Australian Government

AURESA001 Work safely around electric vehicles and rechargeable energy storage systems

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Release: 1

AURESA001 Work safely around electric vehicles and rechargeable energy storage systems

Modification History

Release	Comments
1	This unit of competency was first released in AUR Automotive Retail, Service and Repair Training Package Release 11.0.

Unit outcomes

This unit describes the skills and knowledge required to work safely in an environment where electric vehicles (EVs), rechargeable energy storage systems (RESS) and charging equipment are present. RESS are the battery systems that store electrical energy to power the vehicle.

It applies to workers in automotive retail, automotive manufacturing, mining, agriculture, motorsport, transport and logistics, passenger transport, vehicle recovery, battery recycling and other relevant industries, including individuals who are not qualified or authorised to work on EVs or RESS. It covers identifying EVs, RESS and charging equipment, recognising hazards, maintaining safe distances, raising the alarm, and reporting and escalating hazards, according to workplace procedures or other relevant procedures.

Authorised personnel are people the employer has approved to work on EVs, RESS or charging equipment, based on their training and competency and any licensing requirements of the relevant state or territory.

This unit does not cover isolating, depowering, testing, diagnosing, repairing or dismantling EVs, RESS and charging equipment, or emergency response, including firefighting, beyond raising the alarm, evacuating and contacting emergency services.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Knowledge

- types of EVs, including battery electric, plug-in hybrid, hybrid and fuel cell electric vehicles
- features used to identify EVs and hazardous voltage components, including orange cabling, warning labels, vehicle markers and EV symbols on the dashboard, and the limits of external markers, which may be missing

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- basic concepts of voltage and current, and why hazardous voltage in EVs and RESS presents a greater risk than the starter battery in a conventional vehicle
- stored energy and hazardous voltage in RESS and other components, and why EVs and RESS can remain hazardous when switched off or damaged
- types of charging equipment, including portable charging leads, and wall-mounted and free-standing charging units
- using charging equipment only as the manufacturer intends, including not using extension leads or adaptors unless the manufacturer approves them
- reasons an EV should not be connected to charging equipment
- signs of damaged or faulty charging equipment and cabling
- EV and RESS hazards, including:
    - silent operation and unexpected vehicle movement
    - electric shock and arc flash
    - thermal runaway, fire and reignition
    - toxic smoke, and toxic or flammable gas release, including off-gassing from a damaged RESS
    - electrolyte leaks, including skin and eye contact
    - environmental contamination, including from electrolyte leaks
    - storing or transporting RESS and damaged EVs
    - hydrogen leaks and fire in fuel cell electric vehicles
- signs of RESS damage that may cause thermal runaway, including sight, sound and smell indicators, vehicle warning messages and unusual heat
- differences between EV or RESS warning signs and other vehicle faults and warnings
- the need to treat an uncertain situation as a hazard and refer it to authorised personnel
- situations that can damage or compromise an EV or RESS and make it unsafe, including collision, environmental conditions, water immersion, fire exposure and internal faults
- safe distances, exclusion zones and access restrictions specified in workplace procedures or manufacturer instructions, including for areas where EVs are charging or being depowered, maintained or repaired, and where RESS are stored
- the need to follow directions from authorised personnel in these areas
- workplace controls and safe distances as the main protection, and limitations of personal protective equipment (PPE) as the last line of defence against hazardous voltage, thermal hazards and arc flash
- equipment, tags, signage and barriers specific to EVs and hazardous voltage, including those described in AS 5732 Electric vehicle operations - Maintenance and repair

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- limits of own role when EV or RESS hazards are identified, including who the authorised personnel are in the workplace, tasks only they can carry out, the duty to report and withdraw rather than intervene, and the consequences of working outside own role
- tasks that must only be carried out by authorised personnel, including isolating, depowering, testing, repairing and emergency response
- actions that must not be taken without authorisation, including:
    - touching or disturbing orange cabling or exposed hazardous voltage components, including during routine tasks such as topping up fluids under the bonnet
    - opening or dismantling RESS, removing covers or disconnecting cables
    - electrical testing or depowering
    - moving a RESS, or an EV that is damaged, charging, tagged or under repair
- why workers must not fight EV or RESS fires, and workplace policy on using fire equipment on other fires
- workplace procedures for reporting and escalating hazards, raising the alarm, evacuating and contacting emergency services
- actions to maintain safe distances from a hazard or follow evacuation procedures until authorised personnel or emergency services take control, including in remote locations where help may be delayed
- role of emergency services and authorised personnel in responding to EV and RESS incidents
- information to provide emergency services and authorised personnel about EV and RESS hazards, including time first noticed, type of hazard, location, people involved or at risk, and EV details if known
- sources of EV safety information, including manufacturer instructions and emergency response guides
- own work health and safety (WHS) duties relating to EV and RESS hazards
- environmental requirements relating to EV and RESS incidents, including reporting electrolyte spills and environmental contamination
- workplace incident, near-miss and hazard reporting requirements.

Skills

- identify EVs, RESS and charging equipment in the work area using vehicle features and indicators, labels, tags and signage
- recognise signs of RESS damage that may cause thermal runaway, including vehicle warning messages
- recognise signs of damaged or faulty charging equipment and cabling

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- treat an uncertain situation as a hazard
- recognise when a situation is outside own role and refer it to authorised personnel
- stop work, maintain a safe distance from the hazard and keep others clear, following workplace procedures or directions from emergency services
- follow directions from authorised personnel and observe barriers, signage and exclusion zones
- report all hazards clearly and promptly to supervisors, authorised personnel or emergency services
- raise the alarm and follow evacuation procedures when a hazard escalates
- monitor the hazard from a safe distance until authorised personnel or emergency services take control
- help complete incident, near-miss or hazard reports according to employer reporting requirements.

Application of Knowledge & Skills

This unit applies to workers who are not qualified or authorised to work on EVs, RESS or charging equipment. They work alone or under supervision, following workplace procedures or directions from emergency services. They are responsible for recognising hazards, stopping work, maintaining a safe distance and keeping others clear, raising the alarm, and reporting and escalating the hazard. They are accountable for working within the limits of their role and referring technical tasks to authorised personnel. They do not make technical decisions about, or work on, EV or RESS hazardous voltage systems.

Pre-requisite unit(s)

No pre-requisite units

Competency field(s)

Technical - Hybrid Vehicle and Battery Electric Vehicle

Unit sector(s)

Work Health & Safety

Foundation skills

- Reading - interpreting hazard signage, warning labels, tags, vehicle warning messages and workplace procedures
- Writing - recording basic hazard details in the employer’s reporting format, either electronically or with assistance

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- Oral communication - reporting hazards clearly, escalating concerns promptly and giving information to emergency services, including under time pressure
- Problem-solving - treating an uncertain situation as a hazard, and recognising when a situation is outside own role and referring it to authorised personnel

Range of conditions

Hazard situations involving an EV or RESS may include:

- collision damage
- water immersion or exposure
- exposure to external fire
- thermal event or off-gassing
- internal battery or electrical fault, indicated by vehicle warning messages

Charging environments may include:

- home and workplace charging areas
- public charging areas
- depot and fleet charging areas

EVs and equipment fitted with RESS may include:

- light vehicles
- heavy vehicles
- motorcycles and all-terrain vehicles (ATVs)
- mobile plant, including forklifts, elevated work platforms and earthmoving equipment
- agricultural machinery
- caravans, trailers and other towed equipment fitted with RESS or electric axles

Work conditions may include:

- remote or isolated locations where emergency services or authorised personnel may be delayed
- public locations outside a workplace
- enclosed or underground areas
- environmental conditions, including extreme heat, dust, flooding and bushfire

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Assessment Requirements for AURESA001 Work safely around electric vehicles and rechargeable energy storage systems

Performance Evidence

An individual must demonstrate the ability to apply the skills and knowledge described in this unit in at least two different workplace situations relevant to the individual's job role, across one or more work environments: one involving an EV or RESS that is damaged or compromised, and one involving damaged or faulty charging equipment or cabling. For each situation, the individual must:

- identify the EV, RESS or charging equipment involved, including the EV type, and any vehicle indicators, workplace tags or signage
- recognise and describe the hazard signs present, including any vehicle warning messages, and treat any uncertainty as a hazard
- stop work, maintain a safe distance and keep others clear according to workplace procedures
- follow directions from authorised personnel and observe barriers, signage and exclusion zones
- recognise which actions are outside own role and refer them to authorised personnel
- identify actions that must not be taken, including attempting to put out an EV or RESS fire, and moving an EV that is damaged, charging, tagged or under repair without authorisation
- report the hazard to a supervisor, authorised personnel or emergency services according to workplace procedures
- help complete an incident, near-miss or hazard report according to employer reporting requirements.

Knowledge Evidence

An individual must be able to demonstrate the knowledge required to complete the tasks outlined in this unit, including:

- types of EVs, RESS and charging equipment
- features, vehicle indicators, labels, tags and signage used to identify EVs, RESS and charging equipment, and the limits of external markers
- basic concepts of voltage and current, and the risks of hazardous voltage and current
- safe use of charging equipment, including not using extension leads or adaptors unless the manufacturer approves them
- reasons an EV should not be connected to charging equipment
- EV and RESS hazards, including:
    - silent operation and unexpected vehicle movement

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    - hazardous voltage and stored energy in RESS and other components, including in EVs and RESS that are switched off or damaged
    - electric shock and arc flash
    - thermal runaway, fire and reignition
    - toxic smoke, and toxic or flammable gas release, including off-gassing from a damaged RESS
    - electrolyte leaks
    - environmental contamination
    - storing or transporting RESS and damaged EVs
    - hydrogen leaks and fire in fuel cell electric vehicles
- signs of EV, RESS and charging equipment hazards, including:
    - impact damage
    - RESS damage that may cause thermal runaway, including sight, sound and smell indicators
    - damaged or faulty charging equipment and cabling
    - vehicle warning messages and unusual heat
- situations that can damage or compromise an EV or RESS and make it unsafe
- differences between EV or RESS warning signs and other vehicle faults and warnings
- the need to treat an uncertain situation as a hazard and refer it to authorised personnel
- safe distances, exclusion zones and access restrictions specified in workplace procedures or manufacturer instructions, including for areas where EVs are charging or being depowered, maintained or repaired, and where RESS are stored
- following directions from authorised personnel in these areas
- workplace controls and safe distances as the main protection, and limitations of PPE as the last line of defence against hazardous voltage, thermal hazards and arc flash
- equipment, tags, signage and barriers specific to EVs and hazardous voltage
- limits of own role
- who the authorised personnel are in the workplace
- tasks that must only be carried out by authorised personnel, including isolating, depowering, testing, repairing and emergency response
- actions that must not be taken without authorisation, including touching or disturbing orange cabling or hazardous voltage components, opening RESS or removing covers, and moving a RESS or an EV that is damaged, charging, tagged or under repair
- reasons workers must not fight EV or RESS fires, and workplace policy on using fire equipment on other fires
- the duty to report and withdraw rather than intervene

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- consequences of working outside own role
- workplace procedures for reporting and escalating hazards, raising the alarm, evacuating and contacting emergency services
- actions to maintain safe distances from a hazard or follow evacuation procedures until authorised personnel or emergency services take control, including in remote locations
- role of emergency services and authorised personnel in responding to EV and RESS incidents
- information to provide when reporting an EV or RESS hazard, including time first noticed, type of hazard, location, people involved or at risk, and EV details if known
- sources of EV safety information, including manufacturer instructions and emergency response guides
- own WHS duties relating to EV and RESS hazards
- environmental requirements relating to EV and RESS incidents, including reporting electrolyte spills
- workplace hazard, incident and near-miss reporting requirements.

Assessment Conditions

Assessment must occur in a safe environment and must not expose individuals to live hazardous voltage components, fire or damaged RESS. Hazard indicators, including damage, smoke, leaks and warning signs, must be simulated using props, imagery, video or role-play. Damaged charging equipment and cabling may be used if disconnected from supply.

Assessment must include direct observation of the individual responding to each situation.

The following resources must be made available:

- EVs, RESS and charging equipment, or accurate representations of them, displaying identification features, vehicle indicators, labels, tags and signage
- barriers and signage used to mark exclusion zones
- emergency response guides or manufacturer safety information for EVs
- workplace procedures for hazard reporting and evacuation, or accurate representations of them
- incident, near-miss and hazard reporting documentation or systems used by the employer, or accurate representations of them.

Mandatory Workplace Requirements

Assessment of performance evidence may be in a workplace setting or an environment that accurately represents a real workplace.

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Unit Mapping Information

Previous Code and Title	Equivalence	Comments
	Newly created	This unit has been created to address a skill or task required by industry that is not covered by an existing unit of competency

Links

Companion volumes, including implementation guides, are found on the national training register - https://training.gov.au/training/details/AUR.

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