1. Module details

Module name	**Domestic Appliance Equipment Safety**
Suggested structured learning time	A learner possessing the prerequisite skills and knowledge should achieve the module purpose in 18 to 20 hours.
Module code	NUE509
Field of Education code	031315

2. Module purpose

This module provides the criteria for attributing competence to a learner through the assessment of knowledge and skills critical to work associated with domestic appliance servicing in the capacity of installing, maintaining, repairing, fault finding, testing and commissioning as required by the National Electrotechnology Training Package. This includes "associated electrical work."

Learners will demonstrate the level of critical skills performance required to install, maintain, repair, fault find, test and commission domestic appliance equipment.

It covers working safely with refrigerants, gases and electricity, Acts and Regulations; appliance installation and testing; and protection methods and devices.

3. Learning pathway

Intended use in the structured learning program	This module IS intended to supplement extensive workplace exposure to domestic appliance servicing work. In particular it applies to the critical skills performance required to install, maintain, repair, fault find, test and commission domestic appliance equipment. Therefore before undertaking this module an apprentice should have a clear understanding experience and completion of all the relevant underpinning curriculum (equivalent to 23.5 full) modules in the Certificate III in Domestic Appliance Servicing.
Recommended prerequisites	For the most effective learning this module should be undertaken only after completion of all the relevant underpinning curriculum (equivalent to 23.5 full) modules in the Certificate III in Domestic Appliance Servicing.

4. Relationship to competency standards

This module provides part of the underpinning knowledge and skills in the 'Evidence Guide' of specific units of competency in the National Electrotechnology Training Package and provides similar support, where mapped, to equivalent units in the National Metals and Engineering Competency Standards. For details refer to the module to unit maps, available from EEQSBA.

5. Content

Summary of content

1. Working safely on domestic appliance equipment
- Knowledge
- Skills

2. Safe operation of domestic appliance equipment
- Knowledge
- Skills

3. Protection methods and devices
- Operation
- Knowledge
- Skills

6. Assessment strategy

Assessment methods

Assessment should be progressive reflecting a holistic approach to ensure the module is met. To assist in ensuring validity, reliability and fairness assessment instruments should include practical exercises, assignments and written tests consisting of item types, such as multiple choice, short answer and problem solving.

Conditions of assessment

Normally learning and assessment will take place in a formal learning environment.

7. Learning outcome details

Learning outcome 1

Demonstrate knowledge and skills for working safely with refrigerants, gases and electricity on domestic appliance equipment.

Assessment criteria

1.1 State the safety procedures to work on domestic appliance equipment, circuits and / or apparatus. This includes:

- relevant codes and regulations.
- handling and using of refrigerants.
- pressurise, evacuation, charging, leak detection, recovery.
- handling and using gases, for example oxygen, acetylene, dry nitrogen.
- handling and using refrigeration oils.
- electrical disconnect / reconnect and testing.

	1.2 Demonstrate safe working practices as a normal part of carrying out domestic appliance equipment installation, commissioning and service work (as listed above, integrated with other practical assessment activities).
Learning outcome 2	Demonstrate knowledge and skills for ensuring a domestic appliance is safe to use, including associated electrical equipment.
Assessment criteria	2.1 Demonstrate methods for ensuring domestic appliance equipment, circuits and apparatus are safe to use. This includes: • apply relevant codes, regulations, design conditions, specifications and drawings. • conduct mandatory tests. • Refrigeration: pressure, vacuum, leak, refrigerant charge, operation, compressor efficiency, etc. • Electrical: earth continuity, earth leakage, supply voltage and polarity, short circuit, operating current, etc. • identify non-compliance from test results. • locate/identify non-compliance faults. • make recommendations to rectify non-compliant faults. • complete mandatory documentation. 2.2 Apply the safety requirements when installing, commissioning or repairing domestic appliances.
Learning outcome 3	Demonstrate knowledge and skills for ensuring domestic appliance fault protection devices will operate as intended.
Assessment criteria	3.1 Explain the features and characteristics of electrical overload and fault protection systems. This includes: • operating principles fuses, circuit breakers and RCDs. • characteristics of fuses, circuit breakers and RCDs. • suitability of protection devices for a given situation.

3.2 Describe the main features/components of an MEN system and the purpose of each. This includes:

- supply neutral.
- MEN link.
- protecting earth conductor.
- main earth.
- earth electrode.
- the need to ensure continuity of the main neutral.

3.3 Explain the features and characteristics of domestic equipment overload and fault protection devices and systems.

3.4 Set and test the operation of domestic appliance fault protection devices and systems.

8. Delivery of the module

Delivery strategy

Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective method to achieve this is by integration of theory and practice where students learn by experimentation, research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require a learning outcome sequence other than that indicated in the module.

Resource requirements

Resources should be sufficient for students to carry out exercises on an individual basis.

Useful references include:

Boyle, G. *Australian Refrigeration and Air Conditioning*, Volumes 1& 2, WA Trust Publications.

Dossat, R.J., *Principles of Refrigeration*, SI Version

Jenneson, J. R. 1995, *Electrical Principles for Electrical Trades*, McGraw Hill, Sydney

Olivio, C.T., *Principles of Refrigeration*, 3rd Edition

Relevant Commonwealth and State Acts and Regulations.

	Standards Australia, Standards New Zealand: HB40 (Latest Edition) *The Australian Refrigeration and Air-conditioning Code of Good Practice Reduction of Emissions of Fluorocarbon Refrigerants.* AS1677 (Latest Edition) *Refrigerating Systems* AS/NZS 3760 (Latest edition*) In-service Safety Inspection and Testing of Electrical Equipment* AS/NZS 4836 (Latest edition) *Safe Working Practice on Low-voltage Electrical Installations* WorkCover NSW, *WorkCover Code of Practice - Low Voltage Electrical Work Local electricity distributor and authority regulations* Where this module is used in an approved Traineeship or Apprenticeship program learners should be advised to obtain, where available, respective EE-Oz Training Standards[1] ***User Guides*** (*these outline in detail what training and work performance the Learner is required to undertake for the program*).
Occupational health and safety requirements	A safe and healthy environment will be provided for learners and teachers. Safety procedures for the particular learning facilities shall be followed as part of the learning / teaching activity and assessment.

[1] EE-Oz Training Standards – ElectroComms and EnergyUtilities Industry Skills Council Ltd formally EEQSBA