Module Resource Manual

(Induction)

Workplace Experience Evidence Gathering

for

Certificate III Electrotechnology System Electrician (UTE 99 3 11)

Learner / trainee Workbook

First Edition

TRAINING STANDARDS

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- ***Energy- Utilities:***
  - Gas Supply Transmission and Distribution;
  - Electricity Supply Transmission and Distribution and,
  - Electricity Supply Generation

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Contents

Resources and References

The following textbooks are recommended for this module:

References:

- *National Electrotechnology Training Package UTE99 for the Electrotechnology Industry version 3 or updated/revised version*.*
- Workplace Assessor Manual Lift Industry - Lift-Skills Australia. September 1999.
- *Certificate III Electrotechnology Systems Electrician User Guide/Profiling**
- *Competency development schedule and Certificate III Electrotechnology Systems Electrician flow chart**
- *Supervision Policy**
- *Electrotechnology training model teacher/trainer**

* (*Available from EE-Oz Training Standards website:* http://www.ee-oz.com.au/)

You will need the following items to complete this module:

- Pens, pencils, etc.
- Calculator
- Writing paper.

Information for Teachers

This module resource manual contains references, notes and learner / trainee exercises. It is intended to assist in delivery of the module and is an example of the depth and breadth of the learning expected.

The topics are arranged in the following learning sequence.

1. **Electrotechnology Systems Electrician Qualification Structure**
2. **Work Place Experience Gathering**
3. **Log Books**
4. **Electronic Profiling**
5. **Work Place Experience Evidence Monitoring and Reporting**
6. **Portfolio**
7. **Workplace Assessment**

It is recognised that this is not the only sequence in which the material could be learnt. The suggested program of delivery would be that these topics be better presented later in the Stage 1 program when learner / trainees would have more knowledge of the types of wiring systems, apparatus and equipment used in the work environment.

Note: **1** An apprentice, student or candidate is referred to as a learner / trainee in this document. They all mean the same.

2. A learner / trainee undertaking the Certificate III in Electrotechnology Systems Electrician is to be an apprentice so contracted by an employer. This is an electrical regulatory requirement in all states and territories and any exceptions that may apply will be advised by respective electrical regulators.

3. Overseas tradespersons requirements, for those seeking recognition through recognition of prior learning (RPL) are not included as part of this document.

1. Electrotechnology Systems Electrician Qualification Structure

MODULE PURPOSE – (Induction Module)

The purpose of this topic is to provide the learner / trainee with an understanding of the structure of the Certificate III Electrotechnology Systems Electrician qualification.

Objectives - To Achieve The Purpose Of This Topic:

At the end of this topic the learner / trainee will be able to:

- Define a unit of competency.
- State the structure of the Certificate III Electrotechnology Systems Electrician qualification.
- List the underpinning modules required for the qualification and the flow chart.
- State the purpose and the contents of the work performance record modules.
- State the purpose and contents of the Electrical Systems Safety module.

Contents

1.1 Introduction

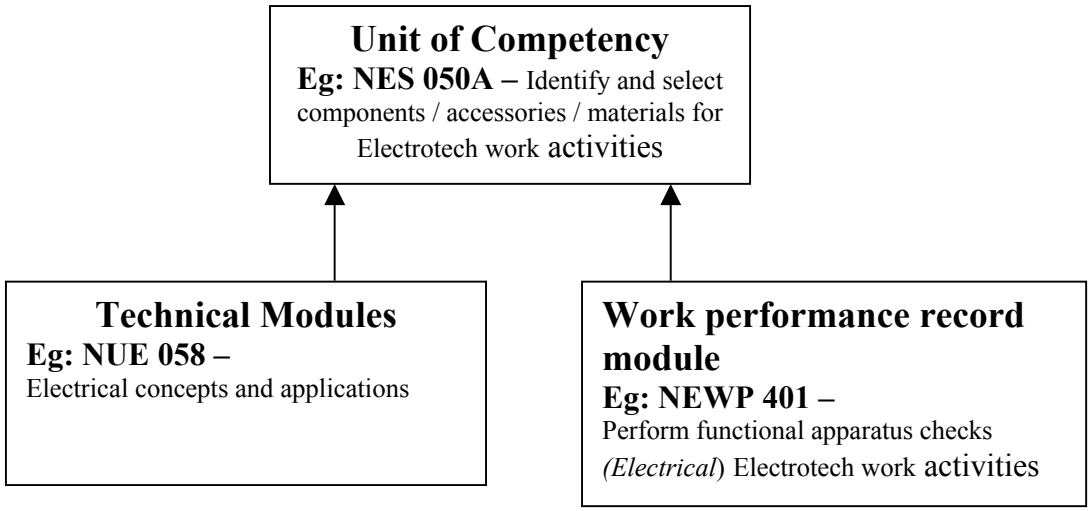
The Electrotechnology Systems Electrician qualification will provide people who are trained to install, maintain, commission, test and fault find electrical components, wiring systems, electrical equipment and systems (such as lights, motors and controls, heaters, stoves, hot water systems, control systems, distribution systems, etc)

This qualification also provides licensed outcomes, eligibility for Electricians undertaking work on fixed wired installations at low voltages (50 volts ac to 1000 volts ac). The qualification is the same in all Australian states and territories and is also recognised by the New Zealand licensing authorities.

1.2 Unit of Competency

The qualification is made up of units of competency. The unit of competency describes the type of work or skill functions that a learner / trainee needs to achieve for the qualification.

The unit of competency is made up of two components, namely underpinning knowledge and skills, which is gained in technical modules delivered at a Recognised Training Organisation RTO (off-job) and work experience gained with the employer (on-job).



1.3 Qualification Structure and Completion

The qualification is made up of selected **units of competency** and a **selected specialisation**. The units of competency consists of:

- Core units of competency (8 must be completed),
- Specialisation (1 must be selected)
- Elective unit of competency (1 must be completed) and, if needed,
- One or more optional units of competency

1.4 Work Performance Reports

Work performance record modules provide the specification of the "evidence" of work experience required for the unit of competency to be achieved. Evidence is formal information gathered or received from the learner / trainee and submitted for the purpose of assessing the learner's / trainer's performance.

The specifications can be divided into the following areas:

- Number of times each element needs to be carried out - normally twice
- The level of supervision - normally under broad supervision
- The range of variables – i.e. range of equipment, cables, tests etc
- The method of collecting the evidence from the workplace.

Example of work performance record: UTE NES105g A Install and terminate wiring systems - *cable/wiring support and protection.*

Core Unit of Competency

The core unit describes the technical work or skill functions that a learner / trainee needs to achieve in this qualification**.**

The core units for the CIII Electrotechnology Systems Electrician qualification are listed below:

UTE NES009 A	Participate in the training of others
UTE NES105g A	Install and terminate wiring systems - *cabling /wiring support and protection*
UTE NES105j A	Install and terminate wiring systems - *power and control - low voltage*
UTE NES106b A	Install electrical/electronic apparatus - *electrical*
UTE NES206b A	Maintain and repair apparatus and associated circuits - *electrical*
UTE NES301b A	Undertake commissioning procedures of apparatus and associated circuits - *electrical*
UTE NES402b A	Test apparatus and circuits - *electrical*
UTE NES501b A	Diagnose and rectify faults in apparatus and associated circuit - *electrical*

Specialisation

The specialisation relates to the work environment in which the core technical requirements apply**.**

Ten specialisations are available in the CIII Electrotechnology Systems Electrician qualification; one must be selected for completion from the list below:

1. *Control*:

Installation, maintenance and repair of industrial control systems and equipment that involve pneumatic; mechanical, electrical/electronic instrumentation systems and equipment. Location - Industrial and commercial situations in all types of industries.

2. *Energy Supply*:

The installation and maintenance of apparatus and equipment belonging to electricity distributors ranging from equipment in consumers' switchboards to substations and control centres. Location - Industrial workshops, substations, switch yards and premises pertaining to the electrical distributors.

3. *Fire Protection*:

Installation off fire protection alarm wiring in a variety of premises including residential, commercial and industrial settings and the maintenance of fire detection equipment, apparatus and devices contained therein. Location - Residential, commercial and industrial situations.

4. *Installation and Servicing*:

General installation of wiring in a variety of premises including residential, commercial and industrial settings and the maintenance of equipment, apparatus and devices contained therein. Location - Residential, commercial and industrial situations.

5. *Maritime Installation*:

The installation and maintenance of equipment and apparatus on marine vessels and offshore drilling platforms. Location - Ships, submersibles, shipyards and offshore drilling platforms.

6. *Mining*:

The installation and maintenance of equipment and apparatus in mines and collieries and associated land drilling and mining operations. Location - Can include open cut and underground mines and workshops specialising in mining equipment.

7. *Plant Servicing*:

The installation and maintenance of equipment and apparatus associated with mobile and stationary plant. Location - Commercial and industrial environments.

8. *Process*:

Installation, maintenance and repair of process control systems and equipment that involve pneumatic, hydraulic, mechanical and electrical/electronic instrumentation systems and equipment. Location - Process situations for variety industries.

9. *Security*:

Installation, commissioning, maintenance and repair of equipment used to maintain the security of commercial and domestic premises. Location - residential, commercial and industrial situations.

10. *Signalling (Rail)*:

The installation and maintenance of signalling systems used for the control of public transport, especially trains, automobile traffic and the like. Location - manufacturing workshops, industrial base workshops and special purpose motor vehicles.

Elective Units of Competency

The elective unit describes the supporting organisational quality assurance arrangements that a learner / trainee needs to achieve in this qualification**.**

One elective unit must be completed from the listed units below for the CIII Electrotechnology Systems Electrician. The units are:

UTE NES002 A	Attend to breakdown
UTE NES005 A	Co-ordinate materials
UTE NES007 A	Supply projects
UTE NES008 A	Provide technical leadership in the workplace

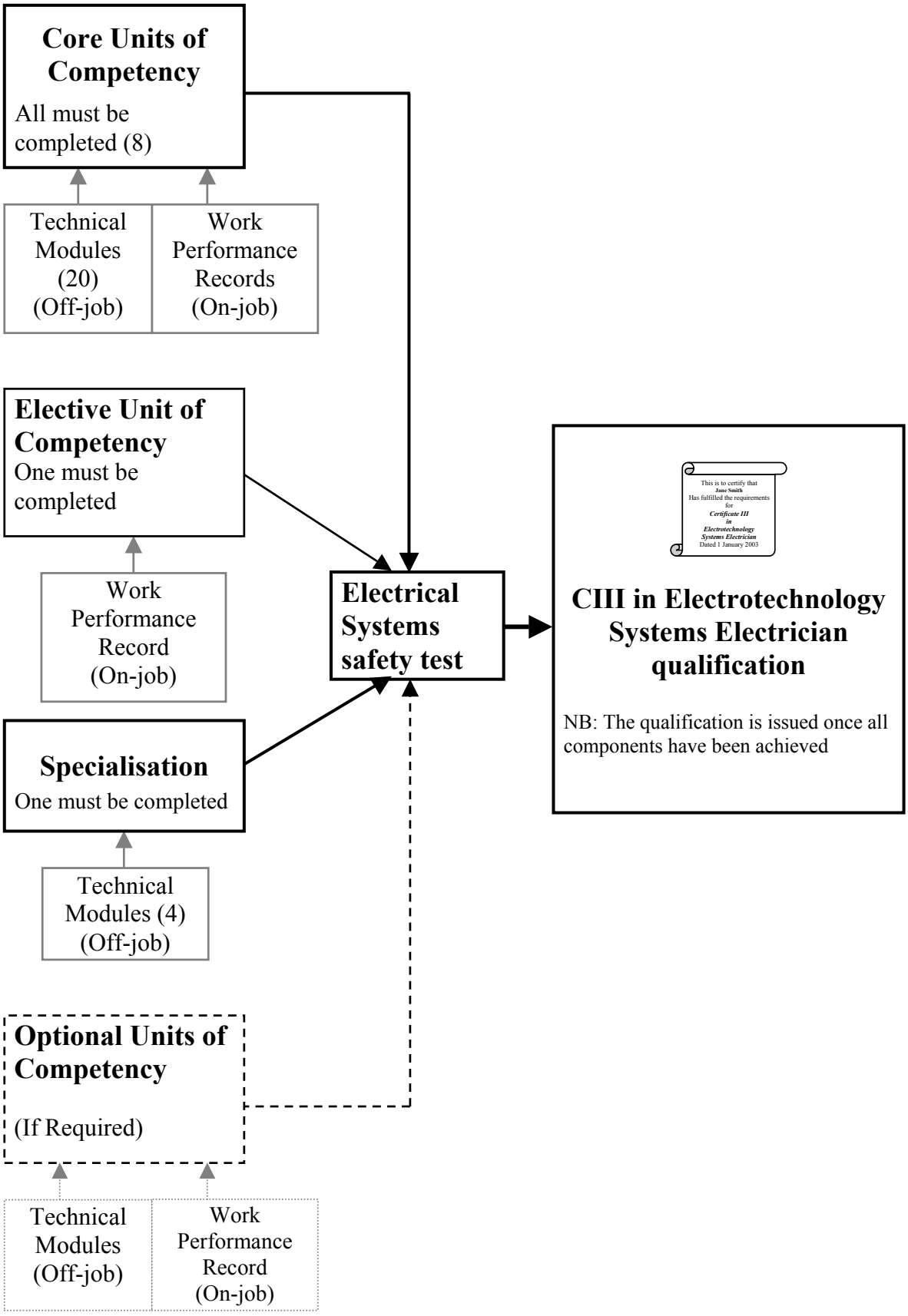
Optional Unit of Competency

The optional unit describes the supporting technical work or skill functions within the work environment that a learner / trainee need to further develop their skills and knowledge in a specialised area of the industry and which can be included as part of the qualification structure**.**

One or more optional units may be selected and completed from the units listed below for the CIII Electrotechnology Systems Electrician. The units are:

UTE NES011 A	Monitor energy usage in an electrotechnology context
UTE NES105h A	Install and terminate wiring systems - network communications
UTE NES107^A	Install explosion-protected equipment and wiring systems ^^
UTE NES110 A	Install and maintain fluid measurement equipment
UTE NES214^A	Maintain electrical equipment in hazardous areas (^^) *Note: ^ Endorsements to be reported*

Qualification Structure – CIII Electrotechnology Systems Electrician



Module Purpose:

This module provides methods and criteria for gathering evidence that shows a person has achieved the levels of workplace performance. An example of workplace performance module requirement - NES105gA Install and terminate wiring systems (Cable/wiring support and protection).

Prerequisites:

This module shall be undertaken in conjunction with modules that provide the knowledge and skills underpinning performance (technical modules).

Relationship to Competency Standards:

This module supports Unit NES105gA Install and terminate wiring systems (Cable/wiring support and protection) of the Electrotechnology Competency Standards.

Assessment Strategy

Assessment methods - Evidence of competent work performance may be gathered from real work activities, which are recorded by the use of work reports, logbooks, profiles or portfolios. The learner / trainee's immediate supervisor shall confirm the accuracy of the evidence that the learner / trainee presents in this way. The supervisor must be competent in the technical area. Alternatively, evidence may be obtained through formalised assessment events that simulate relevant work activities.

Conditions of assessment - Evidence of competent work performance can be gathered from the workplace or a simulated work environment. A simulated environment would necessarily include equipment, wiring systems and conditions similar to those encountered in a real workplace. As well as the generic aspects of competency, assessment should take into account variations between particular industry sectors and different enterprises. For example, equipment used in process industry may be different in some respects to that used in mining.

Resource requirements - Resources should be sufficient for participants to carry out activities, from which evidence may be gathered, on an individual basis. This will include access to tools, equipment, standards and other documents that are necessary to perform the activities required. Occupational health and safety requirements - A safe and healthy environment will be provided for participants and assessors as well as safety procedure with regard to assessment activity.

Learning Outcome Details

Learning Outcome 1: To demonstrate appropriate workplace experience.

Assessment criteria: In judging work performance it is essential that evidence regarding the following aspects of competency is considered.

1. Performance is autonomous and to requirements and occurs on at least 2 occasions for each of the following elements, working from technical drawings and relevant specifications: - Plan and prepare for installation- Install wiring systems- Inspect and notify completion of work, and

2. At least 4 of the following apparatus and associated circuits: - Unenclosed support (eg clips, saddles, hangers and ties)- Non-metallic conduit- Metallic conduit- Trunking- Cable tray/ladder- Underground- Aerial- Catenary
3. Applying techniques, procedures, information and resources relevant to performance. Judgement should be made on evidence gathered from a number of events and over a period showing the development of competent work performance.

1.5 Technical Modules

A full module is a technical subject consisting of 36 - 40 hours of study with assessments. Some modules are half modules 18 - 20 hours, others are one and half modules 54 - 60 hours and some are double modules 72 - 80 hours.

The qualification off-job component consists of 24 technical full modules in which -

- 20 modules underpin the core units of competency,
- 4 modules underpin the specialisation selected by the learner / trainee/employer and/or
- a substitute of up to 0.5 to 4 modules to underpin the optional unit, where selected.

Typically modules are grouped together in lots of 8 to form Stage 1, 2 and 3 of the course. These modules form an educational flow and depends upon the learner / trainee passing each module to have the best chance of passing the next module in the flow. Any learner / trainee failing a module must repeat that module and may be forced to repeat the stage if the module failed is a prerequisite module.

1.6 Electrical Systems Safety Assessment (Capstone Test)

This is the final test for your qualification, which will confirm competence as an electrician and cover the four essential criteria for the Certificate III Electrotechnology Systems Electrician. The four criteria are:

1. **Working safely with electricity;**
2. **Ensuring electrical installations are safe and tests are conducted in accordance with safe working requirements;**
3. **Selecting equipment that complies with standards and**
4. **Ensuring electrical protection systems operate as intended.**

This test will normally be undertaken in the last year of your apprenticeship when you have passed all your technical modules and sufficient work experience evidence has been submitted to and received by your Training Organisation (RTO) to sign off your work performance records for each applicable unit of competency.

The assessment will consist of three components, namely an electrical knowledge test, electrical installations planning test and electrical practical test, that confirms you indeed have the four essential criteria referred to above.

Notes:

2. Work Place Evidence Gathering

MODULE PURPOSE

This topic provides the learner / trainee with an overview why work place experience evidence is required and the various methods which may be employed to gather this evidence.

Objectives - To Achieve The Purpose Of This Topic:

At the end of this topic the learner / trainee will be able to:

- State the reasons why work place experience evidence must be recorded.
- List four (4) methods of gathering workplace experience evidence.
- Describe the basic structure and principles of using a log book to gather work place experience evidence.
- Describe the basic structure and principles of using electronic profiling scan cards to gather work place experience evidence.
- Describe the basic structure and principles of using a portfolio to present work place experience evidence.
- Describe the method of using a work place assessment to prove work place competence.

Contents

2.1 Introduction

In the Electrotechnology Industry, competence is achieved through regular exposure to recurring workplace events where knowledge and skills, developed in conjunction with the technical education underpinning modules delivered by a registered training organisation the skills required to meet the industry standards (units of competency) set out in the National Training Package.

To confirm workplace development, records of all learning activities need to be kept by a learner / trainee to satisfy the registered training organisation (RTO) that all requirements have been met. The way you record your workplace experiences/activities is different to the way your technical educational experiences will be recorded.

The recording process of your training has two main functions. The first is so that your RTO can check if you are getting enough exposure to the required range of practical experiences that have been deemed important by the industry. During your on-the-job

training, you should be exposed to a range of functions that are representative of normal work place activities. Your tasks and activities may be associated with plant and equipment, tools, components, electrical and electronic devices; and workplace procedures and processes; manufacturer's manuals; and the like.

The second more important function of the records is so that they can be analysed to see if your workplace performance is progressing towards the industry set competency levels or if some changes need to be made. This information, together with the information about your technical educational achievements (eg. modules), can be used to advise on how you are developing and progressing. It will also help determine your readiness for a final assessment to sit for the Electrical Systems Safety test.

There are currently four options for you, with your employer to provide workplace evidence, these are:

1. **Log Books**
2. **Electronic Profiling**
3. **Portfolio**
4. **Workplace Assessment**

2.2 Log Books

On a regular basis the learner / trainee, with the assistance of the Supervisor/Tradesperson, completes record sheets for each unit of competency being undertaken in the current period. The Supervisor/Tradesperson verifies the learner / trainee's record who returns it to the RTO at regular intervals for monitoring, feedback and recording.

2.3 Electronic Profiling

Profiling is an innovative electronic workplace skill development system that reports on the work experiences of learners, such as apprentices / trainees. It is a cost-effective and non-intrusive tool that will be used by registered training organisations (RTO's), like TAFE or Industry Skill Centres, in partnership with employers, in assessing a learner's competence for issuance of a national qualification. Profiling requires the progressive collection, documentation and judgement of evidence generally over an extended period of time.

In a competency system, the focus of the evidence is set against the critical aspects detailed in the unit of competency and the collection process staged against known and pre-planned industry set workplace occurrences.

Profiling requires a series of audits and may include a final holistic assessment event.

2.4 Portfolio

Requires the progressive collection or build up of indirect evidence in relation to the individual's competence. Generally used by experienced workers.

It may include certificates of attainment, suitably focussed references and/or testimonials, formal project appraisals, work records and/or any other evidence that is current and relevant to the competency sought.

2.5 Workplace Assessment

An approach in which evidence of competency is gained from using a formal assessment event on the job for each competency unit (some units may be combined as one assessment event). The employer and/or the RTO will need to recruit a qualified Workplace Assessor to carry out the assessments and determine who will issue the credential / qualification / statement of attainment.

Notes:

3. Log Books

MODULE PURPOSE

To be able to accurately complete the manual log book entries for each unit of competency, which makes up the Certificate III Electrotechnology Systems Electrician qualification.

Objectives - To Achieve The Purpose Of This Module:

At the end of this topic the learner / trainee will be able to:

- State the layout of the Work Experience Record Book.
- State the layout of the unit of competency page in the Work Experience Record Book.
- State the different between the three levels of supervision.
- Define the levels of activities for each unit
- List the range of variables for each units in terms of types of cable support/protection, cables, apparatus and electrical tests.
- Complete the unit of competency pages for the exercises given.

Contents

3.1 Introduction

The log book may be known as the *Work Experience Record Book,* which is a record of the on-the-job experience of the learner / trainee for the *Certificate III in Electrotechnology Systems Electrician.* It is designed to be a record of all the training and experience encountered at work and perceived, analysed and advice rendered by an RTO in consultation with the learner / trainee and employer.

The ***Work Experience Record Book*** will:

- Provide details of the learning program the learner / trainee is doing, which moves from basic to more advanced skills.
- Provide a detailed record of workplace skills and knowledge required and set by the Electrotechnology industry.

3.2 Work Experience Record Book Layout

The Record book is divided into two parts, these are:

1. **Information Sections**
    - Introduction
    - Training Package Information
    - Training Plan
    - Module Completion Table
    - Work Experience Records
    - Useful Contacts
2. **Work Experience Record Forms**
    - Core Units of Competency Forms
    - Specialisation Forms
    - Elective Units of Competency Forms
    - Optional Units of Competency Forms

3.3 Competency Unit Page Layout

The competency unit page is divided into six areas, these are:

1. **Identification**
    - Learner / trainee Name
    - Learner / trainee Number
    - Week Ending Date
2. **Competency Unit Name and Description**
3. **Table 1 - Weekly record of activities/level of supervision**
4. **Table 2 - Weekly record of range of variables/level of supervision**
5. **Competence level to be achieved for the unit.**
6. **Verification of records**
    - Learner / trainee Signature
    - Qualified Supervisors Name, Licence Number, Signature and Date
    - Teachers Name, Signature and Date

3.4 Level of Supervision

- **Direct** - where close or continuous supervision is provided.
- **General** - where regular supervision is provided to successfully complete the work undertaken.
- **Broad** - where minimal supervision is provided to successfully complete the work undertaken.

3.5 Work Experience Exposure

- **The Number of Times** - one time (1) equals approximately a 4 hour period that the learner has carried out the activity.
- **Week** is the number of times the learner has carried out the activity in a week.
- **Total** is the progressive total that is the number of times the learner has carried out the activity during all the weeks.

3.6 Competency Unit Elements

Elements are the activities that make up a competency unit. The competency unit in the Electrotechnology industry are divided into three elements:

- Prepare and plan
- Carry Out
- Complete and notify.

Note: *Whole of Job covers all the three elements i.e. Prepare / Plan, Carry Out and Complete / notify.*

Element – Prepare and Plan - This involves activities such as preparing and planning to carry out a full job in accordance with OH&S requirements, plans and specifications, codes and regulations, company procedures. This includes sequencing and coordination of work, organising necessary materials, tools and equipment.

Element - Carry Out - This involves actually doing the work, in accordance with requirements, and to an acceptable standard.

Element - Completed - This involves the final inspection and reporting that the job has been completed in accordance with the requirements and to an acceptable standard.

Whole of Job - This involves the carrying out the whole job including the planning, carrying out and completion.

3.7 Technical Core Units of Competency - CIII Systems Electrician

There are 7 technical core units of competency to make up the CIII Electrotechnology Systems Electrician qualification, these are:

1. NES105gA - Install and terminate wiring systems- *cable support*
2. NES105jA - Install and terminate wiring systems - *cables - low voltage*
3. NES106bA - Install electrical/electronic apparatus - *electrical*
4. NES206bA - Maintain & repair apparatus & associated circuits - *electrical*
5. NES301bA - Undertake commissioning procedures - *electrical*
6. NES402bA - Test apparatus and circuits - *electrical*
7. NES501bA - Diagnose and rectify faults – *electrical*

1. **NES105gA Install and terminate wiring systems (cable/wiring support and protection)**

   Types of Support/Enclosures:

   - Unenclosed support
   - Non-metallic conduit
   - Metallic conduit
   - Trunking
   - Cable tray/ladder

2. **NES105jA Install and terminate wiring systems (power and control - low voltage)**

   Types of Cables:

   - Thermoplastic insulated cable
   - Thermoplastic sheathed flat cable
   - Thermoplastic sheathed circular cable
   - Armoured cable
   - Fire performance cables
   - Special cables
   - Signal cables

3. **NES106bA Install electrical/electronic apparatus (electrical)**

   Types of Apparatus:

   - Switchboards
   - Protection devices
   - Single phase motors & controls
   - Three phase motors & controls
   - Synchronous machines
   - DC machines & controls
   - Lighting
   - Heating

- Sockets outlets
- Control devices

4. **NES206bA Maintain and repair apparatus and associated circuits (electrical)**

   Types of Apparatus:

   - Switchboards
   - Protection devices
   - Single phase motors & controls
   - Three phase motors & controls
   - Synchronous machines
   - DC machines & controls
   - Lighting
   - Heating
   - Sockets outlets
   - Control devices

5. **NES301bA Undertake commissioning procedures of apparatus and associated circuits. (electrical)**

   Types of Apparatus:

   - Switchboards
   - Protection devices
   - Single phase motors & controls
   - Three phase motors & controls
   - Synchronous machines
   - DC machines & controls
   - Lighting
   - Heating
   - Sockets outlets
   - Control devices

6. **NES402bA Test apparatus and circuits (electrical)**

   Types of Tests:

   - Insulation resistance
   - Polarity
   - Continuity earthing
   - Correct connections
   - Isolation

- Fault-loop impedance
- Load current of appliance/apparatus
- Appliance/apparatus performance characteristics
- Apparatus calibration
- Leakage current

7. NES501bA Diagnose and rectify faults in apparatus and associated circuits (electrical)

Types of Apparatus:

- Switchboards
- Protection devices
- Single phase motors & controls
- Three phase motors & controls
- Synchronous machines
- DC machines & controls
- Lighting
- Heating
- Sockets outlets
- Control devices

3.8 How to Complete Your Log Book

To complete the log book for each competence unit, the following procedures should take place:

Step 1:

Write the date for the week ending - Saturday date i.e 10/08/2002

Write your name - First and Family name i.e John Citizen

Write your Learner / trainee Number i.e 733456

Example:

Work Experience Record **Week Ending:** ***10/08/2002***

Learner / trainee Name: ***John Citizen***
Learner / trainee No: ***733456***

Step 2:

Record the number of times in the "week" column you have spend working in the area of the unit for that activity:

- Planned
- Carried Out
- Completed or
- Whole of Job

And the level of Supervision for each activity:

- Direct
- General or
- Broad

(Remember Number of Times = 4 hour period)

That is, 20 hours (= 5) under direct supervision in the activity carrying out and 4 hours (= 1) under general supervision in the activity carrying out.

Add the total of times for type of activity/level of supervision i.e 5 this week plus 2 from the previous week = 7

Example:

Weekly Record - Number of Times						
Activities	**Level of Supervision**					
	Direct		**General**		**Broad**	
	Week	**Total**	**Week**	**Total**	**Week**	**Total**
Planned						
Carried Out	*5*	*7*	*1*	*3*		
Completed						
Whole of Job (plan, do & complete)						

Step 3:

Record the number of times in the "week" column you have spend working on the type of accessories/cables/equipment or tests associated with the unit of competence and the level of Supervision.

- Add the total of times for type of accessories/cables/equipment/level of supervision.

Example: The work was in relation to the following:

Weekly Record - Number of Times						
Types of Cables	**Level of Supervision**					
	Direct		**General**		**Broad**	
	Week	**Total**	**Week**	**Total**	**Week**	**Total**
Thermoplastic insulated cable	*4*	*9*				
Thermoplastic sheathed flat cable	*4*	*4*	*1*	*2*		
Thermoplastic sheathed circular cable	*1*	*3*				
Armoured cable						
Fire performance cable						
Special cables						
Signal cable						

Step 4:

- Sign the page and place the actual date
- Have your Supervisor/Tradesperson write their name, Qualified Supervisor Licence number, sign and date the page.
- At regular intervals, your trainer will check and copy these pages. The trainer will let you know when he/she will require to see the log book.

Example: This is a record of the work performed.

Learner / trainee Signature: ***J Citizen***

Date: 10-8-02

Qualified Supervisors Name: B Bloggs

Licence No: 123456

Qualified Supervisors Signature: *B Bloggs*

Date: 10-8-02

Teacher Name: A Smith **Signature:** *A Smith*

Date: 14-8-02

3.9 Learner / trainee Example

Using the following example of a domestic installation, complete the relevant units of competency records for a learner / trainee under general supervision completing the installation.

Installation Specifications

- Three Phase underground mains - 16 mm2 (4 hours labour)
- Single phase submain to shed - 4 mm2 in heavy duty PVC conduit
- Three socket outlet circuits
- Three lighting circuits
- One hot water system circuit - off peak 4.8 kW
- One electric range circuit - 10 kW
- Four ceiling fans
- One three phase 6 kW air conditioner circuit
- Three TV antenna outlets - 75 Ω coaxial
- Front door bell with CCTV
- Two telephone points using 2 pair phone wire
- 8 hours for roughing in the wiring, 8 hours for fit out, 2 hours for testing.

3.10 Learner / trainee Exercises

Learner / trainee Exercise 1

Using the learner / trainee diary entry in Appendix A for Learner / trainee working in the servicing area under direct supervision, complete the relevant unit of competency work experience record book pages.

Learner / trainee Exercise 2

Using the learner / trainee diary entry in Appendix A for Learner / trainee working in the installation area under direct supervision, complete the relevant unit of competency work experience record book pages.

Learner / trainee Exercise 3

Using the learner / trainee diary entry in Appendix A for Learner / trainee working in the servicing area under general supervision, complete the relevant unit of competency work experience record book pages.

Learner / trainee Exercise 4

Using the learner / trainee diary entry in Appendix A for Learner / trainee working in the installation area under general supervision, complete the relevant unit of competency work experience record book pages.

Learner / trainee Exercise 5

Using the learner / trainee diary entry in Appendix A for Learner / trainee working in the servicing area under broad supervision, complete the relevant unit of competency work experience record book pages.

Learner / trainee Exercise 6

Using the learner / trainee diary entry in Appendix A for Learner / trainee working in the installation area under broad supervision, complete the relevant unit of competency work experience record book pages.

Notes:

4. Electronic Profiling

MODULE PURPOSE

To be able to accurately complete the electronic profiling scan card for the units of competency, which makes up the Certificate III Electrotechnology Systems Electrician qualification

Objectives - To Achieve The Purpose Of This Topic:

At the end of this topic the learner / trainee will be able to :

- Complete the Release of Information registration form.
- State the layout of the Profiling Scan Card.
- Define the levels of activities for each unit
- State the different between the three levels of supervision.
- List the range of variables for each units in terms of types of cable support/protection, cables, apparatus and electrical tests.
- Complete the Profiling Scan Card.

Contents

4.1 Introduction

Electronic profiling is a modern and innovative information gathering system that records and monitors the on the job work experience of an learner / trainee.

The information gathered from the profiling cards is used as evidence towards the achievement of competency in the workplace by measuring the breadth and scope of the workplace experiences.

4.2 Registration Form

To register into the profiling system, you must complete the EE Network ITABS - Release of Information - Electrotechnology Industry form. This form has two parts:

1. Learner / trainee and employer details
2. Employment/Qualification details (back of the form)

4.3 Profiling Scan Card Layout

The Profiling Scan Card is divided into six (6) component areas, these are:

- Learner / trainee Identification
- Time exposed
- Activities
- Supervision Level
- Units range of variables
- Verification

Learner / Trainee Identification

- Profiling Registration No. - forms are pre-printed with your registration number already on the form.
- Learner / trainee Surname
- Learner / trainee Signature

Time exposed - this is how you will record your hours undertaking the various work activities

- Up to 2 hrs
- 4 hours
- 8 hours
- 16 hours
- 32 hours
- Total hours

Activities - elements of the competency unit.

- **Prepared and Planned** - This involves activities such as preparing and planning to carry out a full job in accordance with OH&S requirements, plans and specifications, codes and regulations, company procedures. This includes sequencing and coordination of work, organising necessary materials, tools and equipment.
- **Carried Out** - This involves actually doing the work, in accordance with requirements, and to an acceptable standard.
- **Completed** - This involves the final inspection and reporting that the whole job has been completed in accordance with the requirements and to an acceptable standard.

4.4 Technical Core Units of Competency - CIII Systems Electrician

There are 7 technical core units of competency to make up the CIII Electrotechnology Systems Electrician qualification, these are:

NES105gA - Install and terminate wiring systems- *cable support*

NES105jA - Install and terminate wiring systems - *cables - low voltage*

NES106bA - Install electrical/electronic apparatus – *electrical*

NES206bA - Maintain & repair apparatus & associated circuits – *electrical*

NES301bA - Undertake commissioning procedures – *electrical*

NES402bA - Test apparatus and circuits – *electrical*

NES501bA - Diagnose and rectify faults – *electrical*

1. **NES105gA Install and terminate wiring systems (cable/wiring support and protection)**

   Types of Support/Enclosures:

   - Aerial
   - Cable tray/ladder
   - Catenary support
   - Metallic conduit
   - Non-metallic conduit
   - Trunking
   - Underground systems
   - Unenclosed support (eg clips, saddles, ties)

2. **NES105jA Install and terminate wiring systems (power and control - low voltage)**

   Types of Cables:-

   - Armoured cable
   - Fire performance cables (eg MIMS)
   - Signal cable (eg. shielded inst cable)
   - Special cables (eg. trailing cables)
   - Thermoplastic insulated cable
   - Thermoplastic sheathed flat cable
   - Thermoplastic sheathed circular cable
   - Other

3. **NES106bA Install electrical/electronic apparatus (electrical)**

   Types of Apparatus:-

   - Control devices
   - Heating
   - Lighting
   - Protection devices
   - Sockets outlets
   - Switchboards
   - DC motors & controls
   - Single phase motors & controls
   - Synchronous motors & controls
   - Three phase motors & controls
   - Other

4. **NES206bA Maintain and repair apparatus and associated circuits (electrical)**

   Types of Apparatus:-

   - Control devices
   - Heating
   - Lighting
   - Protection devices
   - Sockets outlets
   - Switchboards
   - DC motors & controls
   - Single phase motors & controls
   - Synchronous motors & controls
   - Three phase motors & controls
   - Other

5. **NES301bA Undertake commissioning procedures of apparatus and associated circuits. (electrical)**

   Types of Apparatus:

   - Control devices
   - Heating
   - Lighting
   - Protection devices
   - Sockets outlets

- Switchboards
- DC motors & controls
- Single phase motors & controls
- Synchronous motors & controls
- Three phase motors & controls
- Other

6. NES402bA Test apparatus and circuits (electrical)

Types of Tests - Mandatory:

- Continuity
- Insulation
- Polarity
- Correct connections (eg. switching as intended)
- Isolation
- Types of Tests – Others:-
- Loop impedance
- Calibration
- Leakage
- Load current
- Performance characteristics
- Other

7. NES501bA Diagnose and rectify faults in apparatus and associated circuits (electrical)

Types of Apparatus:

- Control devices
- Heating
- Lighting
- Protection devices
- Sockets outlets
- Switchboards
- DC motors & controls
- Single phase motors & controls
- Synchronous motors & controls
- Three phase motors & controls
- Other

8. **<u>Optional Unit:</u> NES105gA Install and terminate wiring systems (network communication)**

   Types of Cables:-

   - Coaxial
   - Optical fibre
   - Structured (cat5/5+)
   - Patchcords
   - Telephone (cat3/4)
   - Other

   <u>Supporting Work:</u>

   - Follow safety procedures
   - Use information systems
   - Protect the environment
   - Document activities

4.5 How to Complete Your Profiling Scan Card

To complete the electronic profile scan card, the following procedures should take place:

Step 1: Write your surname in block letters in the space provided

Step 2: Select the areas you have worked in this period and using a 2B or HB pencil shade in the relevant circles

Step 3: Record the approximate time for each area and place the total in the box

This week, I:	Install Support	Install/terminate	Install Network	Test Apparatus	Install apparatus	Commission	Diagnose/rectify	Maintain apparatus	Install explosion protected equip	Maintain hazardous area equip	Monitor energy usage	Install/maintain fluid mgtequip	Electrical supporting activities	Off-job training attended (eg college)	Sick	Leave/RDO etc
Worked in the these areas																
Choose multiple combinations of hours																
For approximately Up to 2 hrs																
Up to 4 hrs																
Up to 8 hrs																
Up to 16 hrs																
Up to 32 hrs																

Total Hours:

Step 4: Record the activities (planned, carried out and/or completed) for each area worked in

Step 5: Record the supervision level for each area you have worked in

This week, I:	Install support / protection	Install / terminate LV cables	Install Network comms cables		Test Apparatus / Circuits	Install Apparatus	Commission apparatus / circuits	Diagnose / rectify faults app/circuits	Maintain apparatus / circuits	Install explosion protected equip	Maintain hazardous area equip	Monitor energy usage	Install / Maintain fluid mgt equip.	Electrical supporting activities	Off-job training attended (eg: college)	Sick	Annual leave / RDO etc
Worked in these areas	●	●	○		●	●	○	○	○	○	○	○	○	○	●	●	○
And I planned (ie: interpreted diag etc)	●	○	○	○	○	○	○	○	○	○	○	○	○				
Choose one or more																	
Carried out (ie: conducted work)	●	●	○		●	●	○	○	○	○	○	○	○				
Completed (ie: Compliance etc)	○	○	○		○	○	○	○	○	○	○	○	○				
Choose one or more																	
Whilst under direct/constant supervision	○	○	○		●	○	○	○	○	○	○	○	○				
General intermittent supervision	○	●	○		○	●	○	○	○	○	○	○	○				
Broad supervision	●	○	○		○	○	○	○	○	○	○	○	○				

Step 6: For each unit, record the cable/wiring support/protection, cables, apparatus and testing.

Step 7: Record the support work

Step 8: Have your Tradeperson/Supervisor write their name, Qualified Supervisor Licence number, sign and date the page.

Sign the top of the form yourself

This week I:		Install support / protection	Install / terminate LV cables	Install Network comms cables		Test Apparatus / Circuits	Install Apparatus	Commission apparatus / circuits	Diagnose / rectify faults app/circuits	Maintain apparatus / circuits	Install explosion protected equip	Maintain hazardous area equip	Monitor energy usage	Install / Maintain fluid mgt equip.	Electrical supporting activities	Off-job training attended (eg: college)	Sick	Annual leave / RDO etc
Worked in these areas		●	●	○		●	●	○	○	○	○	○	○	○	○	●	●	○
Cable Wiring support protection - aerial	Cable tray/ladder	●	○	○	○	○	○	○	○	○	○	○	○					
	Catenary support																	
	Metallic Conduit																	
	Non-metallic																	
	Trunking																	
	Underground systems																	
	Unenclosed support (eg: clips, saddles,)																	
	Other																	
Choose one or more																		
Carried out (ie: conducted work)		●	●	○		●	●	○	○	○	○	○	○	○				
Completed (ie: Compliance etc)		○	○	○		○	○	○	○	○	○	○	○	○				
Choose one or more																		
Whilst under direct/constant supervision		○	○	○		●	○	○	○	○	○	○	○	○				
General intermittent supervision		○	●	○		○	●	○	○	○	○	○	○	○				
Broad supervision		●	○	○		○	○	○	○	○	○	○	○	○				

4.6 Learner / trainee Example

Using the following example of a domestic installation, complete the relevant units of competency records for a learner / trainee under general supervision completing the installation.

Installation Specifications

- Three Phase underground mains - 16 mm2 (4 hours labour)
- Single phase submain to shed - 4 mm2 in heavy duty PVC conduit
- Three socket outlet circuits
- Three lighting circuits
- One hot water system circuit - off peak 4.8 kW
- One electric range circuit - 10 kW
- Four ceiling fans
- One three phase 6 kW air conditioner circuit
- Three TV antenna outlets - 75 Ω coaxial
- Front door bell with CCTV
- Two telephone points using two pair phone cable
- 8 hours for roughing in the wiring, 8 hours for fit out, 2 hour for testing.

4.7 Learner / trainee Exercises

Learner / trainee Exercise 1

Using the learner / trainee diary entry in Appendix A for learner / trainee working in the servicing area under direct supervision, complete the relevant unit of competency work experience record book pages.

Learner / trainee Exercise 2

Using the learner / trainee diary entry in Appendix A for learner / trainee working in the installation area under direct supervision, complete the relevant unit of competency work experience record book pages.

Learner / trainee Exercise 3

Using the learner / trainee diary entry in Appendix A for learner / trainee working in the servicing area under general supervision, complete the relevant unit of competency work experience record book pages.

Learner / trainee Exercise 4

Using the learner / trainee diary entry in Appendix A for learner / trainee working in the installation area under general supervision, complete the relevant unit of competency work experience record book pages.

Learner / trainee Exercise 5

Using the learner / trainee diary entry in Appendix A for learner / trainee working in the servicing area under broad supervision, complete the relevant unit of competency work experience record book pages.

Learner / trainee Exercise 6

Using the learner / trainee diary entry in Appendix A for learner / trainee working in the installation area under broad supervision, complete the relevant unit of competency work experience record book pages.

Notes:

5. Recognition of Prior workplace Experience

MODULE PURPOSE

To examine methods of recognising and reporting learner / trainee prior workplace experience for the units of competency, which makes up the Certificate III Electrotechnology Systems Electrician qualification.

Objectives - To Achieve The Purpose Of This Topic:

At the end of this topic the learner / trainee will be able to:

- Complete the Work Experience Record Book or electronic profiling scan cards to report prior workplace experience.
- Provide proof of the workplace experience evidence currency.
- Provide proof of the workplace experience evidence authenticity.

Contents

5.1 Introduction

Many learner / trainee's may have prior workplace experience in the units of competency which made up this qualification which can be used as evidence. The Work Experience Record Book or Electronic Profiling Scan Cards can be used to record this evidence but the RTO will need to have proof of the currency and authenticity of this evidence.

5.2 Methods of Recording Evidence

The existing tools used to record workplace experience evidence can also be used to collect prior workplace experience evidence. The evidence may come from diaries, log books, learner / trainee record books, references, job cards, work orders, etc

Using ***Work Experience Record*** Book

To complete the log book for each competence unit of prior experience evidence, follow the procedures below:

Step 1:

- Write the time period of the evidence in the week ending space i.e February 2000 - December 2001
- Write your name - First and Family name i.e Kim Citizen
- Write your Learner / trainee Number i.e 733456

Example:

Work Experience Record **Week Ending:** ***Feb.2000 -Dec.2001***

Learner / trainee Name: ***Kim Citizen***
Learner / trainee No: ***733456***

Step 2:

Record the number of times for the period in the "total" column you have spend working in the area of the unit for that activity:

- Planned
- Carried Out
- Completed or
- Whole of Job

and the level of Supervision for each activity:

- Direct
- General or
- Broad

(Remember Number of Times = 4 hour period)

That is, 20 hours (= 5) under direct supervision in the activity carrying out and 4 hours (= 1) under general supervision in the activity carrying out.

Example:

Weekly Record - Number of Times						
Activities	**Level of Supervision**					
	Direct		**General**		**Broad**	
	Week	**Total**	**Week**	**Total**	**Week**	**Total**
Planned		3		1		
Carried Out		15		*5*		2
Completed		2				
Whole of Job (plan, do & complete)						

Step 3:

- Record the number of times in the "total" column you have spend working on the type of accessories/cables/equipment or tests associated with the unit of competence and the level of Supervision.

Example: The work was in relation to the following:

Weekly Record - Number of Times						
Types of Cables	**Level of Supervision**					
	Direct		**General**		**Broad**	
	Week	**Total**	**Week**	**Total**	**Week**	**Total**
Thermoplastic insulated cable		9		5		
Thermoplastic sheathed flat cable		4		2		1
Thermoplastic sheathed circular cable		3		1		
Armoured cable						
Fire performance cable						
Special cables						
Signal cable		2				

Step 4:

- Sign the page and place the actual date
- Have your Supervisor/Tradesperson write their name, Qualified Supervisor Licence number, sign and date the page.
- Your teacher will check and copy these pages.

Using Electronic Profiling Scan Cards

To complete the electronic profile scan card to record prior experience, the following procedures should take place:

Step 1:

- Write your surname in block letters in the space provided on a space card located at the back of the pad.

Step 2:

- Select the unit you have worked in this period and using a 2B or HB pencil shade in the relevant circles

Step 3:

- Record the approximate time for each unit. (maximum time 62 hours)

Example:

This week, I:		Install support/protection	Install/terminate LV cables	Install Network comms cables		Test Apparatus/circuits	Install apparatus	Commission apparatus/circuits	Diagnose/rectify faults app/circuits	Maintain apparatus/circuits	Install explosion protected equip	Maintain hazardous area equip	Monitor energy usage	Install/maintain fluid m'ment equip	Electrical supporting activities	Off-job training attended (eg college)	Sick	Leave/RDO etc	
	Worked in the these areas	●○	●	●		●	●	○	○	○	○	○	○	○	○	○	○	○	
Choose multiple combinations of hours	**For approximately up to 2 hrs**	○	○	●		●	○	○	○	○	○	○	○	○	○	○	○	○	
	4 hours	●	○	●		○	●	○	○	○	○	○	○	○	○	○	○	○	
	8 hours	●	●	○		●	○	○	○	○	○	○	○	○	○	○	○	○	
	16 hours	○	●	○		○	○	○	○	○	○	○	○	○	○	○	○	○	**Hours**
	32 hours	●	●	○		○	●	○	○	○	○	○	○	○	○	○	○	○	

Step 4:

- Record the activities (planned, carried out and/or completed) for each unit worked in

Step 5:

- Record the supervision level for each unit you have worked in

This week I:		Install support/protection	Install/terminate LV cables	Install Network comms cables		Test Apparatus/circuits	Install apparatus	Commission apparatus/circuits	Diagnose/rectify faults app/circuits	Maintain apparatus/circuits	Install explosion protected equip	Maintain hazardous area equip	Monitor energy usage	Install/maintain fluid m'ment equip	Electrical supporting activities	Off-job training attended (eg college)	Sick	Leave/RDO etc
	Worked in the these areas	●	●	●		●	●	○	○	○	○	○	○	○	○	○	○	○
Choose one or more	And I planned (ie interpreted diag etc)	●	○	○		○	○	○	○	○	○	○	○	○				
	Carried out (ie conducted work)	●	●	●		●	●	○	○	○	○	○	○	○				
	Completed (ie compliance etc)	○	○	○		○	○	○	○	○	○	○	○	○				
Choose one or more	Whilst under direct / constant supervision	●	●	●		●	○	○	○	○	○	○	○	○				
	General/intermittent supervision	●	●	○		○	●	○	○	○	○	○	○	○				
	Broad supervision	●	○	○		○	○	○	○	○	○	○	○	○				

Step 6:

- For each unit, record the cable/wiring support/protection, cables, apparatus and testing.

Step 7:

- Record the support work

Step 8:

- Have your Tradeperson/Supervisor write their name, Qualified Supervisor Licence number, sign and date the page.
- Sign the top of the form yourself

This week I:	Install support/protection	Install/terminate LV cables	Install Network comms cables		Test Apparatus/circuits	Install apparatus	Commission apparatus/circuits	Diagnose/rectify faults app/circuits	Maintain apparatus/circuits	Install explosion protected equip	Maintain hazardous area equip	Monitor energy usage	Install/maintain fluid m'ment equip	Electrical supporting activities	Off-job training attended (eg college)	Sick	Leave/RDO etc
Worked in the these areas	●	●	○		●	●	○	○	○	○	○	○	○	○	○	○	○

Cable/wiring support protection										**Apparatus**
Aerial	○					○	○	○	○	Control devices
Cable tray/ladder	○					○	○	○	○	Heating
Catenary support	○					○	○	○	○	Lighting
Metallic conduit	○					○	○	○	○	Protection devices
Non-metallic conduit	●					○	○	○	○	Socket outlets
Trunking	○					○	○	○	○	Switchboards
Underground systems	●					○	○	○	○	DC motors & controls
Unenclosed support (eg. clips, saddles, ties)						○	○	○	○	Single phase motors & controls

Other	○					○	○	○	○	Synchronous motors & controls
Power and control - LV cables		○				○	○	○	○	Three phase motors & controls
Armoured cables										
Fire performance cables (eg MIMS)		○				○	○	○	○	Other
Signal cables (eg shielded inst cable)		●								**Mandatory testing**
Special cables (eg trailing cables)		○			●					Continuity
Thermoplastic insulated cable		●			●					Insulation
Thermoplastic sheathed flat cable		●			●					Polarity
Thermoplastic circular cable		○			●					Correct connections (eg. switching as intended)
Other		○			●					Isolation
Network communications cables			○		○					Loop impedance
Coaxial										**Other testing**
Optical fibre			○		○					Calibration
Structured (cat5/5+)			○		●					Leakage
Patchcords			○		○					Load current
Telephone (cat3/4)			○		○					Performance testing
Other			○		○					Other

5.3 Proof of Currency and Authenticity of Evidence

The evidence presented must be authentic and current and therefore must have proof of these two quantities.

- **Currency:** Currency of evidence means that the evidence is suitable for making decisions about what the learner / trainee knows and how the learner / trainee can carry out the specified skills at the current time and in the immediate future. Hence, the RTO needs to have proof of the recency of the evidence from the workplace.
- **Authenticity:** Authentic evidence means that the evidence actually relates to the performance of the person being assessed and is therefore not fabricated in any form or manner.

Evidence submitted using electronic profiling scan cards or work experience record books for the recognition of prior workplace experience will need to be verified by a qualified supervisor.

Verification can be in the form of the following items:

- Copies of diary entries certified by supervisor
- Copies of log book entries certified by supervisor
- Copies of job cards certified by supervisor
- Copies of supervisor reports certified by supervisor
- References outlining work undertaken certified by supervisor

Other items may be suitable and therefore used, but must be certified by the workplace supervisor who is suitably technically qualified in this area of the work undertaken.

Notes:

6. Work Place Experience Evidence Monitoring and Reporting

MODULE PURPOSE

To be able to interpret learner / trainee's three monthly reports produced from the electronic profiling system and/or the reporting system used for the Work Experience Record Books for the units of competency which makes up the Certificate III Electrotechnology Systems Electrician qualification.

Objectives - To Achieve The Purpose Of This Topic:

At the end of this topic the learner / trainee will be able to:

- Explain the need for monitoring and reporting of workplace experience evidence
- Interpret the reports produced by the electronic profiling system
- State the procedure used for the monitoring and reporting workplace evidence when using the Work Experience record Book.

Contents

6.1 Introduction

Monitoring and reporting are important in providing information on the learner / trainee progress and skill development and will allow the RTO assessor to recommend any actions to improve the learner / trainee training program. Learner / trainee and their supervisor need to understand the reporting procedures to ensure the learner / trainee continue progress towards achieving his/her qualification.

6.2 Electronic Profiling Reports

The reports are computer generated every three (3) months and send to the learner / trainee supervisor and the college / skills centre.

The outputs of the technical work experience records are reports summarising the detail of the records. These reports are in several forms (bar and pie charts and text) and give simple, yet precise, pictures or trends of where a particular learner / trainee is in relation to specific units and the overall training program.

One of the most important aspects of these reports is the increment in achievement between reporting periods and the progress that is being made. This progress is shown by growth in the bars representing individual units and the relative proportions of the pie charts growth being indicated by increasing autonomy, less supervision.

Another important aspect of these reports is the balance of achievement across units. Simpler units should show more rapid growth and more complex units, slower growth.

Additionally, these reports show that currency of competency is being regularly maintained, particularly for units satisfied early in the training program. Currency is indicated when the number at the end of the bar of the completed units gets higher between reports. The higher number represents increased exposure to completed units.

Work experience information ensures that supervisors are able to provide the necessary distribution of work experience to meet the needs of the units being undertaken, that is, to ensure that no unit is missed and that the learner / trainee is not kept on the types of jobs they are good at or that they prefer or jobs their supervisor wishes to avoid.

The reports also provide a means of observing the progress of the learner / trainee from direct supervision to board supervision and from simply doing tasks planned by others to doing the planning and completion of the whole job.

The profiles of individual learner / trainee may be compared with the industry standard for a learner / trainee with comparable work experience. These comparisons are helpful for auditing as they highlight any significant differences with the industry standard. These can then be explained in respect of the particular circumstances of the learner / trainee or cause a review of the way the data is being entered or interpreted.

The computer program that analyses the raw data is written in such a way that individuals whose progress appears to be significantly different to the industry norm or trend will have queries raised of their reports. These queries will need to be reviewed / highlighted by the RTO, assessor and answered by the learner / trainee and the supervisor.

The three monthly report will normally consist of the following:

- Bar graphs and
- Pie Charts

Management reports showing the number of scan cards submitted for the period can also be useful as a monitoring tool of the learner / trainee progress.

1. Bar Graph Report

These reports show the units of competency (cores and one optional) represented by a bar graph.

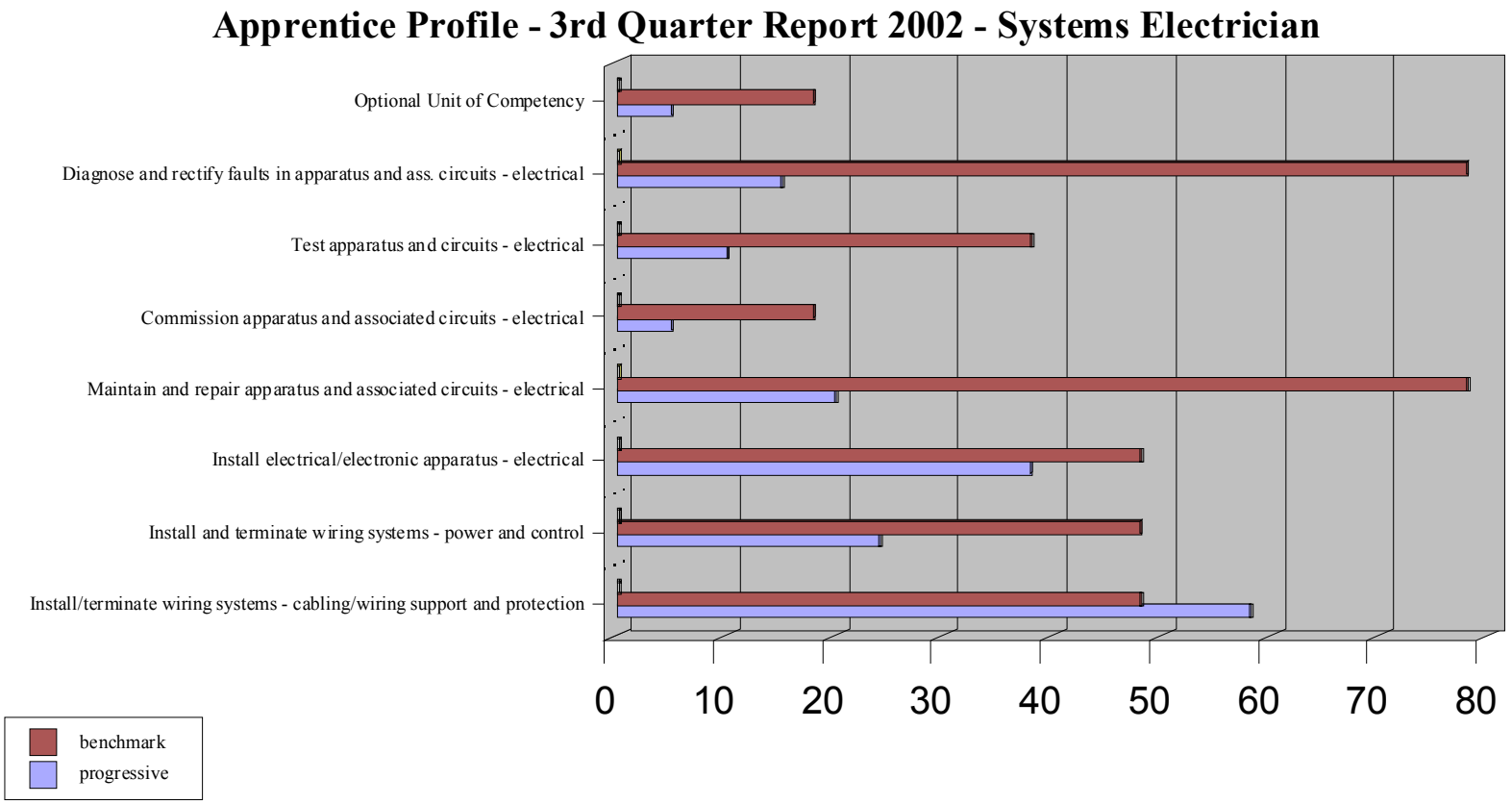
The bar graphs for each unit will show one graph for the predicted industry benchmark and the second bar graph will represent the progressive bar.

2. Pie Chart Report

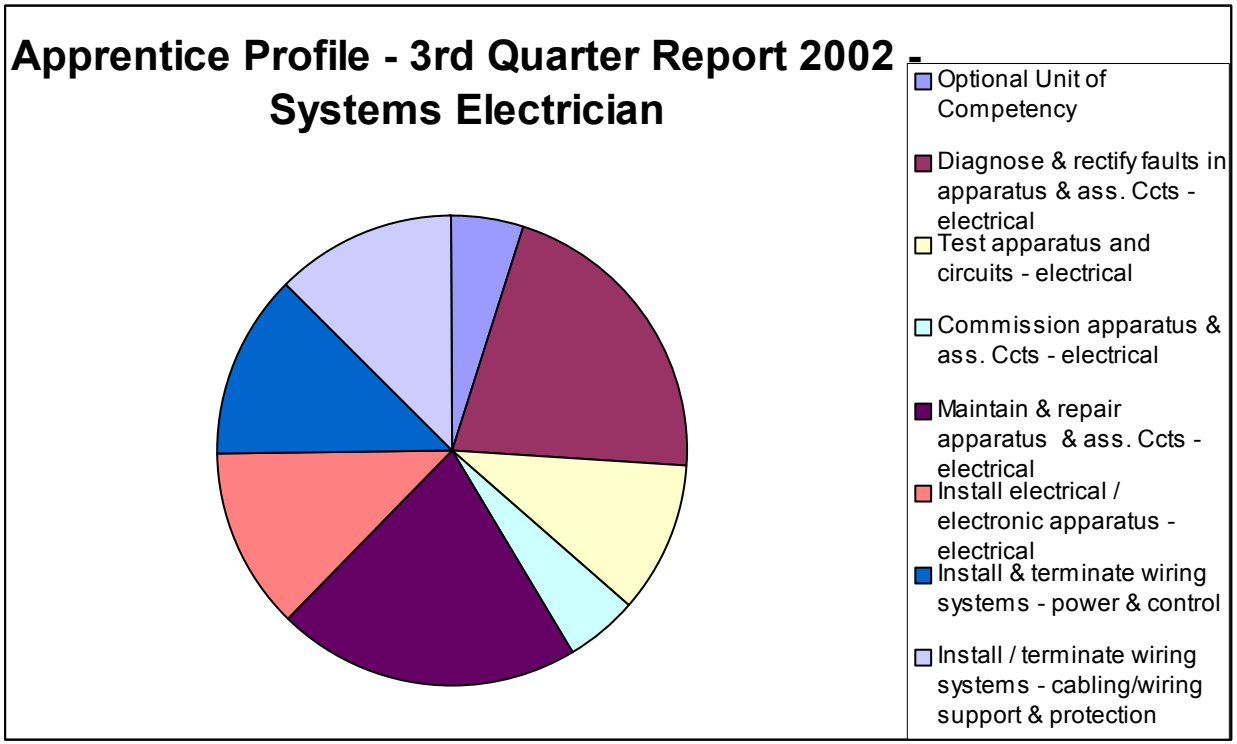
Pie charts can be generated for the following criteria for the learner / trainee report:

- Wiring System Types
- Power and Control - LV Cables
- Elements of Competency
- Apparatus/Equipment
- Level of Supervision
- Incidental Supporting Work

Bar Graph Report – Example



Pie Chart Report – Example



6.3 Work Experience Record Book Monitoring and Reporting

Learner / trainee's will need to submit their Work Experience Record Book once in each six (6) week period of the teaching semester for examination by the assessor i.e for learner / trainee group 1 - teaching week 1, 7 and 13; learner / trainee group 2 - teaching week 2, 8 and 14. The assessor will photocopy the last page of each unit for the record and may need to interview the learner / trainee on his/her entries in the Record Book at this reporting stage.

See Appendix B for Timetable of Reporting.

The Work Experience Record Book will be examine for the following criteria:

- Number of unit pages completed - is the number sufficient
- Unit of Competency pages signed by supervisor and learner / trainee
- Level of supervision - is this correct at this stage of training
- Range of variables in each unit - is the learner / trainee gaining experience across a board range of variables
- Range of units - is the learner / trainee gaining experience across all required for the qualification
- Accumulated totals - are the totals added correctly

Variations outside the standard profile will need to be reviewed and highlighted by the RTO assessor and explained by either the learner / trainee or the supervisor.

Notes:

7. Portfolio

MODULE PURPOSE

This topic introduces the learner / trainee to the portfolio method of reporting workplace experience evidence to the RTO Assessor.

Objectives - To Achieve The Purpose Of This Topic:

At the end of this topic the learner / trainee will be able to:

- List the various forms which may be used in the portfolio method of reporting workplace experience evidence.
- State the main points which the portfolio must address when reporting units of competency.
- Identify the units of competency which may be grouped together for reporting means.
- Outline the main points of an employer reference when used in the portfolio method of reporting.

Contents

7.1 Introduction

The portfolio method of reporting workplace evidence is a combination of documentation such as references and/or testimonials, formal project appraisals, work records, reports extracted from log books, job cards and/or any other evidence that is current and relevant to the competency sought. For the portfolio to meet the criteria required by the RTO Assessor, the evidence needs to be current, sufficient, authentic and valid.

7.2 Points to be Considered

- The portfolio needs to address all the units that make up the qualification i.e. core units, specialisation, elective units and, any optional units if chosen needs to address the three main elements of each unit - plan, carried out and completion.
- Number of occasions the learner / trainee perform each element of the unit under board supervision
- Range of variables for each unit i.e. equipment/apparatus, cables, tests, etc

7.3 Grouping of Units of Competency for Reporting

To reduce the paper work, some units would be suitable to be grouped together as the tasks undertaken on the job are similar and are normally part of the whole job.

The following grouping would be considered as suitable to report as one reporting:

Group 1

- Install and Terminate Wiring Systems- *cabling/wiring support and protection*
- Install and Terminate Wiring Systems - *power and control - low voltage*
- Install Electrical/Electronic Apparatus - *Electrical*
- Test Apparatus and Circuits - *Electrical*

Group 2

- Maintain and Repair Apparatus and Associated Circuits - *Electrical*
- Undertake Commissioning Procedures of Apparatus and Associated Circuits - *Electrical*
- Test Apparatus and Circuits - *Electrical*

Group 3

- Diagnose and Rectify Faults in Apparatus and Associated Circuits - *Electrical*
- Test Apparatus and Circuits - *Electrical*

Group 4

- Participate in the Training of Others
- Elective Units

7.4 Sample Portfolio Outline - Employer Reference

This is a statement that < *learner / trainee name*> has undertaken the following work while in the employment of <*employer name*>:

- Period of Work: *dates/duration*
- Location of Work: *addresses*
- Type of Work: installation/maintenance/commissioning/fault finding planning/carrying out/completion of jobs
- Type of Equipment/Apparatus/Cables/Tests/Etc
- Supervision Level:
- Name of Supervisor:
- Signature of Supervisor:
- Licence Number:

Notes:

8. Workplace Assessment

MODULE PURPOSE

This topic introduces the learner / trainee to the workplace assessment method of assessing workplace competency.

Objectives - To Achieve The Purpose Of This Topic:

At the end of this topic the learner / trainee will be able to:

- State the purpose of workplace assessment
- List the tools that workplace assessors may use
- Explain the process of workplace assessment.
- State the appeal procedures against the decision of a workplace assessment.

Contents

8.1 Introduction

This is a method where a qualified workplace assessor will carry out the assessment in your workplace to assess your competency. This can be a costly method as the workplace assessor is typically paid an hourly rate plus travelling time. The method is basically a, one to one ratio, where the assessor is assessing the individual.

8.2 Tools That the Workplace Assessor May Used

The workplace assessor would normally have standard tools to use in the assessment process, these tools could be:

- Notification of Assessment
- Supervision Report
- Soft Skills Report
- Technical Skills Report (one for each unit of competency)
- Learner / trainee Comment Form
- Report to RTO
- Notification of Assessment

Notification of Workplace Assessment

Candidates Name: _____ Employee ID_____

Assessors Name: _____Tel: _____

Qualification Title: _____Date of notification: / /

The workplace assessment will be carried out:

On the following units of competence		For the following reason	
Unit No.	**Unit Title**	**Progress**	**Final**

Location_____ Date: / / Time: _____

Information has already been taken into consideration, from the following sources:(tick)

1. Profiling Bar and Pie Graphs (if available) _____
2. Log Book Entries (if available) _____
3. Comments by _____(name) who is you mentor/supervisor_____
4. Off-the-Job Modules Completed to Date _____
5. Record of Previous Workplace Assessment(s) _____
6. Other (enter if required) _____

Additional information needs to be gathered: No or Yes (circle)

If No is circled then the workplace assessment processes can move to the analysis and decision phases. If Yes is circled then additional information will be collected about: **(tick)**

- Range of plant, equipment, components etc you have worked on/with _____

- Your ability to work safely and productively _____
- Your ability to follow instructions, deal with clients and work in teams _____
- Other [list] _____.

A Comment Form for you to complete, together with a copy of the **RTO Recommendation** Report will be forwarded to you after the event. If you require any additional information you should contact the assessor (above telephone number) or your nominated supervisor/mentor.

Name_____ Signature: _____

(Person issuing the notification)

Notes:

Appendix A – Diary Samples

Diary
Learner / Trainee under Direct Supervision – Servicing

Monday
Work with Jane the electrician. Replace limit switch and wiring in lift well.

Test 3 phase motor with megger and multimeter. Disconnected motor from supply. Found motor had low reading. Replaced motor with new motor from store.

Replaced broken GPO in fitters workshop with new one.

Fixed fluorescent light with new starters and tubes in carpenters workshop.

Tuesday
Helped pull apart large 3 phase motor- took bearings off rotor and replaced with new bearings.

Cleaned motor with electrical cleaner.

Watched Jane test motor with multimeter and megger – OK

Wednesday
Helped Jane wire new GPO in Pay office for new photocopier. GPO fitted to gyprock wall- wires came from switchboard. Jane turned off main power and connected wires into circuit breaker.

Tested GPO with megger and multimeter.

Turned on power and tested with test lamps – OK

Thursday
With Jane, changed the brushes on a large motor with commutator. Took out old brushes and blew dust out of motor.

Replaced old brushes with new ones and placed in brush holders.

Friday
Tech day - doing Electrical drawing and Applied Electricity 3.

Saturday/Sunday
Days off

Diary
Learner / Trainee under Direct Supervision – Installation

Monday
Helped boss rough in the wiring for a 3 bedroom house. 2 light circuits, 2 socket outlet circuits, 1 stove and 1 hot water system.

Helped boss to put underground mains to new house (2 storey - 4 bedroom). Underground mains in 40 mm orange conduit with 3 red wires and 1 black wire covered in white insulation.

Tuesday
With the boss, helped connect lights, socket outlets, stove and water heater and air conditioner (3 actives). Boss tested circuits using multimeter and megger.

Wednesday
Boss and I repaired hot water system - heater element broken.

Helped boss rough in 5 bedroom, 2 storey house - 3 lighting circuits, 3 socket outlet circuits, 1 stove, 1 hot water system, air conditioner (3 actives), underground wiring to pool area and outdoor garden lighting circuit.

Thursday
Tech day - doing Applied Electricity 2 and workshop.

Friday
Boss and I put in wiring for air conditioning unit - used 4 mm2 flat white cable with active, neutral and earth connected to 20 A outlet. Boss tested circuit with multimeter and megger.

Saturday/Sunday
Days off

Diary
Learner / Trainee under General Supervision – Servicing

Monday
Maintenance of power transformers - checked oil levels on breathers and replace silica gel crystals. Heated old silica gel crystals in oven to dry them out (to change back to a blue colour) and stored crystals in workshop store.

Tuesday
Disconnect large DC motor on overhead crane. Riggers brought motor to Electrical Workshop where both bearings were removed from armature and replaced with new bearings.

Cleaned motor with electrical cleaner and cleared up commutator with glass paper. Tested motor with multimeter and megger – OK

Wednesday
Tech day - doing Three Phase Induction Motors and Electrical Installation Protection Methods and Devices.

Thursday
Routine maintenance on 415 volt Air Circuit Breaker (ACB) - Isolated and racked out ACB from cubicle. Vacuum inside of ACB cubicle. and cleaned arc chutes and contacts.

Closed circuit breaker and checked contact resistance with Kelvin Bridge (14 -15 μΩ). Checked operation of circuit breaker tripping.

Checked measurements between main movable contacts and fixed contact. Placed ACB back into cubicle.

Friday
Emergency Diesel Fire Pump
- placed new battery to act as a standby battery for starting diesel engine.

-ran engine to charge new battery and check on battery condition - cell voltage = 2.3 volts, battery voltage = 13.8 volts, specific gravity = 1260 /cell. Engine running at 1500 RPM

Saturday/Sunday
Days off

Diary
Learner / Trainee under General Supervision – Installation

Monday
Roughing in the wiring for a block of 2 bedroom townhouses (6 townhouses). Each townhouse consists of 2 light circuits, 2 socket outlet circuits, 1 stove and 1 hot water system , 2 telephone outlets and 2 TV antenna outlets.

Tuesday
Installation of electrical wiring in new Italian Restaurant. Rough in lighting circuits (4), socket outlets (3), air conditioning (3 phase), telephone lines, speakers cabling and extraction fans for kitchen.

Wednesday
Tech day - doing Applied Electricity 5 and DC Machines.

Thursday
Supermarket - replaced fluorescent light fitting (twin 65 watts) - 72 fittings.

Friday
Fitted out Italian Restaurant - 24 low voltage down lights controlled by light dimmers, socket outlets, 7 kW 3 phase air conditioner, 3 phase extraction fans (3), low voltage surround sound speakers (8).

- help boss wired up switchboard

- tested all circuits with testlamps, multimeter and megger.

Saturday/Sunday
Days off

Diary
Learner / Trainee under Board Supervision – Servicing

Monday
Repair to fluorescent lights on boiler

- Found the lights had no supply (240 volts ac)

- Lights supplied by MIMS cable from switchboard, cable damaged at junction box to the first bank

- Replaced cable with new cable from switchboard and tested cable with multimeter and megger.

- 2 light fitting found to have burn out ballasts, replaced ballasts with new ones and checked light operation to be OK.

Tuesday
Installed new bench drill in Electrical Workshop - run 20 mm steel conduit from workshop switchboard to drill.

- Used 2.5 mm^2 TPI cable (3 phase, neutral and earth)

- Mounted 3 pole isolating switch and DOL motor starter next to the drill and wired switch and starter up.

- Tested drill circuit with multimeter and megger to ensure circuit OK

- Foreperson checked final job

Wednesday
Tech day - doing Power Supply Principles and Electrical Installation - Design and Equipment Selection.

Thursday
Overhead Crane - 12 month routine maintenance

- Checked thruster brakes, brake contactor panel, adjusted hoist brakes and checked connections, insulation resistance and oil levels.
Check lighting transformers input and output voltage (415 volt to 240 volts) and insulation resistance.

- Inspected trolley wires and collectors (brushes OK)

- Inspected the four motors - main hoist, long travel, cross travel and auxiliary hoist motor - check holding down bolts, insulation resistance, brush length, connections, sliprings (blew out brushgear and slipring housing)

Friday
Repaired 3 phase 415 volt sump pump
- Replaced holding down bolts with stainless steel bolts, replaced flexible lead and seal connection to motor with silicon

- Tested and test run motor in workshop - motor drawing 2 amps per phase.

- Replaced TOL with correct current range overload.

Saturday/Sunday
Days off

Diary
Learner / Trainee under Board Supervision – Installation

Monday

Thursday

Tuesday
Tech day - doing Applied Electricity 2 and workshop.

Friday

Wednesday

Saturday/Sunday
Days off

Diary
Learner / Trainee under Board Supervision – Servicing

Monday

Tuesday

Wednesday

Thursday
Conveyor belt motor (3 phase, 415 volt 150 HP) will not start - found 2 HRC fuses blown.. Tested motor with megger and found the resistance to earth to be 75 kΩ. Found the counter weight was jammed and the P&B Gold overload relay did not trip.

Replace motor, and readjust overload relay and set for instant over-current trip.

Friday

Saturday/Sunday
Days off

Notes: