Manpower Planning and Development (Electrical Industry) (Amendment) Notice, 2021 (No. 16)

IT is hereby notified that the Minister of Higher and Tertiary Education, Innovation, Science and Technology Development has, in terms of section 32 of the Manpower Planning and Development Act [*Chapter 28:02*], made the following notice:—

1. This notice may be cited as the Manpower Planning and Development (Electrical Industry) (Amendment) Notice, 2021 (No. 16).

2. The First Schedule of the Manpower Planning and Development (Electrical Industry) Notice, 1980, published in Statutory Instrument 745 of 1980, is amended by the insertion of—

"Instrumentation and Control Technician"

3. The Second Schedule is amended by the insertion of the following—

NATIONAL DIPLOMA IN ELECTRONIC ENGINEERING: INSTRUMENTATION AND CONTROL SYSTEM

ZIMBABWE	**MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE**		**CODE**
INDUSTRY: **Electrical Engineering**	**TRADE/OCCUPATION:** **Instrumentation & Control Technician**		**CLASS/LEVEL:** **National Diploma**
DUTY A: Install Equipment			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACEESSENTIAL SKILLS**
A. 1 **Assess the Equipment**	➢ Visually inspect the equipment ➢ Check availability of components ➢ Check if specifications adheres to standard ➢ Check availability of interface software and operation manual ➢ Select test equipment ➢ Measure the dimensions of the equipment ➢ Prepare assessment report	• Equipment is checked for wear and tear • Corresponding components are labelled • Test meters are used • Conversion tables are used • test equipment is selected according to dimensions to be checked • Manuals are downloaded • Functionality of interface software is ascertained • Assessment certificate is filed.	• Interpretation of wiring diagram • Use of hand tools • Use of measuring tools • Knowledge of materials • Knowledge of colour codes • Use of marking tools • Use of electrical machinery • Ability to perform component testing • Component identification purpose and operating principle • Knowledge of loop diagnostic methods • Programme design and writing • Use of various intelligent devices	Measuring skills Calculations Results interpretation Reading instructions, specifications, manuals, data sheets and charts Interpretation of diagrams Computer literacy Scheduling of work

TASK	STEPS	PROFICIENCY INDICATORS		
A. 2 **Prepare Work Area**	➢ Identify work site ➢ Select tools, equipment and materials ➢ Clean the work area ➢ Mark-out the installation area ➢ Run cables and impulse lines ➢ Prepare Safety documents ➢ Prepare brackets and holders	• Work area is barricaded • Switch gear is turned off and locked • Equipment location is marked • Unwanted equipment is (re)moved? • Power cables, signal cables and impulse lines are in place • Brackets and holders are fabricated • Caution signs are in place • Safety documents are printed and displayed • Sources nd signal cables are labelled • Installation area is painted with proper colour coding • Appropriate tools and equipment are selected • Worn out structures are reconstructed • Recommended cleaning solvents are used • Cable selection chart is employed		

TASK	STEPS	PROFICIENCY INDICATORS		
A. 3 **Configure and programme equipment**	➢ Identify equipment software ➢ Select programming language to use ➢ Identify computer hardware ➢ Select interface module ➢ Write down the programme ➢ Convert programme to machine language ➢ Debug programme for equipment ➢ Upload programme to equipment ➢ Run the programme	• Equipment version charts are used • Programming language is identified and noted • Interface selection is done • System with sufficient selecting power is selected • Programming software is installed • Function block diagram is designed • Equipment programme is filed • Programme is compiled to machine language • Debugging report is produced • Equipment indicators indicating programme is loaded • Equipment parameters have changed • Programme simulation is carried out • Read indicator on equipment is turned on		
A. 4 **Assemble Equipment**	➢ Select appropriate tools ➢ Position equipment to its corresponding markings ➢ Fix equipment to brackets and holders ➢ Join corresponding parts ➢ Secure equipment with appropriate joining tools ➢ Check if all connections are as written in the manual ➢ Fix cables according to correct colours and sizes.	• Appropriate tools and equipment are selected • Equipment is fixed to brackets and holders • Equipment is properly positioned to its corresponding markings • All cables are connected • All drawings are secured • All cables are well-labelled • Correct colour and cable sizes are documented • Torque wrench is used to test the strength of mountings		

TASK	STEPS	PROFICIENCY INDICATORS		
A.5 Commission Equipment	➢ Check if all cables are well-terminated ➢ Test for short and open circuits ➢ Cancel out safety document ➢ Switch on power ➢ Check availability of inputs and outputs ➢ Verify functionality of interlocks ➢ Conduct test-run ➢ Rectify shortcomings ➢ Prepare commissioning report	• Lugs of correct sizes are used • Test meter is used to test for short and open circuits • Isolation key is removed • Breaker is turned on • Mechanical and electrical soundness is ensured • Input and output signals are verified • Equipment is operated according to set standards • Identified shortcomings are rectified • Analysed data is tabulated • Produced signals are measured • Commissioning reports are filed.		

TOOLS AND EQUIPMENT NECESSARY TO COMPLETE THIS DUTY:

Insulated screw driver	Cable stripper	Pop rivet guns
Side cutters set	Drilling machine	Paint brush
Cable knives	Crimping tool	Soldering station
Combination spanners	Test meter	Adjustable spanner set
Allen keys	Hacksaw	Pipe wrench
Pipe cutter	Printer	Telephone
Computer	Intelligent device interfaces	

MATERIALS

Computer software	DIN rails	Paint
Stationery	Software discs	Permanent markers
Insulated Lugs	Soldering wire	Compression glands
Insulation tape	Cables	
Slotted trunking	Bolts and nuts	
Rivets	Pipes	

HEALTH, SAFETY AND ENVIRONMENTAL ISSUES RELATED TO THIS DUTY:

Housekeeping
First Aid kit
Environmental regulations
Personal Protective Equipment
Workshop safety and health regulations
Waste separation
Plant isolation

SPECIFIC WORKER TRAITS REQUIRED IN COMPLETING THIS DUTY:

Team worker
Sober-minded
Punctual
Focussed
Able to communicate
Creative
Target oriented

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE		CODE
INDUSTRY: Electrical Engineering	**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY B: Calibrate Equipment			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**

TASK	STEPS	PROFICIENCY INDICATORS	RELATEDKNOWLEDGE	WORK-PLACEESSENTIAL SKILLS
B. 1 **Identify equipment that needs calibration**	➢ Look at register of instruments to be calibrated ➢ Check equipment behaviour in the plant ➢ Check process outputs ➢ Measure process signals from an instrument ➢ Respond to operator request for instrument calibration	• Calibration register is updated • Conversion tables are used • Condition monitoring Job Card is compiled • Process calibrators are used • Operator report book is used • All process parameters are recorded	• Knowledge of approved standards • Knowledge of unit conversions • Measurement using test meter • Knowledge of Electronic circuits • Use of hand tools • Knowledge of colour codes • Selecting correct calibrators • Trouble shooting • Document preparation • Use of cleaning solvents • Instrument principle of operation	Reading manuals Interpreting wiring diagrams Calculations Measuring skills Interpretation of results Computer literacy

ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE

	CODE

INDUSTRY: Electrical Engineering	**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY B: Calibrate Equipment			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**
B. 2 Prepare work bench	➢ Remove equipment from the plant ➢ Clean the workbench ➢ Select appropriate tools ➢ Prepare standards to be used ➢ Set up the equipment	• Appropriate cleaning solvents are used • Unnecessary equipment is removed from the workbench • Equipment is on the table • All necessary tools and standards are on the table • Standards are fitted to the equipment • Equipment is ready for calibration • Conversion tables are on the workbench	

WORK - PLACE ESSENTIAL SKILLS

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE		CODE
INDUSTRY: Electrical Engineering	**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY B: Calibrate Equipment			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**

TASK	STEPS	PROFICIENCY INDICATORS	RELATEDKNOWLEDGE	WORK-PLACEESSENTIAL SKILLS
B. 3 **Compare instrument output against standard**	➢ Turn on power to the equipment ➢ Put a known standard to the input of the equipment ➢ Monitor the behaviour of the equipment against standard ➢ Maintain ambient standards	• The equipment is powered • Input signal is generated • Equipment behaviour is recorded • Indicating equipment is used • Deviations are noted		

ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE

		CODE

INDUSTRY: **Electrical Engineering**	**TRADE/OCCUPATION:** **Instrumentation & Control Technician**	**CLASS/LEVEL:** **National Diploma**
DUTY B: Calibrate Equipment		
Pre-requisites: National Certificate	**Approval Date:**	**Review Date:18 - 20 March 2014**

TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACEESSENTIAL SKILLS**
B.4 Perform adjustments	➢ Check for zero error ➢ Adjust the zero of the instrument ➢ Check for the range of the instrument ➢ Adjust the range of the instrument	• The zero error is noted • The zero screw is adjusted • The new zero value is recorded • The range error is noted • The range screw is adjusted • The new range is recorded		

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE			CODE
INDUSTRY: Electrical Engineering		**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY B: Calibrate Equipment				
Pre-requisites: National Certificate		**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACEESSENTIAL SKILLS**
B. 5 **Generate calibration certificates and stickers**	➢ Compile calibration sheets ➢ Update the calibration register ➢ Issue out calibration certificates ➢ Fill in calibration stickers	• Calibration sheet is compiled • Calibration register is updated • Calibration certificate is written • Calibration stickers are put on the equipment		

TOOLS AND EQUIPMENT NECESSARY TO COMPLETE THIS DUTY:

Computer	Cable strippers	Standard certified test equipment
Precision screw driver	Intelligent device interface	Signal simulator
Spanner set	Screw drivers	Loop calibrator

Side cutters	Test meter	Hart communicator
Cable knife	Soldering station	Manuals

MATERIALS

Insulation tape
Insulation lugs
Software disks

HEALTH, SAFETY AND ENVIRONMENTAL ISSUES RELATED TO THIS DUTY:

First Aid Kit
Personal Protective Equipment
Housekeeping
Environmental regulations
Proper waste disposal methods

SPECIFIC WORKER TRAITS REQUIRED TO COMPLETE THIS DUTY:

Team-worker
Target-oriented
Focussed
Communicator

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE		CODE
INDUSTRY: **Electrical Engineering**	**TRADE/OCCUPATION:** **Instrumentation & Control Technician**		**CLASS/LEVEL:** **National Diploma**
DUTY C: Perform PLC Programming			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**

TASK	STEPS	PROFICIENCY INDICATORS	RELATEDKNOWLEDGE	WORK-PLACE ESSENTIAL SKILLS
C.1 **Establish instrument maintenance requirements**	➢ Monitor instrument performance ➢ Identify manufacturer's maintenance recommendations ➢ Evaluate instrument process environment ➢ Assess the historical data of similar instruments from records	• Manufacturer's maintenance manuals are used • Manufacturers experts are consulted • Periodic instrument condition checks are performed • Historical instrument performance charts are analysed • Environmental reports are generated • Process operators are consulted	• Interpretation of wiring diagram • Use of hand tools • Use of measuring tools • Knowledge of materials • Knowledge of colour codes • Use of marking tools • Use of electrical machinery • Ability to perform component testing • Component identification purpose and operating principle • Knowledge of loop diagnostic methods • Programme design and writing • Use of various intelligent devices • Knowledge of process and instruments • Ability to create back ups • Programme design and writing	Measuring skills Calculations Results interpretation Reading instructions, specifications, manuals, data sheets and charts Interpretation of diagrams Computer literacy Scheduling of work

ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE

CODE

INDUSTRY: Electrical Engineering	**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY C: Perform PLC Programming			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
C. 2 Prepare maintenance schedule	➢ Tabulate gathered data ➢ Analyse the tabulated data ➢ Create performance curve from statistics ➢ Construct periods of maintenance required ➢ Prepare a maintenance chart	• Instrument performance data is gathered • Data curves are compared to the standard • Data conversions and performance curves are created • Maintenance schedule is compiled • Performance calendar is generated • Maintenance charts are prepared • Previous maintenance schedules are reviewed		

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE			CODE
INDUSTRY: Electrical Engineering		**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY C: Perform PLC Programming				
Pre-requisites: National Certificate		**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
C.3 Formulate maintenance procedures	• List maintenance methods • Compare and contrast the methods • Select most applicable maintenance method • Compile a systematic way of maintenance	• Instrument's technical documents are used • Various methods of maintenance are examined • Advantages and disadvantages of methods are noted • Most appropriate methods are combined • A draft maintenance procedure is prepared • Draft maintenance procedure is refined to the final maintenance procedure • Maintenance procedure is filed		

ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE

CODE

INDUSTRY: Electrical Engineering	**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY C: Perform PLC Programming			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
C.4 Overhaul field instruments	• Select appropriate equipment, tools and materials • Assess the current state of the instrument • Mount instrument on to a bench • Mark out matching components • Dismantle instrument according to procedure • Check for wear and tear • Replace worn-out parts • Lubricate moving parts • Assemble instrument according to maintenance procedure	• Appropriate tools and materials are selected and used • Condition of instrument is noted • Standard mounting system is employed • Appropriate markings are made • Correct dismantling sequence is applied • All accessories are checked for wear and tear • Manufacturer's recommended parts are used for replacement • Ideal lubricating agents are used		

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE			CODE
INDUSTRY: Electrical Engineering		**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY C: Perform PLC Programming				
Pre-requisites: National Certificate		**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
	• Check the instrument for proper operation	• Assembly diagrams are used • Assembled instrument is set up in plant position • Process signals are applied to the instrument • Plant conditions are simulated • Test results are noted		
C.5 Prepare a maintenance report	• Gather maintenance data • Compile data to produce systematic sequence • Indicate maintenance procedures used and condition in which they are performed • Outline test results obtained in tests done	• Systematic data layout is prepared • Name of maintenance procedure is documented • Maintenance procedure used is attached		

ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE

	CODE

INDUSTRY: **Electrical Engineering**		**TRADE/OCCUPATION:** **Instrumentation & Control Technician**		**CLASS/LEVEL:** **National Diploma**
DUTY C: Perform PLC Programming				
Pre-requisites: National Certificate		**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
	• Identify responsible personnel for maintenance • Indicate next maintenance date	• Test results are presented • Name and rank of responsible personnel is presented • Next calibration date is indicated • Pre and post maintenance behaviour is noted • Spare stocks recommendations are noted		

TOOLS AND EQUIPMENT NECESSARY TO COMPLETE THIS DUTY:

Insulated screw driver
Side cutters set
Cable knives
Combination spanners
Allen keys
Cable stripper
Drilling machine
Crimping tool
Test meter
Hacksaw
Pop rivet guns
Paint brush
Soldering station
Adjustable spanner set
Pipe wrench
Pipe cutter
Computer
Printer
Intelligent device interfaces
Telephone

MATERIALS

Computer software
Insulation tape
Slotted trunking
Rivets
Soldering wire
Stationery
Cables
Bolts and nuts
Pipes
Paint
Insulated Lugs
Permanent markers
Compression glands
Cleaning solvents

HEALTH, SAFETY AND ENVIRONMENTAL ISSUES RELATED TO THIS DUTY:

Housekeeping
First Aid kit
Environmental regulations
Personal Protective Equipment
Workshop safety and health regulations
Waste separation
Plant isolation

SPECIFIC WORKER TRAITS REQUIRED IN COMPLETING THIS DUTY:

Team worker
Sober-minded
Punctual
Focussed
Able to communicate
Creative
Target oriented

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE			CODE
INDUSTRY: Electrical Engineering		**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY D: Perform PLC Programming				
Pre-requisites: National Certificate		**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
D. 1 Develop training programmes	➢ Identify subordinates training needs ➢ Interview subordinates on work related issues ➢ Interpret up-to-date training models ➢ Formulate a training structure	• Interview questions are formulated • Subordinates' strengths and weaknesses are noted • Subordinates weak areas are analysed • A training structure is drafted • Training model results are documented	• Supervision • Delegation of work • Ability to resolve disputes • Knowledge of social traits • Knowledge of code of conduct • Knowledge of Labour Legislation • Vast knowledge of Instrumentation and Control	• Literacy • Computer literacy • Scheduling of work • Interpretation of documents • Counselling • Disciplining • Training skills
D.2 Monitor subordinates' performance	➢ Delegate duties to subordinates ➢ Compare subordinates' performance against expected performance ➢ Tabulate time taken to complete a task ➢ Compile a performance report	• Job cards are issued to subordinates • Shortcomings are noted • Skills of subordinates are classified • A performance report is compiled		

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE			CODE
INDUSTRY: Electrical Engineering		**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY D: Perform PLC Programming				
Pre-requisites: National Certificate		**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
D. 3 Handle subordinates disputes and grievances	➢ Evaluate the cause of a dispute ➢ Schedule a meeting with subordinates to hear their grievances ➢ Solve subordinates grievances ➢ Issue out warnings to misbehaving subordinates ➢ Solve differences between subordinates	• The cause of a dispute is evaluated • Disputes reports are written • Grievances are referred to relevant authorities • Minutes are recorded • Code of conduct is read • Warning reports are filed		
D. 4 Appraise subordinates	➢ Fill in the appraisal form ➢ Assess subordinates qualifications ➢ Assess subordinates skills and abilities	• Performance report is written • Subordinates qualifications are documented • Subordinates skills and abilities are analysed • A recommendation report is written		

ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE

CODE

INDUSTRY: **Electrical Engineering**	**TRADE/OCCUPATION:** **Instrumentation & Control Technician**		**CLASS/LEVEL:** **National Diploma**
DUTY D: Perform PLC Programming			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
D.5 Manage safety and health issues	➢ Conduct routine safety talks ➢ Provide subordinates with enough protective clothing ➢ Issue out work permits ➢ Train subordinates on safe use of equipment	• Safety meeting minutes are written • Protective clothing is issued out to subordinates • Work permits are signed • Safety training is conducted • Work permits are displayed at the work place • Subordinates are monitored for compliance with health and safety requirements		

TOOLS AND EQUIPMENT NECESSARY TO COMPLETE THIS DUTY:

Computer
Printer
Manuals
Files
Code of conduct

MATERIALS

Stationery

HEALTH, SAFETY AND ENVIRONMENTAL ISSUES RELATED TO THIS DUTY:

Housekeeping
First Aid kit
Environmental Regulations
Personal Protective Equipment
Workshop safety and health regulations
Waste separation
Plant isolation

SPECIFIC WORKER TRAITS REQUIRED TO COMPLETE THIS DUTY:

Communication
Sober-minded
Leadership
Target-oriented

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE			CODE
INDUSTRY: Electrical Engineering		**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY E: Perform PLC Programming				
Pre-requisites: National Certificate		**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
E1 **Carry out plant checks**	➢ Clean process instruments ➢ Observe physical condition of instruments ➢ Check input and output	• Instruments are free from dust and dirt • Present state and condition of instrument are recorded • Good state of interface is ensured • Unusual conditions are noted down • Detailed plant check report is filed • Process operators are consulted to give their views interfaces • Write down a plant check report	• Interpretation of wiring diagram • Use of hand tools • Use of measuring tools • Knowledge of materials • Knowledge of colour codes • Use of marking tools • Use of electrical machinery • Ability to perform component testing • Component identification purpose and operating principle • Knowledge of loop diagnostic methods • Programme design and writing • Use of various intelligent devices • Knowledge of process and instruments • Ability to create back ups	Measuring skills Calculations Results interpretation Reading instructions, pecifications, manuals, data sheets and charts Interpretation of diagrams Computer literacy Scheduling of work

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE			CODE
INDUSTRY: Electrical Engineering		**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY E: Perform PLC Programming				
Pre-requisites: National Certificate		**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
E. 2 Troubleshoot faulty instruments	➢ Select appropriate tools and equipment ➢ Check history of similar faults on records ➢ Inspect individual components of instruments ➢ Review technical manuals to find fault codes	• Test meter is used • Error code charts are used • Component inspection document is filled • Respective technical manuals are employed to find the source of the fault • Manufacturer's support team is contacted • Worn parts are identified		

ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE

	CODE

INDUSTRY: **Electrical Engineering**	**TRADE/OCCUPATION:** **Instrumentation & Control Technician**		**CLASS/LEVEL:** **National Diploma**
DUTY E: Perform PLC Programming			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
E. 3 Rectify faults found	➢ Select required tools and materials ➢ Take faulty instrument to work bench ➢ Dismantle faulty instrument according to procedure ➢ Replace old and damaged components ➢ Lubricate instrument ➢ Assemble instrument	Appropriate tools and equipment are selected and used Required lubrication agents are used Correct material and parts are sourced Faulty instrument is taken to the workshop Defective parts are replaced Instrument is overhauled		

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE		CODE
INDUSTRY: Electrical Engineering	**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY E: Perform PLC Programming			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
E.4 Test instrument for functionality	➢ Mount instrument on test bench ➢ Check if outputs adhere to standards ➢ Perform reliability test ➢ Prepare test report ➢ Prepare certificate tags	• Instrument is brought into the workshop and mounted on test bench • Input-output standard charts are used • Calculations are done for reliability checks • Process simulation is carried out • Test reports are filed • Tags are attached to repaired instruments		

ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE

			CODE
INDUSTRY: **Electrical Engineering**	**TRADE/OCCUPATION:** **Instrumentation & Control Technician**		**CLASS/LEVEL:** **National Diploma**
DUTY E: Perform PLC Programming			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:18 - 20 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATEDKNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
E.5 Return instrument to service	➢ Acquire fittings which fit the process ➢ Select proper housing ➢ Insert proper signal terminals ➢ Assemble instrument into process ➢ Verify instrument output has not deviated	• Fittings of the correct size are inserted • Housing of the correct ingress-protection is selected • The proper colour code is used • Input-output terminals of correct size are constructed • Adequate fasteners are used • Output signals are checked		

TOOLS AND EQUIPMENT NECESSARY TO COMPLETE THIS DUTY:

Insulated screw driver	Side cutters set	Cable knives
Combination spanners	Hacksaw	Pipe cutter
Allen keys	Pop rivet guns	Computer
Cable stripper	Paint brush	Printer
Drilling machine	Soldering station	Intelligent device interfaces
Crimping tool	Adjustable spanner set	Telephone
Test meter	Pipe wrench	

MATERIALS

Computer software	Rivets	Paint
Stationery	Soldering wire	Permanent markers
Insulated Lugs	Cables	Compression glands
Insulation tape	Bolts and nuts	Cleaning solvents
Slotted trunking	Pipes	

HEALTH, SAFETY AND ENVIRONMENTAL ISSUES RELATED TO THIS DUTY:

Housekeeping	Personal Protective Equipment	Plant isolation
First Aid kit	Workshop safety and health regulations	
Environmental regulations	Waste separation	

SPECIFIC WORKER TRAITS REQUIRED IN COMPLETING THIS DUTY:

Team worker
Sober-minded
Punctual
Focussed
Able to communicate
Creative
Target oriented

ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE

CODE

INDUSTRY: **Electrical Engineering**		**TRADE/OCCUPATION:** **Instrumentation & Control Technician**	**CLASS/LEVEL:** **National Diploma**
DUTY F: Perform PLC Programming			
Pre-requisites: National Certificate		**Approval Date:**	**Review Date:6 - 7 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATED KNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
F. 1 Gather Information	➢ Collect wiring diagrams from different working areas ➢ Enter all job cards into the system ➢ Combine all safety documents ➢ Write project reports ➢ Collect appropriate/relevant manuals	• All wiring diagrams are put in the same file • All job cards are entered in the system • Project reports are written • All necessary manuals are available • Manuals are downloaded • Manuals are printed	• Computer literacy • Interpretation of tables • Knowledge of document archiving • Electronic circuit design • Document indexing	• Interpretation of results • Scheduling of work • Interpretation of codes

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE			CODE
INDUSTRY: Electrical Engineering		**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY F: Perform PLC Programming				
Pre-requisites: National Certificate		**Approval Date:**		**Review Date:6 - 7 March 2014**
TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATED KNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
F.2 Prepare documents	➢ Generate work procedures ➢ Update calibration register ➢ Create wiring diagrams for the new projects ➢ Compile maintenance report ➢ Develop calibration procedures	• Work procedures are documented • All documents are indexed • Calibration register is updated • Maintenance reports are printed • Calibration procedures are written		

ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE

CODE

INDUSTRY: **Electrical Engineering**	**TRADE/OCCUPATION:** **Instrumentation & Control Technician**	**CLASS/LEVEL:** **National Diploma**
DUTY F: Perform PLC Programming		
Pre-requisites: National Certificate	**Approval Date:**	**Review Date:6 - 7 March 2014**

TASK	**STEPS**	**PROFICIENCY INDICATORS**	**RELATED KNOWLEDGE**	**WORK-PLACE ESSENTIAL SKILLS**
F. 3 Archive Documents	➢ Classify documents according to sections of the plant ➢ Label all files ➢ Create a folder for the calibration register ➢ Create and assign document codes ➢ Create an archive register	• Files are clearly and systematically labelled • Documents are grouped according to their type • Documents are shelved in alpha-numerical order • Sequential codes are assigned to related documents • A register with all documents in archives is created • A searchsoftware is used to easily find documents in the archives.		

ZIMBABWE	MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT SKILLS PROFICIENCY SCHEDULE		CODE
INDUSTRY: Electrical Engineering	**TRADE/OCCUPATION:** Instrumentation & Control Technician		**CLASS/LEVEL:** National Diploma
DUTY F: Perform PLC Programming			
Pre-requisites: National Certificate	**Approval Date:**		**Review Date:6 - 7 March 2014**

TASK	STEPS	PROFICIENCY INDICATORS	RELATED KNOWLEDGE	WORK-PLACE ESSENTIAL SKILLS
F.4 Review and revise documents	➢ Identify documents that need revision ➢ Acquire relevant information for document revision ➢ Update documents ➢ Certify the revisions	• Relevant information for revision is acquired • Out-dated documents are collected • Documents are updated • Standard upgrades and changes are noted		

TOOLS AND EQUIPMENT NECESSARY TO COMPLETE THIS DUTY:

Computer
Printer
Drawing board

MATERIALS

Stationery
Blank disks

HEALTH, SAFETY AND ENVIRONMENTAL ISSUES RELATED TO THIS DUTY:

Personal protective equipment
Housekeeping
Fire protection system

SPECIFIC WORKER TRAITS REQUIRED TO COMPLETE THIS DUTY:

Sober minded
Team worker
Good communication skills
Target oriented