P2. Search data on different topics
	P3. Refine search to increase relevance of information or content
	P4. Navigate a website to access the information or content required

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

K1: Describing formatting styles and their effect on formatting, readability and appearance of documents

K2: Outline purpose, use and function of word-processing software.

K3: Editing in MS Word

K4: Formatting in MS word

K5: Use of different search engines

K6: Use of different web pages

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Identify the components of computer
- Follow organizational ergonomic work health and safety (WHS) requirements and practices
- Create, open and retrieve documents using customized basic settings
- Format documents by creating tables and adding text, objects and images
- Save and prints documents.
- Download data through web browser

071400935 Apply Electric Circuit Concepts

Overview

This Competency Standard identifies the competencies required to Apply Electric Circuit Concepts in accordance with the approved guidelines and procedures. Trainee will be expected to measure and calculate the electrical quantities according to the requirement. Trainee will be able to use electrical diagrams, symbols and also install DC/AC circuits wiring. The underpinning knowledge regarding electric circuits will be sufficient to provide the basis for trainee's work.

Competency Units	Performance Criteria
1. Perform measurement of electrical quantities using meters	P1. Test electrical components as per requirement P2. Test electrical quantities as per requirement
2. Perform calculations of electrical quantities	P1. Calculate current, voltage, resistance and power of a circuit as per requirement P2. Solve series & parallel circuits as per requirement
3. Use electric diagrams and symbols	P1. Identify electrical and control symbols for components as per requirement. P2. Draw electrical single line diagrams manually as per requirement.
4. Install DC Circuits wiring	P1. Select wiring tools, components, accessories and cables as per requirement. P2. Connect DC components as per requirement
5. Install AC circuit wiring	P1. Select wiring tools, accessories and cables as per requirement. P2. Connect AC components as per requirement
6. Terminate cables and circuit accessories	P1. Select tools and accessories as per requirement P2. Lay down cables as per requirement

Knowledge and Understanding

The trainee must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Active and Passive elements
- Ohm's Law's and applications
- Series and Parallel Circuits
- Difference between AC and DC Circuits
- AC and DC voltage levels and safety measures
- Power and Energy Calculations
- AC and DC Sources
- The components of power electronics
- The components of digital electronics
- Logic Gates types
- Single Phase and three Phase Circuits
- Various Electrical and Control Symbols
- Different types of Electrical Diagrams
- Wiring Techniques

Critical Evidence(s) Required

The trainee needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Measure AC/DC Voltages
- Measure AC/DC Currents
- Measure resistance, inductance and capacitance
- Solve series & parallel circuits and verify results.
- Draw the wiring diagram of different DC circuits.
- Draw the single line diagram of AC circuits.
- Perform wiring of DC circuits
- Perform wiring of Latching and Unlatching circuits using Relays.
- Perform wiring of Direct Online (DOL) circuits using Relays.
- Perform wiring of reverse/forward operations of Motor using Relays/Limit Switches.
- Perform wiring of Star Delta starter using Relays.
- Perform wiring of Stair Case Circuit.
- Perform logic gates using Push Buttons and Indicators.

071400936 Install Automation Instruments

Overview

This Competency Standard identifies the competencies required to Install Automation Instruments in accordance with the approved guidelines and procedures. Trainee will be able to apply acquired skills in installation of digital, analogue instrument. Trainee will also be able to integrate hydraulic and pneumatic equipment. The underpinning knowledge regarding the Installation of Automation Instruments will be sufficient to provide the basis for trainee's work.

Competency Units	Performance Criteria
1. Install Digital Instruments	P1. Select tools and accessories as per requirement P2. Identify digital instruments as per requirement P3. Install digital instruments as per requirement P4. Operate digital instruments as per requirement
2. Install Analogue Instruments	P1. Select tools and accessories as per requirement P2. Identify Instruments for different output signals as per requirement P3. Install Analogue Instruments as per requirement
3. Install Hydraulic and Pneumatic Equipment	P1. Select tools as per requirement P2. Identify hydraulic and pneumatic symbols P3. Draw hydraulic and pneumatic systems diagrams manually P4. Identify different hydraulic components and instruments as per requirement P5. Install hydraulic components and instruments as per requirement P6. Operate hydraulic equipment as per requirement P7. Identify different Pneumatic components and instruments as per requirement P8. Install pneumatic components and instruments as per requirement P9. Operate pneumatic equipment as per requirement P10. Troubleshoot hydraulic and pneumatic system

Knowledge & Understanding

The trainee must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Digital instruments, types and working
- Analogue instruments, types and working
- Pneumatic system and operation
- Hydraulic system and operation

Critical Evidence(s) Required

The trainee needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Install digital instruments
- Perform testing of digital instruments
- Install analogue instruments
- Measure different analogue signals using DMM.
- Install Pneumatic Control System.
- Operate pressure and temperature switches
- Operate Pneumatic Cylinders using solenoid operating valve through sensors/Push Button/Selector Switch.
- Operate Compressor unit using Pneumatic Pressure Switches.
- Install Hydraulic Control System.
- Operate Hydraulic Cylinders using solenoid operating valve through sensors/Push Button/Selector Switch.
- Operate Hydraulic Pump using Hydraulic Pressure Switches

071400937 Perform Basic Computer Operations

Overview

This Competency Standard identifies the competencies required to Perform Basic Computer hardware, software, applications and troubleshooting. Trainee will be able to apply acquired skills in operating a computer system and software such as MS Word, MS PowerPoint, MS Excel, MS Visio as well as installation and troubleshooting of operating system and software. The underpinning knowledge regarding basic computer operations will be sufficient to provide the basis for trainee's work.

Competency Units	Performance Criteria
1. Configure Computer System	P1. Connect computer components and peripherals as per requirement P2. Install drivers and applications according to the software specification P3. Troubleshoot applications to trace and fix faults in a specific application to bring it in a running condition
2. Prepare a MS word document	P1. Compose a document as per the requirement. P2. Format Word Document according to given requirements. P3. Print Word Documents according to requirements.
3. Prepare Spreadsheet in MS Excel	P1. Develop a worksheet as per given data. P2. Format the worksheet according to given criteria. P3. Apply Formulas according to the requirement. P4. Generate Charts/Graphs according to the given data. P5. Print Worksheet according to requirements.
4. Prepare presentation in MS Power Point	P1. Insert Slides with different Layouts according to requirements of presentation. P2. Insert text, tables, images, etc. according to the requirement. P3. Apply a set of effects to animate the slide according

	to requirement.
	P4. Apply Slide Transitions on Slides according to requirement.
	P5. Apply Sound Effects on Objects/text/images according to requirement.
	P6. Present a presentation according to 7Cs of communication.
5. Prepare Electrical Drawings in MS Visio	P1. Set the Page Layout, size and format as per requirement.
	P2. Identify and Insert the Electrical symbols as per requirement.
	P3. Modify the given electrical drawings.
	P4. Print the final electrical drawings.

Knowledge & Understanding

The trainee must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Operating systems
- Hardware and Software
- Troubleshooting
- Internet and E-mailing
- Hyperlink and referencing
- Printing
- Formulas
- Short Keys
- WPM (Word Per Minute)

Critical Evidence(s) Required

The trainee needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Install MS Office Application correctly
- Prepare a formatted document using MS Word
- Enter data into the respective columns and rows as per given instructions
- Set page layouts and margins
- Apply any slide transition on entire presentation.

Prepare an electrical drawing using Ms Visio

102200846 Apply Work Health and Safety Practices (WHS)

Overview: This unit describes the skills to work with safety and participate in hazard assessment activities, follow emergency procedures and participate OHS practices in process.

Competency Units	Performance Criteria
CU1. Implement safe work practices at work place	**P1.** Implement relevant rules and procedures of WHS at work place. **P2.** Comply with duty of care requirements **P3.** Use personal protective equipment according to safe work practices **P4.** Contribute to WHS consultative activities **P5.** Raise WHS issues with relevant personnel
CU2. Participate in hazard assessment activities a work place	**P1.** Identify hazards or WHS issues in the workplace to relevant personnel **P2.** Assess and control risks according to own level of responsibility, in line with workplace procedures **P3.** Report hazards or WHS issues in the workplace to relevant personnel **P4.** Document risk control actions as required
CU3. Follow emergency procedures at workplace	**P1.** Report emergencies or incidents promptly to relevant personnel **P2.** Deal with emergencies in line with own level of responsibility **P3.** Implement evacuation procedures as required
CU4. Participate in OHS consultative processes	**P1.** Contribute to workplace meetings, inspections or other consultative activities **P2.** Raise OHS (Occupational Health and Safety) issues with designated persons in accordance with organizational procedures **P3.** Take actions to eliminate workplace hazards or to reduce risks

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

K1: Outline the WHS rights and responsibilities that apply to own role

K2: Explain the term duty of care

K3: Describe typical health and safety roles in the workplace

K4: List and describe common safety signs and symbols

K5: Explain procedures for reporting hazards, risks, incidents and accidents

K6: Identify and describe common hazards and major causes of accidents relevant to the workplace

K7: Explain what the term risk control means

K8: List and describe potential emergency situations and how to respond to them

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

Demonstrate evidences of the Health and safety Processes to avoid any incident.

041700840 Identify and Implement Workplace Policy and Procedures

Overview: This unit describes the skills and knowledge required to develop and implement a workplace policy & procedures and to modify the policy to suit changed circumstances. It applies to individuals with managerial responsibilities who undertake work developing approaches to create, monitor and improve strategies and policies within workplaces and engage with a range of relevant stakeholders and specialists.

Competency Units	Performance Criteria
CU1. Identify workplace policy & procedures	**P1.** Identify the workplace policy & procedures **P2.** Apply appropriate strategies that can be used to measure whether your workplace health and safety obligations are being met. **P3.** Assure the policies are realistic, resources and personnel to implement **P4.** Implement the policy & procedures that reflects the organizations commitments **P5.** Ensure the appropriate methods of implementation, outcomes and performance indicators
CU2. Implement workplace policy & procedures	**P1.** Apply and assign responsibility for recording systems to track continuous improvements in policy & procedures **P2.** Implement strategies for continuous improvement in effective and efficient information
CU3. Communicate workplace policy & procedures	**P1.** Communicate procedures to help implement workplace policy **P2.** Inform those involved in implementing the policy about expected outcomes, activities to be undertaken and assigned responsibilities
CU4. Review the implementation of workplace policy & procedures	**P1.** Identify the trends that may require remedial actions **P2.** Record the trends that may require remedial actions. **P3.** Ensure policy and procedures as required are made for continuous improvement of performance

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

K1: Legislation, regulations and codes of practice applicable to the organization

K2: internal and external sources of information and organizational policy & procedures

K3: Typical barriers to implementing policies and procedures in an organization.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

Identify evidences of the ability to implement work place policy and procedures. briefly identify work place procedures to avoid incident.

001100852 Communicate at Workplace

Overview: This unit describes the performance outcomes, skills and knowledge required to develop communication skills in the workplace. It covers gathering, conveying and receiving information, along with completing assigned written information under direct supervision.

Competency Units	Performance Criteria
CU1. Communicate within the organization	**P1.** Communicate within a department **P2.** Communicate with other departments. **P3.** Use various media to communicate effectively **P4.** Communicate orally and written
CU2. Communicate outside the organization	**P1.** Deal with vendors **P2.** Deal with clients/customers **P3.** Interact with other organisations **P4.** Use various media to communicate effectively **P5.** Work with people of different cultures / backgrounds
CU3. Communicate effectively in workgroup	**P1.** Assess the issues to provide relevant suggestion to group members **P2.** Resolve the issues/ problems /conflicts within the group **P3.** Arrange group working sessions to increase the level of participation in the group processes **P4.** Communicate messages to group members clearly to ensure interpretation is valid **P5.** Communicate style /manner to reflect professional standards/ awareness of appropriate cultural practices **P6.** Act upon constructive feedback

CU4. Communicate in writing	**P1.** Identify relevant procedures for written information
	
	P2. Use strategies to ensure correct communication in writing .i.e.
	
	   • correct composition
	
	   • clarity
	
	   • comprehensiveness
	
	   • accuracy

		• appropriateness
	P3.	Draft assigned written information for approval, ensuring it is written within designated timeframes
	P4.	Ensure written information meets required standards of style, format and detail
	P5.	Seek assistance / feedback to aid communication skills development

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

K1: Importance of intra and inter organizational communication

K2: Basics of business communication

K3: Defining Modes of communication

K4: Effective communication in workgroup

K5: Communicating through writing

K6: The importance of teamwork

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

In your current position, what types of written communication do you use most often? (List them all).

061100858 Perform Computer Application Skills

Overview: This unit describes the skills and knowledge required to use spreadsheet applications, prepare in page documents, develops familiarity with Word, Excel, Access, PowerPoint, email, and computer graphics basics.

It applies to individuals who perform a range of routine tasks in the workplace using a fundamental knowledge of spreadsheets, Microsoft office and computer graphics in under direct supervision or with limited responsibility.

Competency Units	Performance Criteria
CU1. Prepare In-page documents as per required information	**P1.** Set keyboard preferences according to information requirements **P2.** Layout Page according to information requirements **P3.** Toggle between Languages **P4.** Identify the usage of tool bar **P5.** Insert Columns as per requirement **P6.** Print the document
CU2. Prepare Spreadsheets as per required information	**P1.** Create workbook according to information requirements **P2.** Insert sheet according to information requirements **P3.** Enter basic formulae / functions using cell referencing when required **P4.** Correct formulas when error messages occur **P5.** Use a range of common tools during spreadsheet development **P6.** Edit columns and rows within the spreadsheet Filter data **P7.** Save the spreadsheet to a folder on a storage device **P8.** Format spreadsheet using formatting features as required **P9.** Incorporate object and chart in spreadsheet **P10.** Print spreadsheet
CU3. Use MS Office as per required information	**P1.** Use Microsoft Word for documentation **P2.** Use Microsoft Excel for documentation **P3.** Use Microsoft PowerPoint for presentation **P4.** Perform OneNote

	P5.	Perform Outlook for emails
	P6.	Perform Publisher applications
CU4. Perform computer graphics in basic applications	**P1.**	Perform graphic fundamentals in basic applications
	P2.	Draw Points and lines to make images
	P3.	Draw Dots in space to make images
	P4.	Draw lightening blot Shapes to make images
	P5.	Enlarge circles and rectangles to block in forms
CU5. Create Email account for communications	**P1.**	Make email account for communications
	P2.	. Compose text of an email message according to organizational guidelines as required
	P3.	Create an automatic signature for the user
	P4.	Attach files to email message where required
	P5.	Send email message
	P6.	Reply to / forward a received message using available features
	P7.	Save an attachment to the relevant folder
	P8.	Save email message using available settings
	P9.	Adjust email accounts to restrict and quarantine possible email security problems
		• Print email message as per requirements

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

K1: List basic technical terminology related to reading help files and prompts

K2: Explain the effect of formatting and appearance on the readability and usability of spreadsheets

K3: Outline log-in procedures relating to accessing a personal computer (PC)

K4: Describe the purpose, use and function of spreadsheet applications.

K5: Understand **MS Word** to create documents, flyers, publications

K6: Understand **MS PowerPoint** to create presentations

K7: Understand **MS Excel** to store, organize, and manipulate data

K8: Understand **OneNote** to organize data you collect including handwritten notes, drawings, screen captures, audio clips, and more

K9: Understand of Publisher to create extensive publications, posters, flyers, menus

K10: Understand **Outlook** to manage email and calendars, to do lists, and contacts

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Create spreadsheets
- Customize basic settings
- Format spreadsheets
- Apply basic formulas
- Insert objects and charts in spreadsheets
- Save and print spreadsheets.

041300867 Manage Personal Finances

Overview: This unit of competency describes the outcomes required to manage develop, implement and monitor a personal budget in order to plan regular savings and manage debt effectively.

Competency Units	Performance Criteria
CU1. Develop a personal budget	**P1.** Calculate current living expenses using available information to prepare a personal budget.
	P2. Keep a record of all income and expenses for a short period of time to help estimate ongoing expenses.
	P3. Subtract total expenses from total income to determine a surplus or deficit budget for the specified period.
	P4. Find reasons for a deficit budget and ways to reduce expenditure identified.
	P5. Identify ways to increase income
CU2. Develop long term personal budget	**P1.** Analyze income and expenditure and set long term personal financial goals.
	P2. Develop a long-term budget based on the outcomes of short-term budgeting.
	P3. Identify obstacles that might affect the business
	P4. Formulate a regular savings plan based on budget
CU3. Identify ways to maximize future finances	**P1.** Determine sources to maximize personal income,
	P2. Get further education or training to maintain or improve future income.
	P3. Identify the need for debt to finance living and other expenses,
	P4. Determine the appropriate levels of debt and repayment.
	P5. Consolidate existing debt, where possible, to minimize interest costs and fees.
	P6. Seek professional money management services.

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

K1: Explain the abilities to plan and organize to keep records and monitor a personal budget

K2: Describe abilities to set and review goals

K3: Explain basic financial management and record keeping to enable development and management of a personal budget

K4: Describe benefits of financial goal setting and personal budgeting to enable effective management of personal finances

K5: Outline numeracy skills to compare income and expenditure

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

Demonstrates competency to provide evidence of the ability to manage personal finances. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

071400938 Perform Programmable Logic Controller (PLC) Operations

Overview

This Competency Standard identifies the competencies required to Perform Programmable Logic Controller Operations at work place in accordance with the approved guidelines and procedures. Trainee will be able to install Programmable Logic Controller and develop Programs for automation. Trainee will also be able to integrate digital, analogue, pneumatic and hydraulic control systems with Programmable Logic Controller (PLC). The underpinning knowledge regarding Programmable Logic Controller (PLC) will be sufficient to provide the basis for trainee's work.

Competency Units	Performance Criteria
1. Integrate Programmable Logic Controller	P1. Select tools and hardware as per requirement
	P2. Attach modules with PLC as per requirement
	P3. Install wiring of PLC with digital instruments
	P4. Install wiring of PLC with analogue instruments
	P5. Integrate pneumatic and hydraulic instruments with PLC as per requirement
2. Develop logic for Programmable Logic Controller	P1. Select software as per requirement
	P2. Program digital control operations via simulation as per application.
	P3. Program digital control operations with hardware as per application.
	P4. Program analogue control operations via simulation as per application.
	P5. Program analogue control operations with hardware as per application.

Knowledge and Understanding

The trainee must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- PLC Hardware and Software
- PLC Programming Languages
- Sourcing and Sinking wiring
- Configuration of hardware in software
- PLC programming using software
- analogue handling
- Proportional Integral Derivative (PID) Control
- Communication protocols for peripherals

Critical Evidence(s) Required

The trainee needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Integrate different modules with PLC
- Perform PLC wiring
- Connect PLC with other devices
- Perform logic Gates operation via simulation and PLC hardware
- Implement Stair Case Circuit via simulation and PLC hardware
- Execute Latching and Unlatching function via simulation and PLC hardware
- Execute Direct Online (DOL) via simulation and PLC hardware
- Perform reverse/forward operations of Motor Limit Switches via simulation and PLC hardware
- Perform Timer Operations in PLC
- Perform Counter Operations in PLC
- Perform Data Processing Operations in PLC
- Perform Arithmetic Operations in PLC
- Perform Sub Routine Operations in PLC

- Perform Analogue Operations in PLC

- Control Process Variables using PLC

- Control pneumatic system using PLC

- Control hydraulic system using PLC

- Perform Proportional Integral Derivative (PID) using PLC

071400939 Develop Human Machine Interface (HMI)

Overview

This Competency Standard identifies the competencies required to Develop HMI interface at workplace/industry in accordance with the guidelines and procedures. Trainee will be able to configure Human Machine Interface (HMI) and develop Graphical User Interface (GUI) and HMI programme and recipes. The underpinning knowledge regarding HMI will be sufficient to provide the basis for trainee's work.

Competency Units	Performance Criteria
1. Configure HMI	P1. Select HMI hardware, software and communication cables as per requirement.
	P2. Establish communication of HMI with other controllers
2. Develop graphical User Interface	P1. Design process diagram as per requirement
	P2. Configure tags as per requirement
	P3. Simulate GUI as per requirement
	P4. Integrate GUI with controller as per requirement
3. Develop HMI Programme & Recipes	P1. Create recipes in HMI as per requirement
	P2. Create alarms in HMI as per requirement
	P3. Create macros in HMI as per requirement
	Set security levels in HMI

Knowledge and Understanding

The trainee must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Communication protocols
- HMI and Programming software
- HMI Designing and Control System

Critical Evidence(s) Required

The trainee needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Interface HMI with PLC

- Draw the elements

- Create Data logging, bar & trends

- Implement different security levels

- Create Multiple screens in HMI

- Backup, restore & reset HMI

- Design recipies for different processes

- Design macro for different processes

- Design alarm for different processes

102200848 Contribute to Work Related Health and Safety (WHS) Initiatives

Overview: This unit describes the skills and knowledge required to manage the identification, review, development, implementation and evaluation of effective participation and consultation processes as an integral part of managing work health and safety (WHS).

Competency Units	Performance Criteria
CU1. Contribute to initiate work-related health and safety measures	**P1.** compile database on work-related health and safety **P2.** Identify measures that address legal obligations. **P3.** Consult with individuals/ parties to formulate measures and initiatives **P4.** Consult with individuals/parties to identify factors impacting on work-related health and safety **P5.** Participate in consultative meetings.

CU2. Contribute to establish work-related health and safety measures	**P1.** Assist in planning of work-related health and safety measures
	P2. Contribute to the development of work-related health and safety measures
	P3. Identify to implement work-related health and safety measures i.e.
	   • resourcing requirements,
	   • timelines
	   • responsibilities
	P4. Assist to implement work-related health and safety measures and initiatives i.e.
	   • scheduling
	   • liaison
	   • administering resources
	   • communication

CU3. Contribute to ensure legal requirements of WHS measures	**P1.** Identify WHS legal requirements
	P2. Apply knowledge of all aspects of WHS measures to
	   • Consultation
	   • workplace policies
	   • participation processes

	P3. Ensure, WHS measures are in accordance with legal requirements	
CU4. Contribute to review WHS measures	**P1.** Develop effective practices to review work-related health and safety measures **P2.** Assist individuals and parties related to WHS measures in following activities • preparing reports • communicating review • evaluating outcomes	
CU5. Evaluate the organization's WHS system	**P1.** Assess ongoing compliance with OHS (Occupational Health and safety) **P2.** Take feedback from concerned persons regarding WHS measures. **P3.** Assess the overall effectiveness of WHS management practices **P4.** Assist the development process of WHS measures in following ways • Suggest amendments • Document amendments • Implement amendments **P5.** Take feedback from concerned persons regarding WHS measures. **P6.** Communicate improvements in WHS Measures	

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

K1: Explain the application of relevant mandatory health monitoring, including biological monitoring, to help secure work health and safety

K2: Explain the difference between work-related health and safety measures and initiatives designed to meet specific legislative requirements and obligations, and those designed to support non-statutory health promotion programs, and give examples of each

K3: List factors that impact on work-related health and safety and their potential effects

K4: Identify internal and external sources of WHS information and data, and how to access them

K5: Outline organizational WHS and other relevant policies, procedures, processes and systems, including human resources

K6: Summarize relevant WHS legislation, other legislation (such as privacy and workers compensation) and common law rights and duties specific to work-related health and safety measures and initiatives

K7: Describe work-related health and safety measures and initiatives that either address specific legislative requirements and obligations, or support non-statutory health prevention programs, including:
- o The factors impacting on worker health and safety that they address
- o Effectiveness
- o Costs and benefits
- o Criteria for decisions regarding their implementation in a specific workplace
- o How they should be implemented.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to contribute work-related health and safety measures and initiatives. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

041700841 Comply with Workplace Policy and Procedures

Overview: This unit describes the skills and knowledge required to implement a workplace policy & procedures and to modify the policy to suit changed circumstances. It applies to individuals with managerial responsibilities who undertake work developing approaches to create, monitor and improve strategies and policies within workplaces and engage with a range of relevant stakeholders and specialists.

Competency Units	Performance Criteria
CU1. Manage work timeframes	**P1.** Complete work tasks within deadlines in according to order of priority **P2.** Supervisors are informed of any delays in work times or projects
CU2. Manage to convene meeting	**P1.** Develop agenda in line with meeting purpose **P2.** Select participants and notify them accordingly **P3.** Carryout meeting arrangements according to the time **P4.** Record the minutes of the meeting
CU3. Decision making at workplace	**P1.** Identify the problem, challenge or opportunity **P2.** Generate an array of possible solutions or responses **P3.** Evaluate the costs and benefits associated with each option **P4.** Assess the impact of the decision and modify the course of action as needed
CU4. Set and meet own work priorities at instant	**P1.** Take initiative to prioritize and facilitate competing demands to achieve organizational goals and objectives **P2.** Use technology efficiently and effectively to manage work priorities and commitments **P3.** Maintain appropriate work-life balance
CU5. Develop and maintain professional competence	**P1.** Assess personal knowledge and skills against competency **P2.** Participate in networks to enhance personal knowledge, skills and work relationships **P3.** Seek feedback from employees, clients and colleagues to develop and improve competence

CU6. Follow and implement work safety requirements	**P1.** Identify and report emergency incidents
	P2. Practice organizational policy and procedures for responding to emergency incidents
	P3. Identify and implement workplace procedures and work instructions for controlling risks

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

K1: Healthy work life balance

K2: Meeting terminologies, structures and arrangements

K3: Relevant organizational procedures and policies regarding meetings, chairing and minutes.

K4: Barriers to implement policies and procedures in an organization and possible strategies to address them.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to understand workplace policy and procedures. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments

001100853 Perform Advanced Communication

Overview: This unit describes the performance outcomes, skills and knowledge required to develop communication skills used professionally. It covers plan and organise work and conduct trainings at workplace, along with demonstrating professional skills independently.

Competency Units	Performance Criteria
CU1. Demonstrate professional skills	**P1.** Use different modes of communication to communicate • Speaking • Reading • Writing • Listening • Presentation • visual representation etc **P2.** Develop CV Skills according requirements **P3.** Upgrade professional skills by attending trainings, webinars, conferences etc. **P4.** Perform Continuous professional development as required at workplace **P5.** Develop interview skills
CU2. Plan and Organize work	**P1.** Identify task requirements. **P2.** Plan steps to complete tasks. **P3.** Review planning and organizing process. **P4.** Organize work.
CU3. Provide trainings at workplace	**P1.** Assess the need for training **P2.** Prepare trainees for the learning experience **P3.** Present training session **P4.** Support trainees in managing their own learning **P5.** Facilitate group learning **P6.** Provide opportunity for practice **P7.** Provide feedback on progress on trainees **P8.** Review delivery experience

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

K1: Explaining the training skills

K2: Identification of the professional skills

K3: Describing the advanced language skills

K4: Understanding of the assessment and trainees feedback methods

K5: Direct and indirect communication methods

K6: Explaining the need of the training type at the work place

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Job sheet
- Office emails and coordination reports
- Feedback proforma

Competency Units	Performance Criteria
061100858 Develop Advance Computer Application Skills	

Overview: This unit provides an overview of Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards, i.e. Data Entry, Power Point Presentation and managing data base and graphics for Design

It applies to individuals employed in a range of work environments who need to be able to present a set range of data in a simple and direct forms

Competency Units	Performance Criteria
CU1. Manage Information System to complete a task	**P1.** Perform Data Entry in MS office **P2.** Manage File/folder in MS office **P3.** Perform Scanning of document **P4.** Maintain Office Record in drives **P5.** Perform Printing of document **P6.** Search required Files/Folders **P7.** Convert Files in required formet. **P8.** Manage sizes of Files/Folders • Compress • Zip /unzip
CU2. Prepare Presentation using computers	**P1.** Prepare presentation as per requirements, i.e. • Open blank presentation and add text / graphics • Create a simple design for a presentation • Apply existing styles within a presentation • Use presentation template and slides to create a presentation • Use various tools to improve the look of the presentation • Save presentation to the appropriate storage device and folder with required name **P2.** Customize basic settings to meet user requirements **P3.** Format presentation as require • Develop organizational charts • Add objects and manipulate to meet presentation

	purposes
	• Modify slide layout, including text and colours, to meet presentation requirements
	• Save presentation in another format
	• Save to storage device and close presentation
	P4. Add slide show effect into presentation as required to enhance the presentation
	• Incorporate pre-set Animation
	• Apply Multimedia effects
	• Record Narration
	• Apply hyperlink
	• Apply video
	• Rehearse Timings
	• Test presentation for overall effect
	P5. Print the presentation
	• Select appropriate print format for presentation
	• Select preferred slide orientation
	• Add notes and slide numbers
	• Preview slides and run spell check before presentation
	• Print selected slides and submit presentation to appropriate person for feedback
	P6. Practice verbal presentation
	P7. Practice presentation through AV Aids
CU3. Use Microsoft Access to manage database	**P1.** Collect the data using a standard data base package.
	P2. Start access to manage database.
	• identify problem statement of Data
	• Develop a table with fields /attributes according to database usage/ user requirements
	• Create a primary key and establish an index for each table
	• Modify table layout and field attributes as required
	• Create a relationship between the two tables
	• Add data in a table according to information requirements

	• Add records as required
	• delete records as required
	• Save database to storage area
	• close down database to storage area
	• Apply criteria in the following Query
	• SQL view of Query
	• Wildcards of query
	• Query Criteria
	P3. Customize basic settings:
	• Adjust page layout to meet user requirements
	• Open and view different toolbars
	• Format font as appropriate for the purpose of the database entries
	• Create reports
	• Design reports to present data in a logical sequence
	• Modify reports to include or exclude additional requirements
	• Distribute reports to appropriate person in a suitable format
	P4. Create forms
	• Use a wizard to create a simple form
	• Open existing database and modify records through a simple form
	• Rearrange objects within the form to accommodate information requirements
CU4. Develop graphics for Design	**P1.** Develop graphic design concepts based on a thorough understanding of the communication need
	P2. Use design techniques confidently to produce designs
	P3. Integrate design tools skillfully to produce designs
	P4. Evaluate the success of completed designs to meet objectives
	P5. evaluate feedback from client / peers

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

K1: List basic technical terminology to read help files and prompts

K2: Outline the different types of formal and informal presentations

K3: Explain Power point presentation

K4: Segregation of Data

K5: Define the relation among data

K6: Define criteria in the query

K7: Creates and modify reports and forms.

K8: Outline basic database design principles

K9: Current graphic design software

K10: Discuss features of current and emerging technologies used in graphic design practice and the options they present for effective graphic design solution

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Design and develop a simple database using a standard database package
- Create, format and prepare presentations for distribution and display
- Customize basic settings
- Add slide show effects.
- Generate employment report from given data by using Microsoft Access.

041300869 Manage Human Resource Services

Overview: This unit describes the skills and knowledge required to plan, manage and evaluate delivery of human resource services, integrating business ethics. It applies to individuals with responsibility for coordinating a range of human resource services across an organization. They may have staff reporting to them.

Competency Units	Performance Criteria
CU1. Determine strategies for delivery of human resource services	**P1.** Analyze business strategy and operational plans to determine human resource requirements
	P2. Review external business environment that likely impact on organization's human resource requirements
	P3. Consult line and senior managers to identify human resource needs in their areas
	P4. Review organization's requirements for diversity in the workforce
	P5. Deliver human resource services that comply with business goals
	P6. Develop strategic action plan for delivery of human resource services
	P7. Develop roles and responsibilities of human resource team
	P8. Develop quality assurance policy
CU2. Manage the delivery of human resource services	**P1.** Communicate human resource strategies and services to internal and external stakeholders
	P2. Develop and negotiate service agreements between • The human resource team, • Service providers • Client groups
	P3. Document service specifications, performance standards and timeframes
	P4. Document /communicate service • Specifications, • Performance standards • Timeframes

		P5.	Monitor Quality assurance processes
		P6.	Ensure that services are delivered by appropriate providers, according to service agreements and operational plans
		P7.	Identify underperformance of human resource team or service providers
CU3.	**Evaluate human resource service delivery**	**P1.**	Establish Management information system for human resource services
		P2.	Conduct survey to determine level of satisfaction
		P3.	Analyze feedback of survey
		P4.	Recommend changes to service delivery
		P5.	Support agreed change processes across the organization
CU4.	**Manage integration of business ethics in human resource practices**	**P1.**	Ensure ethics in personal behavior
		P2.	Ensure code of conduct is observed across the organization,
		P3.	Observe confidentiality requirements in dealing with all human resource information
		P4.	Deal promptly with unethical behavior
		P5.	Ensure all persons responsible for human resource functions understand requirements regarding their ethical behavior

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

K1: Identify the key provisions of legal and compliance requirements that apply to managing human resources

K2: Summarize the organization's code of conduct

K3: Explain human resource strategies and planning processes and their relationship to business and operational plans

K4: Describe performance and contract management

K5: Explain how feedback is used to modify the delivery of human resources.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to manage human resource services. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

Performance requirements

This competency is to be assessed using standard and authorized work practices, safety requirements and environmental constraints. Demonstrated evidence is required of the ability to:

- Plan and manage human resource delivery within legislative, organizational and business ethics frameworks
- Communicate effectively with a range of senior personnel
- Identify and arrange training support where appropriate
- Calculate human resource return on investment within the organization.

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041300860 Develop Entrepreneurial Skills

Overview: This Competency Standard identifies the competencies required to develop entrepreneurial skills, in accordance with the organization's approved guidelines and procedures. You will be expected to develop a business plan, collect information regarding funding sources, develop a marketing plan and develop basic business communication skills. Your underpinning knowledge regarding entrepreneurial skills will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Develop a business plan	**P1.** Conduct a market survey to collect following information • Customer /demand • Tools, equipment, machinery and furniture with rates • Raw material • Supplier • Credit / funding sources • Marketing strategy • Market trends • Overall expenses • Profit margin **P2.** Select the best option in terms of cost, service, quality, sales, profit margin, overall expenses **P3.** Compile the information collected through the market survey, in the business plan format
CU2. Collect information regarding funding sources	**P1.** Identify the available funding sources based on their terms and conditions, maximum loan limit, payback time, interest rate **P2.** Choose the best available option according to investment requirement **P3.** Prepare documents according to the loan agreement requirement **P4.** Include the information of funding sources in the business plan

CU3. **Develop a marketing plan**	**P1.** Make a marketing plan for the business including product, price, placement, promotion, people, packaging and positioning **P2.** Include the information of marketing plan in the business plan
CU4. **Develop basic business communication skills**	**P1.** Communicate with internal customers e.g.: labor, partners and external customers e.g.: suppliers, customers etc., using effective communication skills **P2.** Use different modes of communication to communicate internally and externally e.g.: presentation, speaking, writing, listening, visual representation, reading etc. **P3.** Use specific business terms used in the market

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

K1: Explain the 7ps of marketing including product, price, placement, promotion, people, packaging and positioning

K2: Describe 7Cs of business communication

K3: Define different modes of communication and their application in the industry

K4: Enlist specific business terms used in the industry

K5: Enlist the available funding sources

K6: Explain how to get loan to start a new business

K7: Explain market survey and its tools e.g: questionnaire, interview, observation etc

K8: Describe the market trends for specific product offering

K9: State the main elements of business plan

K10: Explain how to fill the business plan format

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to develop Entrepreneurial Skills.

Performance requirements

- Conduct market survey and formulate business plans in terms of feasibility, investment potential, risk, and completeness.
- Demonstrate the use of both verbal and non-verbal business communication.
- Effectively present business ideas and profile

071400940 Configure AC Drives and Motors

Overview

This Competency Standard identifies the competencies required to Install Motor Drives at work place/industry in accordance with the approved guidelines and procedures. Trainee will be able to operate motors and drives and integrate AC drives with PLC at work place/industry. The underpinning knowledge regarding installation of motor and drives will be sufficient to provide the basis for trainee's work.

Competency Units	Performance Criteria
1. Operate AC Drives and Motors	P1. Select tools, motors and drives as per requirement P2. Perform wiring of motor, drives and controllers as per requirement P3. Set parameters of drives and controller as per requirement P4. Troubleshoot motor and drives
2. Integrate AC Drives with PLC	P1. Identify communication protocols of drives and controllers as per requirement P2. Control Servo Operation using PLC as per requirement P3. Control Variable Frequency Drive (VFD) operation using PLC as per requirement P4. Interface encoders with PLC and drives as per requirement P5. Troubleshoot drives communication

Knowledge and Understanding

The trainee must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

1. AC Motors and variable frequency drive
2. AC servo drives and motors
3. Rotary quadrature encoders
4. Interface protocols with AC drives

Critical Evidence(s) Required

The trainee needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Perform wiring of variable frequency drives (VFD)
- Perform wiring of Servo Drives
- Control speed and direction of Motor using VFD through parameters
- Control speed and direction of Motor using VFD through external terminals
- Control speed of Motor using VFD through reference signal
- Control speed and direction of Motor using VFD through PLC
- Perform close Loop Operation with Encoder for Induction Motor using PLC
- Control speed, direction and Position of Servo Motor using Servo Drive through Parameters (via Software)
- Control speed, direction and Position of Servo Motor using Servo Drive through external Terminals and Manual Pulse Generator (MPG)
- Control speed, direction and Position of Servo Motor using Servo Drive by Basic Operator Panel (BOP)
- Control speed, direction and Position of Servo Motor using Servo Drive through PLC
- Operate motor with different parameter settings (VFD and Servo)

071400941 Operate Industrial Robot

Overview

This Competency Standard identifies the competencies required to operate industrial robot at workplace/industry in accordance with the guidelines and procedures. Trainee will be able to develop programme for robotic applications, install and troubleshoot/debug robot. The underpinning knowledge regarding industrial robots will be sufficient to provide the basis for trainee's work.

Competency Units	Performance Criteria
1. Install industrial robot	P1. Select tools & accessories as per requirement
	P2. Connect cables and peripheral as per requirement
	P3. Integrate pneumatic / hydraulic system with robot as per requirement
	P4. Take safety measures as per requirement
2. Develop programme for robotic applications	P1. Develop program using Teach Pendant (online)
	P2. Simulate Robot Program as per requirement.
	P3. Develop program using Robots Software (offline)
3. Troubleshoot / Debug Robot	P1. Select Tools as per requirement
	P2. Edit and debug a program using Teach Pendant /Software
	P3. Troubleshoot Control Panel and Drives

Knowledge and Understanding

The trainee will be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Industrial Robots
- Robot Configurations
- Joints, Wrists , End Effector and work Envelope
- Singularities in robots
- Degree of Freedom (DOF)
- Position and Orientation of End Effector

- Teach Pendant and Robot Software
- Applications of Industrial Robots

Critical Evidence(s) Required

The trainee needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Perform Wiring of Robot with controller
- Connect the break release circuit with robot
- Program a Robot using Teach Pendant to perform following Operations:
    - Follow a Trajectory defined in drawing
    - lift an object , move it and Place it
    - Pick Blocks from a stack and Place them in a specific Order
    - Punch Holes in a paper sheet held in space
- Program a Robot using Robot Programming Software to perform following Operations:
    - Follow a Trajectory defined in drawing
    - Lift an object , Move it and Place it
    - Detect and move blocks to Place them in a specific Order
    - Punch Holes in a paper sheet held in space

- Perform Interfacing of Pneumatic and Hydraulic Components with Robots
- Check for any physical damage, abnormal wear or vibrations in mechanical unit and rectify it.

LIST OF TOOLS AND EQUIPMENT

Sr. #	Description	Quantity
1.	Long Nose Pliers	20
2.	Screw Driver Set Plus and Minus	20
3.	Soldering Iron	20
4.	Soldering let	20
5.	Soldering Sucker	20
6.	Pliers	20
7.	Cable Cutter	20
8.	Wire Stripper	20
9.	Crimping Tool (RJ-45, RJ-17)	10
10.	Cable Lug Crimper	10
11.	DMM (Digital Multi meter Clamp Type)	20
12.	PLC and HMI Trainer (Siemens, Mitsubishi, Allen Bradley, Fatek, Delta, ABB) Power Supply (5V, -10V, 10V, 24V), PLC CPU, Interface Modules, Digital I/Os Modules, Analogue I/Os Modules, Function Modules, Communication Cables, Touch Panel 10", Relevant Software with License Interface: Digital I/Os Components: Selector Switches, Toggle Switches, Binary Coded Decimal (BCD) Input Wheel, Proximity Switches LEDs, 7 Segment Display (BCD), Conveyor Belt with Actuators and Sensors, Relays, Magnetic Contactors Analogue I/Os Components: Temperature Sensors (PT-100 and Thermocouple), Humidity Sensors, Pressure Sensors, Multi Turn Variable (10 K), Analogue Voltmeter (-10 to 10 V), Ampere Meter (0	10

Sr. #	Description	Quantity
	to 20 mA), Flow Control Valves (4 to 20 mA)	
13.	Servo Trainer: Servo Motor and Drives with Brake (400 W) with Interface Cable, Connector and Accessories, Multi Turn Variable, Manual Pulse Generator (MPG), External variable Brake	5
14.	VFD Trainer: Induction Motor and VFD (1.5 KW) with Interface Cable and Encoder Feedback Module (ABZ Differential 5V), Connector and Accessories, Multi Turn Variable, Encoder 1024 PPR (ABZ Differential 5V)	5
15.	Pneumatic Trainer: Pneumatic Cylinders, Solenoid Valves (different types), Flow Control Valves(24 VDC), Pneumatic Gauge, Filter ,Regulator, Lubricator (FRL regulator), Pressure Switch, Compressor, Pneumatic Motor, Limit Switch, Power Supply (24V,10Amp), All Pneumatic Accessories	2
16.	Hydraulic Trainer: Hydraulic Cylinders, Solenoid Valves (different types), Flow Control Valves(24 VDC), Hydraulic Gauge, Filter ,Regulator, Lubricator (FRL regulator), Pressure Switch, Hydraulic Unit , Limit Switch, Power Supply (24V,10Amp), All Hydraulic Accessories, Pressure Release Valves , Proportional Control Valve, Hydraulic Motor,	2
17.	Industrial Robot (6DOF) with all accessories	2
18.	LAN Tester	5
19.	Cable Tracer	5
20.	Magnetic Contactors with Auxiliaries (24VDC coil, SK 10 Amp)	100

Sr. #	Description	Quantity
21.	Thermal and Electronic Overload (0 to 6 Amp)	10 Each
22.	Breakers with Auxiliaries (Single-Phase, Two Poles, Three Poles) 5Amp	30 Each
23.	Relays (5-Amp,24 VDC)	50
24.	Relays (1-Amp,220 VAC)	50
25.	Timer Relays	20
26.	Push Buttons	100
27.	24V Panel Indicators (Red, Yellow, Green)	100 Each color
28.	Selector Switches(Two Way, One Way)	20 Each
29.	Limit Switches	20
30.	Pressure Switches (up to 15 bar)	20
31.	Humidity Sensor	20
32.	Temperature Sensors-(PT100)	20
33.	Temperature Sensors-(Thermo Couple K Type)	20
34.	Temperature Controller (For PT100)	10
35.	Temperature Controller (For Thermo Couple)	10
36.	Proximity Switches-(Capacitive-PNP Four Wire)	20
37.	Proximity Switches-(Inductive-PNP Four Wire)	20
38.	Proximity Switches-(Retro Reflective-PNP Three Wire)	20
39.	Proximity Switches-(Capacitive-NPN Four Wire)	20
40.	Proximity Switches-(Inductive-NPN Four Wire)	20
41.	Proximity Switches-(Retro Reflective-NPN Three Wire)	20
42.	PLC (Siemens S7-1200)	2
43.	PLC (Mitsubishi FX3U)	2
44.	PLC (Fatek FBS32MR)	2
45.	PLC (ABB AC-500)	2
46.	PLC (Delta ES2-R)	2
47.	10" HMI Axis Module (Syntec HC Series)	2
48.	Power Supply 24VDC, 10 Amp	20
49.	Portable Wiring Trainer	20

Sr. #	Description	Quantity
50.	Power Cable Single Core (1mm, 1.5 mm, 4mm) (Red, Black, Yellow, Green)	5 coils of each color
51.	Computer System (Core i7)	20
52.	Earth leakage Breaker	5
53.	Over/Under/Phase Failure Load Relays	20
54.	Power Analyzer	2
55.	Terminal Blocks	500
56.	Cable lugs (U , I & O Type) 1mm, 1.5 mm, 4mm	20 Packet Each
57.	Cable Tie (Small & Medium)	200 Packet Each
58.	Shrinkable Tube(2mm, 4mm, 6mm)	12 Meter Each
59.	Label (Tags) (Alphabetically & Number wise)	25 Packet
60.	Hammering Drill Machine	2
61.	Air Blower	1
62.	Slotted Trunking 25mm X 45mm-(2Meter Length)	10
63.	PPEs (Safety Goggles, Safety Gloves, Ear Plugs, Anti-Static Gloves, Safety Helmet, Safety Shoes, Apron, Mask, Respirator)	20 Each
64.	First Aid Box	2
65.	First Aid Kit	1
66.	Fire extinguisher	2
67.	Allen key set (mm size)	20
68.	Allen key set (inch size)	20
69.	Sockets set	2
70.	Manual of available local green resources, products, and services	20
71.	Manual of indenting/Ordering procedures	20
72.	Manual of Procedures for thermal remediation	20
73.	Manual of Procedures for biological remediation	20
74.	Manual of Procedures for chemical remediation	20
75.	Manual of Procedures for containment remediation	20
76.	Manual of Procedures for landscaping	20

Sr. #	Description	Quantity
77.	Manual of Procedures for tree-planting	20
78.	Manual of Procedures for habitat restoration	20
79.	Manual of techniques of energy conservation	20
80.	Manual of local Standards of environmental quality.	20
81.	Manual of Pollution reduction and prevention methods/ solutions.	20
82.	Manual of air emissions and control technologies.	20
83.	Manual of water conservation fixtures	20
84.	Manual of Methods of Erosion control	20
85.	Manual of techniques of energy conservation	20
86.	Available material on Processes used to Recycle plastics with a low energy input.	
87.	Available material on Processes used to Produce steel from ferrous metal	
88.	Available material on Methods of Transformation of biodegradable waste into compost and into biogas	
89.	Operation manual of biodigester	20
90.		
91.		
92.		
93.		