

Endeavour Energy Public Safety Plan FY24

Electrical & Public Safety



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1.0 INTRODUCTION

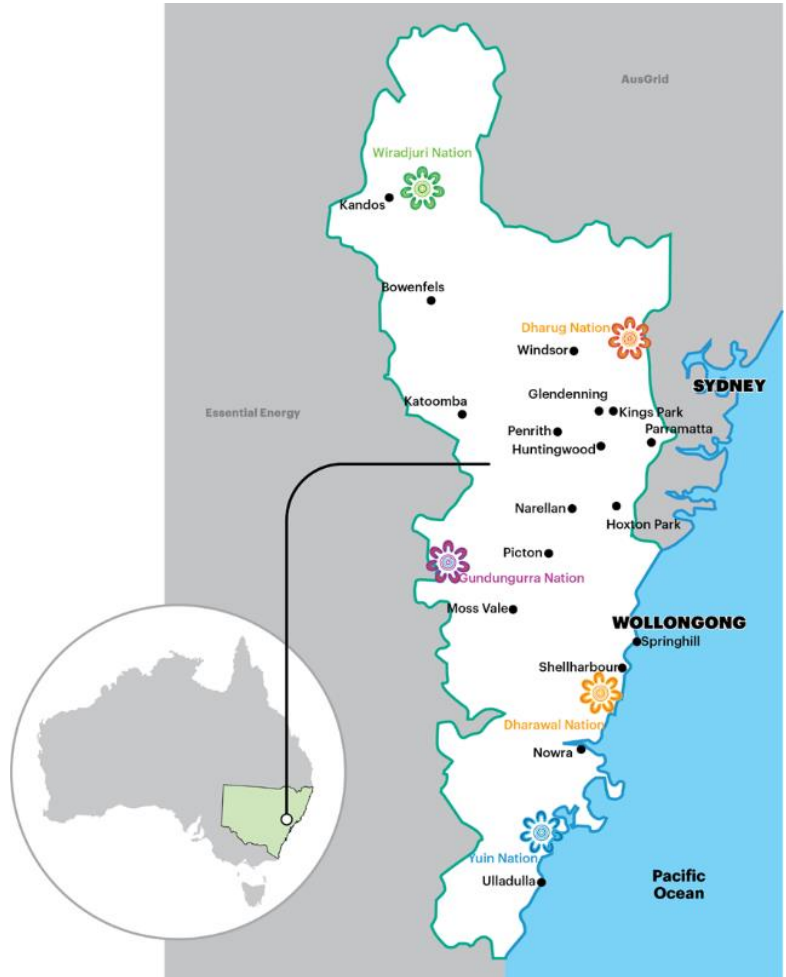
1.1 Background

Operation of the electricity distribution network over an area of almost 25,000 square kilometres results in risks to the public, either through their exposure to network assets in ways that are difficult to control or through our activities associated with the operation and maintenance of the network.

Our network is made up of more than 185 major substations, 416,000 power poles and 32,000 smaller substations connected by 47,000 kms (more than the distance from Sydney to London and back) of underground and overhead cables.

Endeavour Energy services the high growth regions of NSW, with the population of Greater Western Sydney forecast to grow approximately by almost one million people by 2031.

Our franchise area includes the Northwest and Southwest priority growth areas of Sydney which will see 500,000 new residents over 30 years.



These priority growth areas are the result of the biggest coordinated land release in NSW's history.

The management of the risk to public safety posed by the Endeavour Energy network has elements associated with both the management of the network assets and the ability of the company to influence the behaviour of the public in the vicinity of the network.

Under the Electricity Supply (Safety and Network Management) Regulation 2014 (the Regulation) Endeavour Energy must, as part of its Electricity Network Safety Management System, provide advice to the public about the hazards associated with its electricity network.

Endeavour Energy has developed and published this Public Safety Network Management Plan (Plan) to comply with this requirement and inform stakeholders of the associated hazards and controls in place to manage the inherent risks.

Endeavour Energy split (Safety) BR1.8 Harm to Member of the Public into two risks / hazardous events:

1) BR 1.8 Harm to member of the public excluding impacts with roadside assets

The risk that the network or activities associated with the construction, maintenance and operation of the network could result in harm to members of the public (including general public workers), as well as damaging property; and

2) BR 1.10 Member of public impact with a roadside asset

The risk that network roadside assets could result in harm to members of the public (including general public workers), as well as damaging property, in the event of a collision or asset failure.

1.2 Purpose

This Plan details how Endeavour Energy will invest and tailor activities to target at risk groups through safety awareness campaigns, educational programs, asset management programs, business processes and promote safe behaviours to reduce interaction with electricity infrastructure.

The Plan has been designed to:

- raise awareness of electricity safety and the risks associated with the distribution and use of electricity;
- raise awareness of electrical safety amongst at-risk target groups;
- remind the public of hazardous situations involving electricity; and
- demonstrate Endeavour Energy's commitment to the safety of its community.

1.3 Risk identification analysis and incident data

This Plan has been developed using data and risk analysis completed as part of Endeavour Energy's Public Safety Formal Safety Assessment (FSA).

The FSA uses the following data to inform the risk profile and determine at-risk groups:

- Safety incident and hazard data;
- Asset performance data;
- Industry (Australian and international) incidents, trends, and potential emerging risks;
- Insurance claims data;
- Internal audit findings;
- SafeWork NSW and IPART incident data; and
- Regulatory obligations.

The Plan is reviewed in line with the review cycle of the FSA and where emerging risks and opportunities for improvement are identified (both proactively and reactively).

1.4 Monitoring and performance

Overall monitoring of the company's risk position with respect to public safety risks is monitored through the oversight provided by both the Executive and Board Audit and Risk committees, as defined in the risk management policy and procedure.

These committees review both the key risk indicators (KRIs) and the progress on the implementation of risk treatment action plans to ensure that the desired outcomes are being achieved.

The key risk indicators used to monitor public safety risks include:

- Asset Strikes resulting from interaction with a member of the public (both overhead conductors and underground cables); and
- Domestic shocks resulting from network failure.

2.0 Approach to Managing Identified Public Safety Risks

Each person in our distribution network area relies on safely distributed electricity to power their lives at home, in the workplace and in the community.

Under normal operating conditions, electricity is safe when used correctly, however Endeavour Energy has identified the following at-risk groups and situations that could present a danger to our community:

- Storms, bushfires, floods and other natural disasters;
- Domestic electric shocks and tingles;
- Construction activity and general plant movement near the electricity network;
- Motor vehicle incidents; and
- Vandalism and unauthorised access (intentional and unintentional).

Endeavour Energy's plan to managing public safety risks associated with our network include activities grouped across four enablers:

1. **Asset Management** – Projects, programs and other activities across the network related to the asset lifecycle that ensure the network is safe;
2. **Technology** - Initiatives based on Smart Meters and their capability to function as both a preventive and mitigative risk control for network neutral issues, in addition to other technological advancements that relate to public safety outcomes;
3. **Worker Competency and Capability** - Activities that address the training, competency management and skill retention or development of our workers; and
4. **Public Awareness and Community Engagement** - Activities to raise our customer and stakeholder awareness of the hazards associated with electricity and our network.

Each enabler has associated activities/programs aimed at mitigating the risks to public safety.

Endeavour Energy's approach to managing public safety risks associated with our network is to take a data driven approach to understanding:

- Deficiencies in the design or condition of the asset that may pose public safety risks;
- The groups of members of the public who, because of the activities that they undertake, or other defined characteristics of the group, are at elevated risk of harm from our network; and
- The typical issues associated with the interaction of members of the public and the network that give rise to an increased risk of harm to the public.

2.1 Asset Management

Endeavour Energy's network design and construction standards are intended to manage a range of network safety and performance risks including the risk of contact with our assets by members of the public that results in harm.

Over the course of the asset's life, asset condition degrades, and environmental conditions can alter, leading to a higher likelihood of harm to the public. Risks that have been identified and have management plans in place include:

- Customer shocks (caused by our network);
- Unauthorised access to network assets (padmount substations);
- Asset strikes;
- Low mains; and
- Third party impacts (inappropriately placed assets)

Our Asset Management System considers these risks in our asset inspection and maintenance regime and implements capital and operating programs to manage them.

2.1.1 Monitoring Concentric Neutral Solid Aluminium Conductor (CONSAC) cable for compromised neutral

CONSAC cables in service in Endeavour Energy's Low Voltage (LV) Network are 3-phase underground conductors installed up to 1981. These conductors span a total of approximately 700km.

This cable can suffer from several failure modes, the most prominent mode being the failure of the concentric neutral conductor due to moisture ingress.

The principal risk presented by the CONSAC neutral failure is shock hazards to the public and workers, and as a result, a program to replace CONSAC cable in a planned manner has been in place since 2002.

As at FY23, approximately ~245km of the CONSAC in our network has been replaced, leaving approximately ~455km of CONSAC in service.



Since FY20, replacement of remaining CONSAC cable has been prioritised utilising data gathered by condition monitoring equipment (Neutral Integrity Meters) installed in FY19 on approx. 90% of distribution feeders with CONSAC cable.

Neutral Integrity (NI) Meters are revenue class meters that are installed on customer switchboards at the ends of LV distribution feeders with CONSAC cable. They provide data which can be used for monitoring of the neutral connections and conductors' condition.

The CONSAC cable replacement program is a long-term initiative that continues to be strategically informed by real-time cable condition monitoring to evaluate the status of the cable's electrical neutral connectivity and anticipate potential issues that may arise. This approach enables the program to address short-term risks while also deferring the replacement of healthy cables, resulting in superior prioritization.

The cable condition monitoring enables strategic prioritisation of replacement activities aimed at repairing or replacing faulty connections that have the potential to cause public shocks and other reliability related issues.

2.1.2 Asset Inspections (columns & pillars)

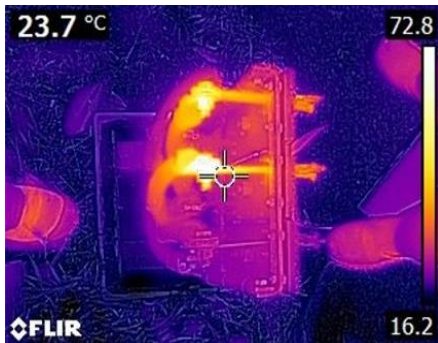
LV terminations are contained within mains and service pillars and within streetlight columns. Endeavour Energy distribution network has approximately 190,000 LV terminations.

The principal risk presented by the LV neutral termination failure is shock hazards to the public and workers.

The terminations and contacting connections of street light columns and LV pillars are required to be tested periodically to monitor for their deterioration or failures that may have occurred as a result of an event or impact



Routine external inspection of LV terminations in LV pillars and streetlight columns include external thermal inspection using infra-red camera (conducted every 4 years).



Internal visual inspections are carried out on an ad-hoc basis if:

- Thermal scans identified overheated connections or
- Any other circumstance where column cover or pillar lid is removed.

LV termination defects are recorded, and their rectification attempted on-site. If the defects cannot be rectified on site, they must be raised and prioritised as per the results of thermal scans or visual signs of heat damage.

2.1.3 Service Mains Replacement program

A Service main is either an overhead (OH) conductor or underground (UG) cable connecting the supplier's distribution mains to the consumer's premises (point of connection).

There are approximately 550,000 OH service mains which are currently installed in Endeavour Energy franchise area.

The two principal issues affecting overhead service mains are:

- Failures of the connectors at the point of attachment and
- The loss of insulation, both at the point of attachment and on the mains themselves.



Failed connectors result in fluctuating voltages and/or loss of supply to the installation but of particular concern is the loss of the neutral connection which can lead to electrical shock hazards in the installation. Deterioration of insulation, which results in bare conductors and connectors, presents a further risk of electrical shock hazard for the customer and their workers.

As condition data becomes available from the neutral integrity function of smart meters being installed throughout the network, the service mains replacement program will include planned reactive replacements based on condition.

The Service Mains Replacement (SMR) program continues as a reactive program that replaces defective customer service mains

As of FY23, Endeavour Energy has replaced or rectified approximately 187,000 overhead (OH) service mains.

2.1.4 Low Mains Remediation program



Overhead conductors are designed and constructed at a sufficient height to prevent contact, however if the ground is built up (for example, by road works), or poles lean over time, the minimum safe height can be breached.

This can lead to low mains over roadways or land presenting a heightened level of risk to motorists, which Endeavour Energy's systems record as a 'high load impact'.

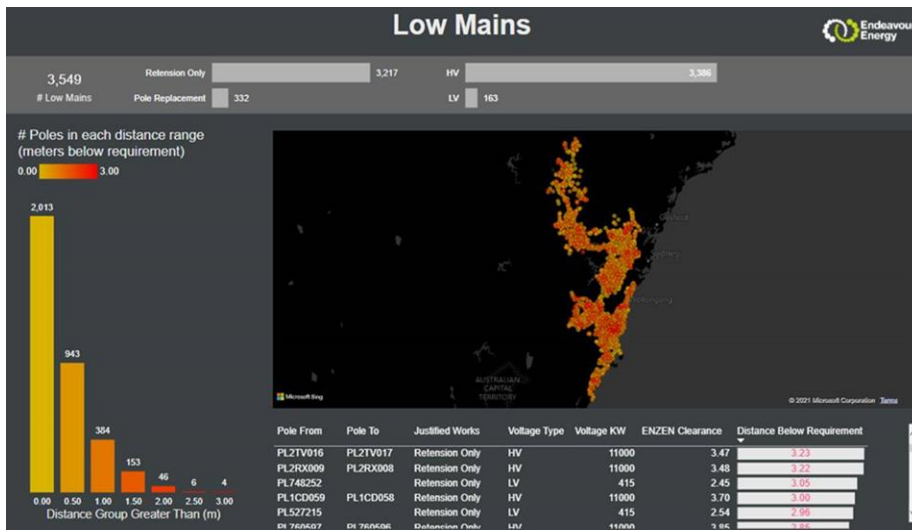
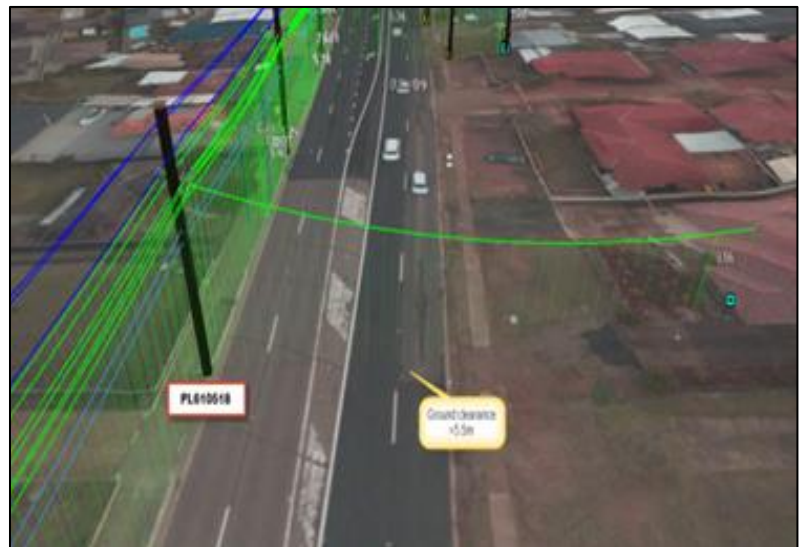
Maintenance activities to manage this include proactively identifying low mains locations through inspection activities, straightening poles, and re-tensioning conductors to increase clearances.

Additionally, the 'low mains remediation program' is an ongoing capital investment program to install additional or taller poles in situations where minimum height clearances cannot be achieved by other means.

In 2018, Endeavour Energy engaged ENZEN to perform a LIDAR (vehicle mounted light based radar technology) measurement of its entire network and build a 3D model of its network.

From this model, a report about the clearances from the network to the ground was able to be determined.

A low mains strategy was developed by the Asset Strategy & Planning branch and approved by the ENSMS Committee in April 2021 detailing a risk-based approach to managing the identified defects and cost justification.



The 'Low Mains' Strategy has a risk-based approach to managing the identified defects based on cost justification.

Over time, low mains may be addressed by other planned major construction and/or refurbishment projects.

The identified defects will be assessed within 3 years (FY23 - FY25) and all economically justified construction works will be completed within 5 years (by FY27).

2.1.5 Vegetation Management

With over 33,000 kilometres of underground and overground cables, an important part of maintaining our network is the management of trees and other vegetation near power lines.

Vegetation management is primarily a control for network resilience and prevention of power supply disruptions.

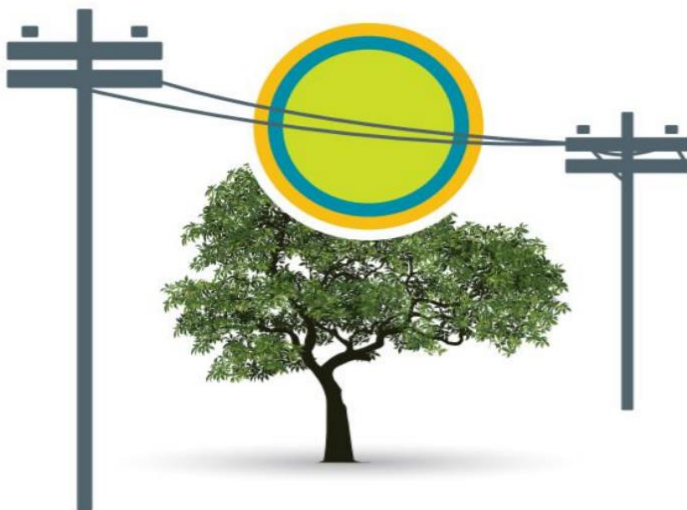
However, it also does have a significant positive impact on public safety outcomes through reduction of fallen powerlines and other connection related issues.

Our [Tree Management Plan](#) defines our approach to managing vegetation near our network in accordance with the Electricity Supply (Safety and Network Management) Regulation 2014.



This plan provides an overview of our responsibilities, tree pruning techniques, defines our policy on tree removal, and provides guidance on planting near network assets.

To execute this plan, we employ the services of trained horticulturalists, arborists and tree trimmers as part of a carefully managed twelve month cycle to continue to deliver customers a safe and reliable electricity supply.



While trimming can look severe at first, trees re-grow at a normal rate. Trimming may avoid the need to remove trees near powerlines entirely.

Vegetation management has the potential to impact on natural and cultural heritage features including aboriginal sites, non-aboriginal historic structures and relics, memorial gardens, parks, and protected or heritage listed trees.

We evaluate potential impacts before undertaking any pruning work. In some cases, alternative pruning cycles or technical options may be considered.

For further information regarding vegetation management and responsibility for vegetation on private property, please visit our website:

<https://www.endeavourenergy.com.au/safety/vegetation-management>

2.1.6 Public Lighting

Endeavour Energy operates and maintains more than 200,000 street lights across our network area on behalf of local councils, Transport for NSW and other utilities.

We recognise that lighting residential streets, main roads, pedestrian crossings and pathways helps to keep pedestrians and motorists safe during times of inadequate natural light.



Under the terms of the NSW Public Lighting Code, Endeavour Energy has developed a Public Lighting Management Plan to help maintain and improve public lighting services.

It illustrates how we manage and operate a safe and reliable public lighting network and details our commitment for further improvements in service levels and their related management strategies.

Between our scheduled maintenance, customers can play an important role in reporting street lights that are not working correctly.

Faulty street lights can be reported by calling us on 131 003.

Streetlight faults are maintained and repaired as per the NSW Public Lighting Code and reported quarterly.



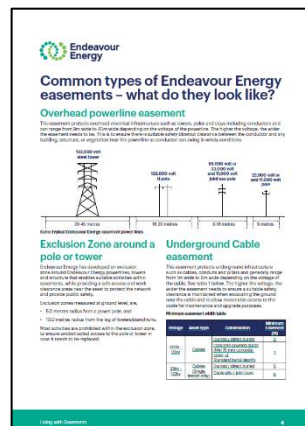
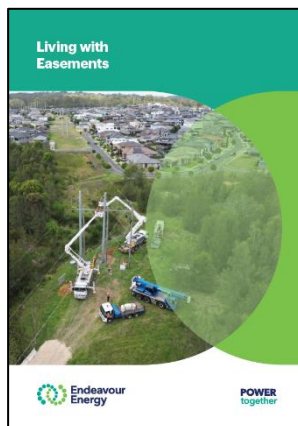
2.1.7 Vandalism Prevention and Asset Security

Unauthorised access to and vandalism of network assets poses a safety risk for the offending individuals, Endeavour Energy workers and the community. Damage to our equipment can hinder emergency response efforts, and damage to fencing surrounding our equipment can facilitate unauthorised access to our equipment by children and other vulnerable groups, exposing these individuals to safety risk also.

Theft and vandalism not only impact on safety but have a major impact on the reliability of power supply, with significant financial impacts for our customers. To address this issue, Endeavour Energy promotes reporting of hazards and graffiti through its website, contact centre and social media platforms. Reports are assessed based on risk and potential impact on the network and appropriate actions are taken to mitigate the risks.

Endeavour Energy's construction standards consider the possibility of unauthorised access and implement appropriate mitigating controls while minimising the impact on asset function. Additionally, the company conduct periodic inspections to identify occurrences of vandalism and unauthorised access to depots and substations. All fenced locations, kiosk and pillars provide warning information to the community of the hazards associated with the equipment and unauthorised access.

Endeavour Energy provide technical information and user friendly resources and brochures on its website to inform members of the public and landowners of the risks associated with electrical infrastructure and living in proximity to our easements.



Endeavour Energy assets are predominately located in the public domain, including approximately 14,500 padmount substations, of which more than 98% are fibreglass cubicles.

The cubicle doors that provide access to the high and low voltage switchgear in these substations and their locking mechanisms can be defeated by members of the public with the intent of causing a nuisance or attempting to steal copper. This can result in the exposure of live equipment that can be accessed by the public, presenting a significant safety hazard.

Endeavour Energy continue to explore security improvements through retrofit initiatives to existing assets in high risk locations and improved asset design for future enclosures and apparatus.

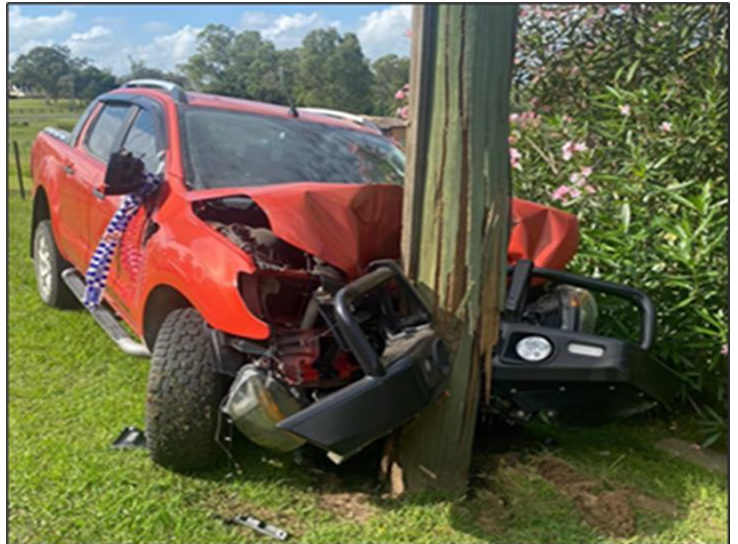
The company has also taken a proactive approach when it comes to community engagement concerning pad mount vandalisms. There have been numerous public awareness campaigns that go out to the public with effective response and guidance on what to do if they see an unauthorised access attempt.

2.1.8 Traffic Blackspot program

Endeavour Energy has a public safety program established to address identified locations where multiple traffic incidents involving roadside electricity assets have occurred.

The program uses the term 'black spot' as in some cases it carries out work in conjunction with Transport for NSW (Tens) black spot rectification projects.

Endeavour Energy maintain approximately 430,000 poles and respond to numerous vehicle impacts to our assets every year.



With the assistance of crash site data provided by tens, Endeavour Energy has developed a relocation program for black spot poles. The program includes:

- A specific set of criteria to identify poles that are considered high-risk based on predetermined risk factors;
- An established methodology to strategically identify assets for inclusion in the program; and
- A risk-based approach to determine the cost benefit ratio to ensure that resources are utilised efficiently, while also meeting any proposed case for investment.

To complement the reactive response to crash site data and to better serve the best interests of the community, a proactive option has been initiated which will be progressively implemented over the course of time.

This will be achieved via Endeavour Energy's routine pole inspection program to gather more informative data to assist future relocation programs such as special data, environmental factors and additional site specific assessment.

Over a 5.5 year cycle, each of the approximately 430,000 poles within Endeavour Energy's franchise will be routinely inspected and include two additional checks to drive proactive data gathering:

- The distance from existing poles and curb side – where <math><300\text{mm}</math> is measured the pole will be flagged and form a new data set for further assessment in accordance with existing Black Spot methodology (in the absence of the cost of injury, assumptions will be required); and
- The asset inspector will make a subjective assessment of the pole and potential vehicle obstruction risk based on the site conditions and any visible damage to the asset (this will inform the assumption made above).

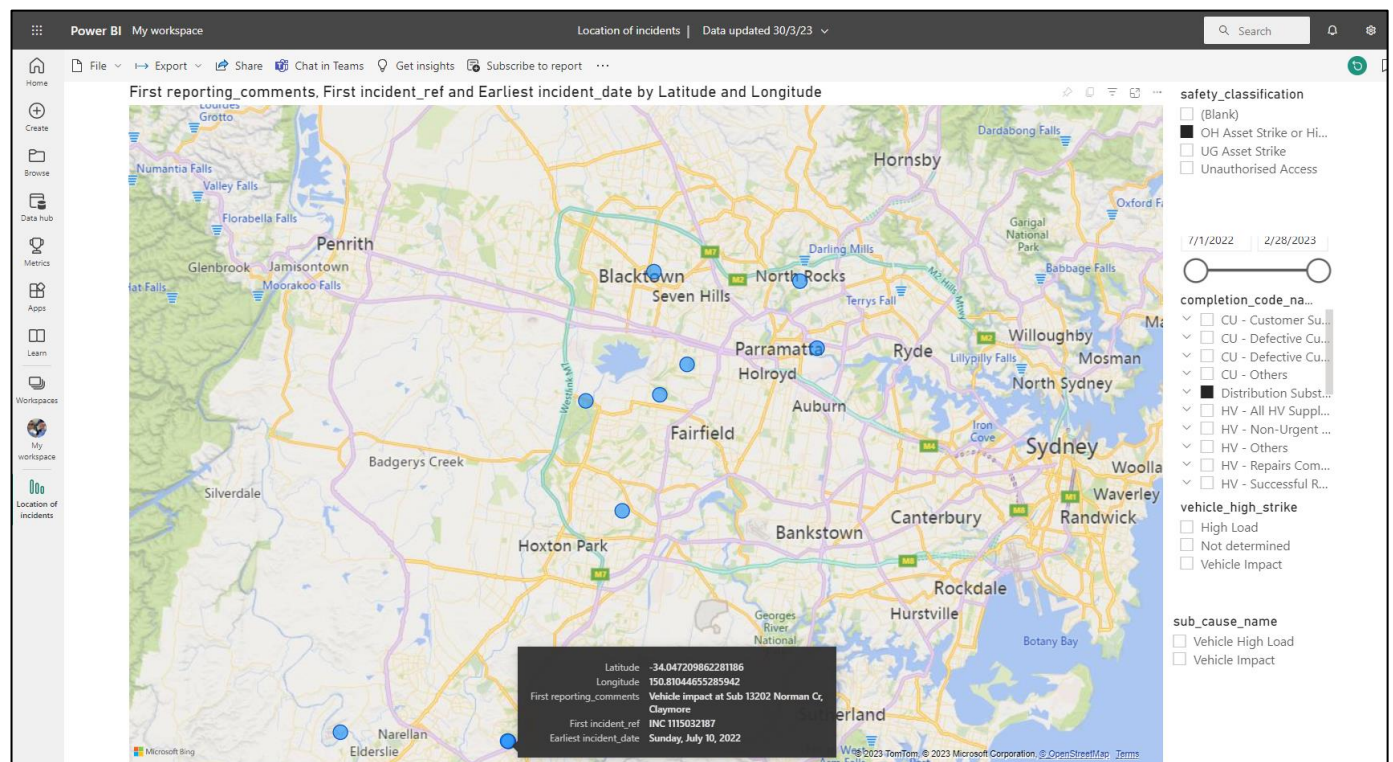
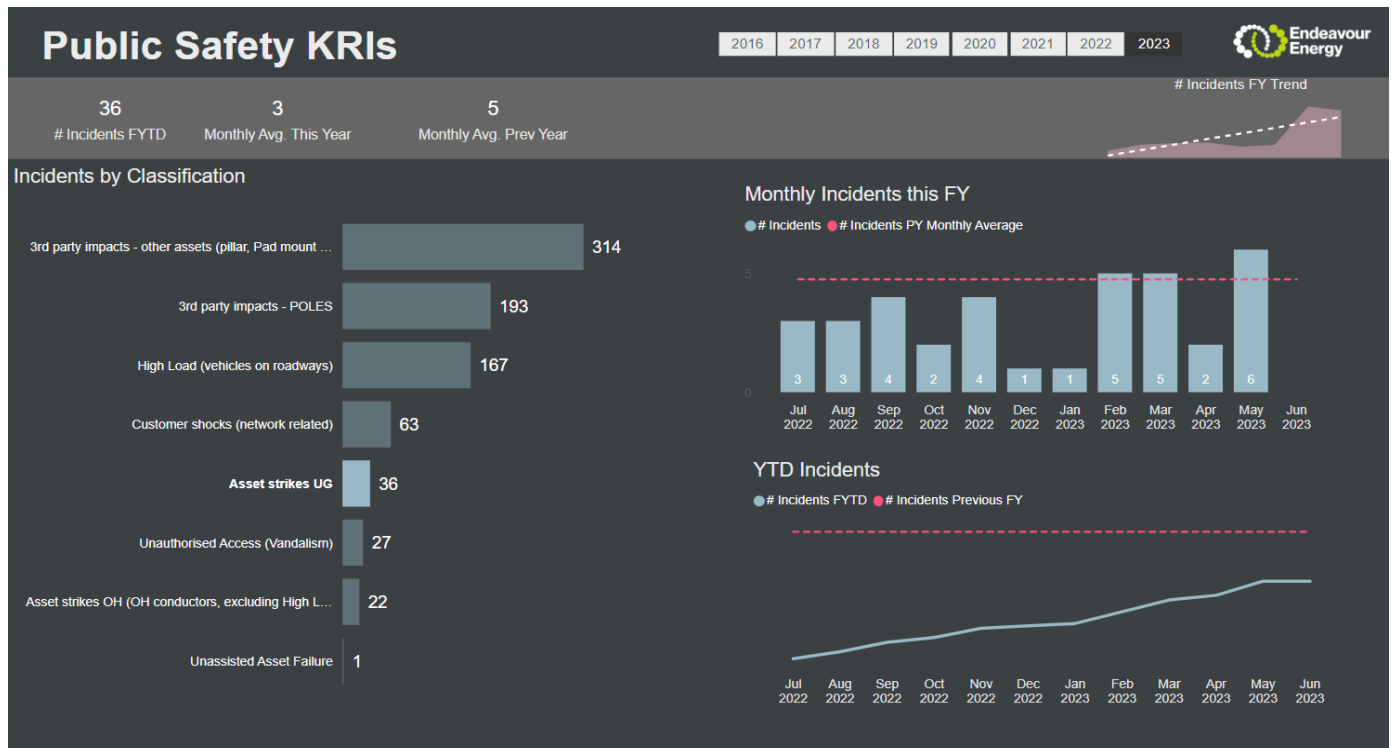


2.2 Technology

2.2.1 Improved Data and Analytical Tools

Endeavour Energy is utilising data and analytical tools to provide interactive Key Risk Indicator (KRI) reports that can identify emerging risks, trending incidents and hotspots of concern using geospatial technology.

The Reporting and Insights team is exploring a multitude of internal and external data platforms including Feature Manipulation Engine (FME) which is a geospatial extract and transformation program, as well as publicly available data sources such as 'Google Point of Interest' information to map population density, people movement in public spaces and other data science insights that will assist prioritisation of defects and proactive programs.

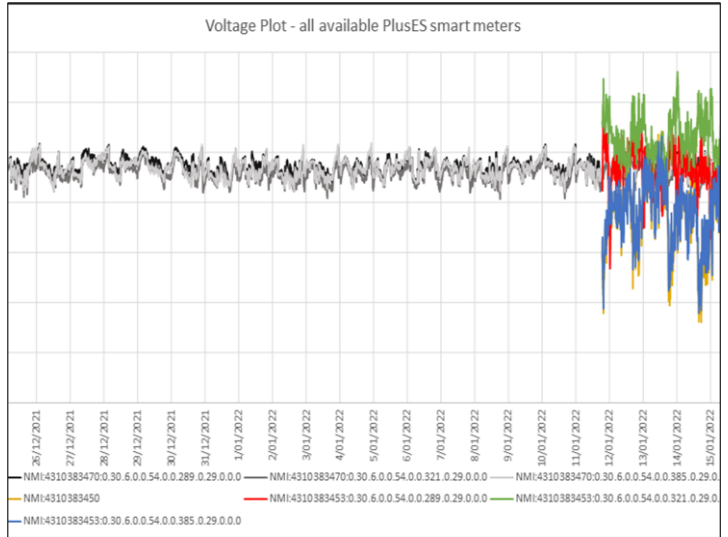


2.2.2 Smart Meter Data Analysis

Endeavour Energy is utilising the FutureGrid platform which is a power quality data analytical tool to assess real-time monitoring of customer installations via Smart Meters to proactively monitor and identify suspected neutral connectivity issues before a member of the public receives an electric shock.

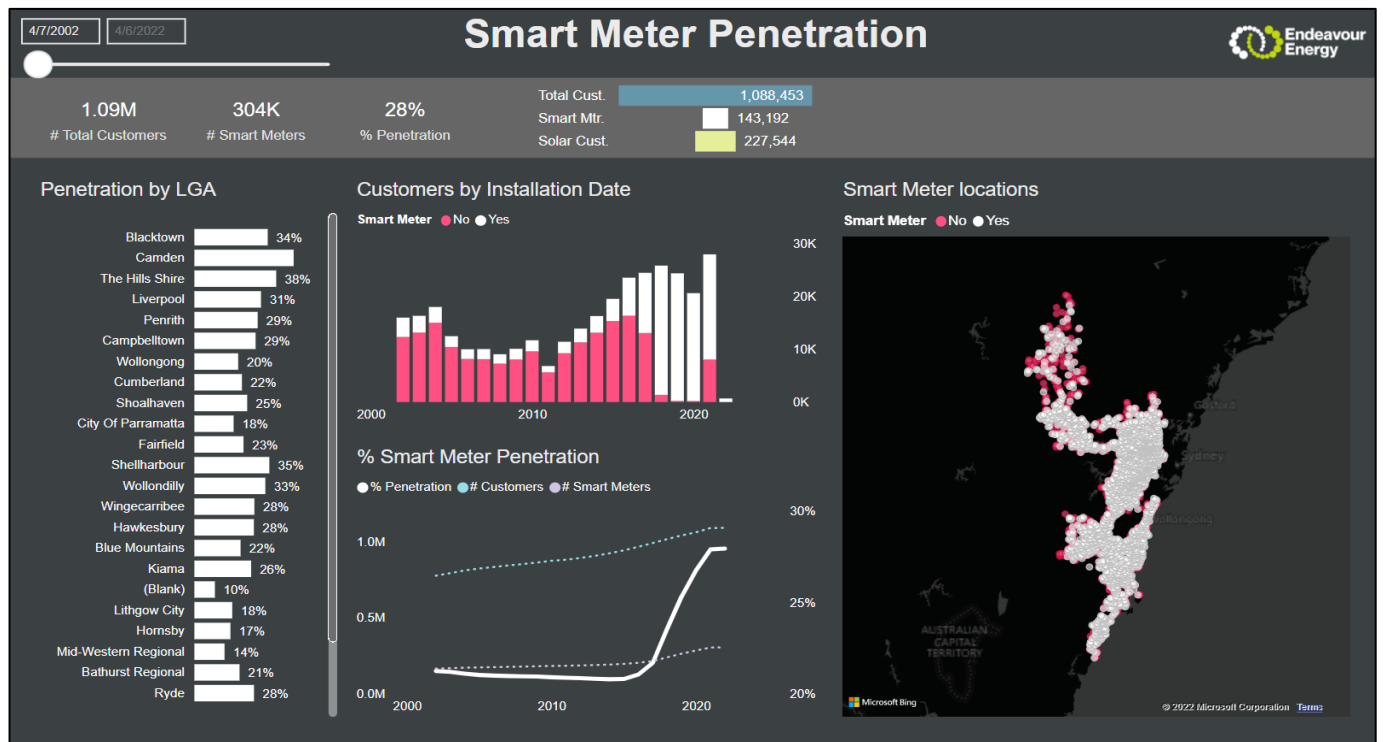
Approximately 300,000 (27%) of our customers now have a smart meter installed, out of which we currently have access to the data of 65,000 meters (~6.5% penetration of Endeavour Energy’s entire customer base).

Endeavour Energy does not automatically gain access to the data and must procure from the metering provider.



Since the program’s commencement in February 2021, we have proactively responded to and repaired over 75 defective neutral connections before a member of the public has received an electric shock.

As part of the next regulatory proposal, we are seeking access to a total of approximately 250,000 Smart Meter data points (around 20% - 25% penetration of Endeavour Energy’s entire customer base), starting from FY 25.



To facilitate the deployment of smart meters, and obtain more non-market smart meter data, we will continue to engage and influence stakeholders, including:

- Energy retailers and metering co-ordinators;
- Regulatory and government departments, such as the Office of Energy and Climate Change.

2.2.3 Digital Twin 3D Model

Endeavour Energy have experienced a range of environmental challenges including heat waves, drought, flooding, wildfires and extreme storm conditions.

In response to these events and to enable a proactive approach to managing the network, utilising technology, we have developed a 'digital twin' of our network. This digital twin is a virtual model designed to reflect a physical object, process or system. It incorporates relational interactions with data and simulations, allowing us to better understand and manage our network.

The model includes 3D overlays based on data collected and manually calibrated through visual inspections, helicopter flights, Google Earth and the digital twin.

This information was refined over time to provide more accurate data and insights to proactively manage the network and share information with customers in the interest of public safety.



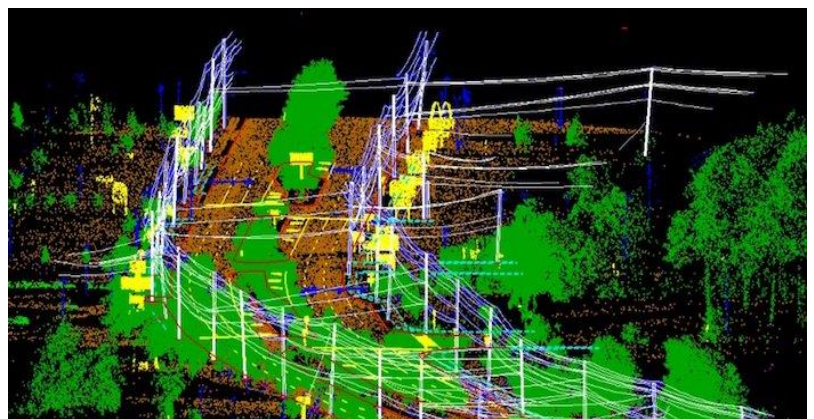
Using the physics-enabled software performing complex engineering analytics, Endeavour Energy can now manage critical assets that may be at risk from multiple factors, including high tension and encroachment risk.

With this information, we can identify high-risk and high-priority areas of the network when simulating extreme weather events such as high winds, extreme heat, rising floodwater and wildfire to understand the impact on the network and our customers.

This technology enables Endeavour Energy to have faster response times for asset inspections and drastically reduces restoration times to extreme weather affected customers.

In addition to the emergency response, Endeavour Energy has been able to utilise this modelling technology to improve existing asset management and replacement regimes.

With high quality LiDAR data already captured, we can better understand scenarios and optimise asset maintenance workflows enabling better asset replacement strategies by prioritising the highest-risk and highest-impact assets.



2.2.4 Asset Inspection Technology

Endeavour Energy is using data and new technology to improve public safety outcomes.

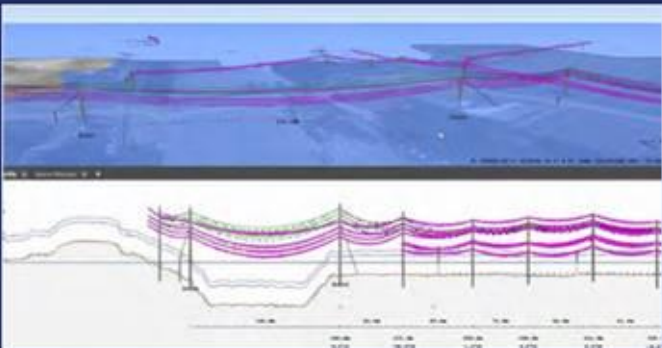
Endeavour's drone program has provided unmanned aerial capability to over 50 drone operators across all operational areas of the enterprise to assess operational circumstances and inspect assets quicker and safer.

This capability was recently put to the test after severe storms impacted power supply to 54,000 customers across our network. Within 30 mins of deployment, our drone team successfully located a critical fault on a transmission line and were able to repair it on the same day, creating significant time and cost efficiencies. Typically, crews use binoculars and drive the line to inspect for damage, however its location in heavy bush would have made this fault near-impossible to find.

LIDAR mounted drone and vehicle (LICAR) units are in operation and in combination with the Digital Twin we now have the ability to assess additions and alterations to the network compliance to standards to a high degree of accuracy, ensuring that new assets meet safety clearances, clash avoidance etc. This process is currently in pilot phase, with insights gained and the feedback now enabled between design, project and field construction teams to facilitate continuous improvement between designers and field crews, improving the safety and compliance of future projects.

The LICAR was also used last pre-summer bushfire inspection (PSBI) season to validate our growth model for vegetation defects during the summer period with approximately 1,000 vegetation defects validated with highly accurate LIDAR data, further improving our management of bushfire risk.

In addition to using the Digital Twin to maintain public safety during last year's floods we have since used incorporated this capability into our design practices to ensure future assets are flood resilient as well as raising the height of existing assets to improve flood resilience of the existing network.



Planning for flood resilience

The digital twin allows Endeavour Energy to identify where assets are at risk from flood waters based on any potential flood and asset loading scenario.

The twin has been used to identify assets at high risk of flooding during various scenarios. This has allowed network designers to design a flood-resilient network and identify infrastructure improvements that would reduce flood impact on the network. For example, a project was completed where the height of a sub-transmission feeder was raised by three meters to reduce the impact of power loss from future floods to customers in the Hawkesbury region by up to 40% in a 1 in 100 year flood.

The design to raise the sub-transmission feeder height by about three metres as part of improving the flood resiliency of the network.

By combining our digital twin and LIDAR point cloud we are using advanced analytics to route the drones autonomously through and around vegetation, capturing pole-top assets that are not visible from the current method of PSBI inspections which uses low-flying helicopters.

It is anticipated that this will provide a cheaper, safer and faster method of inspecting our assets pre-summer while also improving public safety by capturing images not possible with helicopters.

Small pole-top drone inspection trials have been successfully conducted and a large-scale pilot of 10,000 poles using this technology which commenced in June 2023.

2.2.5 High Voltage Distribution Protection Modernisation

The high voltage distribution network is where most serious electrical accidents have the potential to occur. This includes overhead powerlines, underground cables and substations apparatus.

Endeavour Energy recently completed a High Voltage Distribution Protection Modernisation program and continue to explore opportunities for further risk reduction. This project involved a large investment over six years to replace older protection systems with modern digital computerised system, with the goal to substantially enhance the safety of our high voltage distribution system.

These modern systems allow us to significantly reduce the duration of electrical faults, especially when the energy levels are very high. This will help to reduce the severity of injury in the cases of arc flash burns to public workers who accidentally impact our network, and electrical injuries to workers or the public who inadvertently make direct or indirect contact with our powerlines. It also reduces the likelihood of our powerlines starting a fire.

There are many network events where this initiative has already proved its worth and substantially reduced injury severity or prevented injury altogether.

Safety is a shared responsibility, and while we've made these improvements, the potential for injury remains. As such we encourage our customers and the broader public to always remain vigilant and practice safety precautions around powerlines.



2.3 Worker Competency and Capability

2.3.1 Competency Management (Authorisations)

One of the predominant causes that give rise to the risk of a customer shock is a ‘reverse polarity’, i.e., the incorrect connection of active and neutral conductors of the distribution network, including service mains, during operational activities.

Endeavour Energy’s Electrical Safety Rules stipulate the requirement that: “all connections to the low voltage network must only be made after undertaking a documented testing process in accordance with Australian Standard AS4741 – Testing of connections to low voltage electricity networks, and the results must be recorded.

AS4741 requires the completion of comprehensive testing of the distribution network, and customer connections prior to energisation of an installation connected to the low voltage networks.



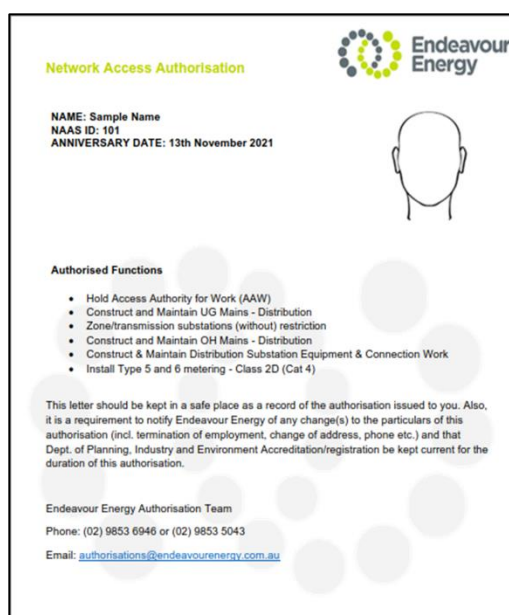
These tests include:

- Polarity testing – to confirm no transposition of active and neutral conductors; and
- Neutral integrity testing – to prove the integrity of neutral connections and identify ineffective neutral connections.

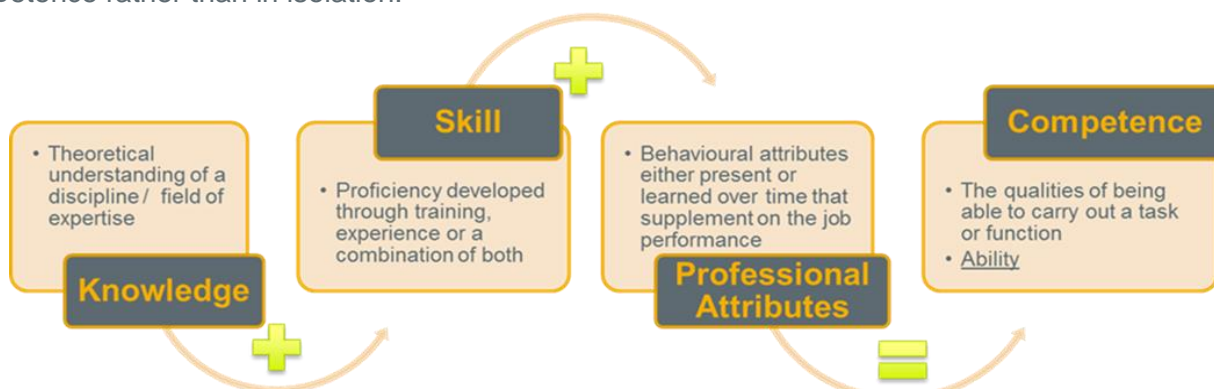
Endeavour Energy has an established framework to authorise persons to work on or near the company’s network, so that only appropriately trained and competent workers are authorised to carry out defined tasks on the network, including polarity testing.

The authorisations framework details trade, training and assessment, and refresher training and assessment requirements. An authorisation requirement for workers who complete polarity testing is to be annually re-assessed to the national unit of competency, demonstrating the ability to complete a polarity test by a qualified trainer assessor.

Competency essentially means the consistent transfer and application of knowledge and skill to the standard of performance ability required in the workplace.



Competency may be demonstrated by successful completion of theoretical and/or practical assessment of skills as nominated in the relevant procedure. Contributing factors that supplement technical competence include professional and personal attributes which should be viewed holistically in terms of competence rather than in isolation.



2.3.2 Verification and Assurance Activities

In accordance with Endeavour Energy's Health, Safety and Environment Assurance Plan, process audits are carried out annually on Safety Critical Processes (BR1.1 Exposure to unintended discharge of electricity and BR1.8 Harm to member of the public).

Each year, in order to provide a level of assurance and verification of compliance, a narrow focus audit assessing worker competency specifically relating to polarity and neutral integrity testing activities is undertaken.

The audit assesses three main criteria:

1. The technical understanding of polarity and neutral integrity testing processes;
2. Verification of compliance with approved testing and live LV work practices; and
3. Overall work practice impact/effectiveness.

Overall Work Practice Impact/effectiveness on a range of factors include:

- Consistency between workplace documentation / guidance and the training material;
- Practical relationship between existing workplace practices and performance expectations communicated through training delivery; and
- Connection between the frontline workforce and the development of workplace documentation / guidance.



2.3.3 Workplace Instructional Resources and Ongoing Education

2.3.3.1 Responding to Shocks and HV/LV Intermix Faults

Endeavour Energy continually explore opportunities to increase the technical capability of our field workers through ongoing education and provision of instructional resources to guide critical testing and investigative processes.

In FY23, a company-wide education and awareness program was rolled out to all field service centres relating to shocks investigation and responding to high voltage intermix faults. The Program included a revision of the testing methodology, what equipment to be used and development of a user friendly technical document guiding the end-to-end process.

The process for first response to shocks and intermix faults was reviewed with a comprehensive HSE quick guide developed for field workers and their management teams.

HSE QUICK GUIDE

RESPONDING TO SHOCKS AND HV/LV INTERMIX FAULTS

Intent: To provide field workers guidance on the testing and inspection protocols when responding to customer shocks and potential HV intermix faults.

Responding to a suspected electric shock

Arrival at site and preparation

- Apply required PPE including safety glasses and LV insulating gloves with leather outers assuming all conductive components are energised.
- Ascertain if anyone has received an electric shock and if so – direct them to seek medical assistance immediately.
- Attempt to determine what was being done at the time, if it has occurred before and for how long.
- Inspect the service from the network to switchboard (looking for any obvious signs of damage for example, damaged connections, loose terminations, obvious signs of burning and/or mechanical damage, etc).

Note: If there has been any serious injury and/or fatality – Make the immediate site safe, secure the site and preserve any evidence and notify the Public Safety Manager immediately to proceed with the necessary regulatory reporting and involvement from Safe Work NSW.

Initial testing/inspection (front of board)

- Test all metallic/conductive components for voltage (>6V) before opening switchboard enclosure using an independent earth.
- Progress to the customers main switch board looking at:
 - Visual inspection of all neutral and earthing connections for damage, heat or corrosion, and
 - Circuit breakers' fuses for operation.

Initial testing/inspection (back of board)

- If equipped with a long meter – compare current flow in consumers (main switches) as well as consumers main neutral and main earth.
- Tong main Neutral and main Earth with service fuse removed to identify if there may be returning load from another source.
- If responding to a reported suspected electric shock, earthing and equipotential bonding cables should be tested for current flow and inspected, checking:
 - Main Earth Connector / Electrode / MEN;
 - Service Neutral/Consumers Neutral Connection;
 - Water Pipe Bond where possible and any other equipotential bonding present; and
 - As/If required, test continuity of the main earthing conductor if damage has been identified between the MEN point to the electrode <0.5Ω.

Approved by: Jolanda Lantieri | Approval Date: 21/07/2022 | Review Date: As required | WS/0037 | UNCONTROLLED IF PRINTED | Page 1 of 6

HSE QUICK GUIDE

Earthing and neutral system safety principles during testing and inspection
Simple principles to apply when managing the risk of forming part of an earthing circuit:

- All connections bonded prior to making and breaking connections;
- Completely insulated (live working procedures); or
- Completely separated (dedicated areas of electrical separation).

Switchboard Wiring Diagram and Basic Inspection and Testing Sequence

- Test neutral link and measure impedance for voltage missing (0V).
- Visually inspect all metallic earthing connections and cables for signs of damage. Test ear connection.
- Compare current flow between service and neutral with long meter.
- Test earth conductor continuity <0.5Ω (the impedance required for test).
- Test neutral integrity <0.5Ω.

Notes:

- Some older installations may not have separate 'service' and 'customer' neutral links and will need only one neutral link.
- Current standards require the Main Earth connections to be at the customer neutral link.

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HSE QUICK GUIDE

Typical defects as a result of intermix

Earth connection

- Earthing connections must be visually inspected for missing or failed connections, loose terminations and potential signs of burning.
- Make a reasonable attempt to locate and inspect the main earth electrode however, if it is not accessible, it may be assumed to be free of defect.
- Where possible, as/If required, test continuity of the main earthing conductor if damage has been identified between the MEN point to the electrode <0.5Ω.

Typical defects as a result of intermix

Switchboard (front)

- Generally, in severe fault sites, the damage will be immediately visible and most likely have a strong smell of burnt plastic - look for signs of burning, loose connections, melted or warped components and brittle conductor insulation.
- Under fault conditions and/or suspected fault conditions, LV working procedures and PPE must be used when accessing switchboards.

Typical defects as a result of intermix

Switchboard (rear)

- Following the same process as the front of the switchboard, in the rear behind the hinge panel there may be damage not immediately visible.
- Isolate all the service fuse before removing covers to inspect for connection faults and signs of damage (particularly at the main switch and metering equipment).

Note: Avoid disturbing any dust and/or swarf present in switchboard enclosures using precaution to open hinge boards or removal of any covers.

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2.3.3.2 Scenario Based Technical Training and Leverage of Technology

Endeavour Energy's Technical Training team are currently exploring opportunities to introduce virtual reality headsets into the standardised curriculum to enable realistic scenario based training and assessment interventions with critical testing and energised work practices marked as a priority area to implement.



2.4 Public Awareness and Community Engagement

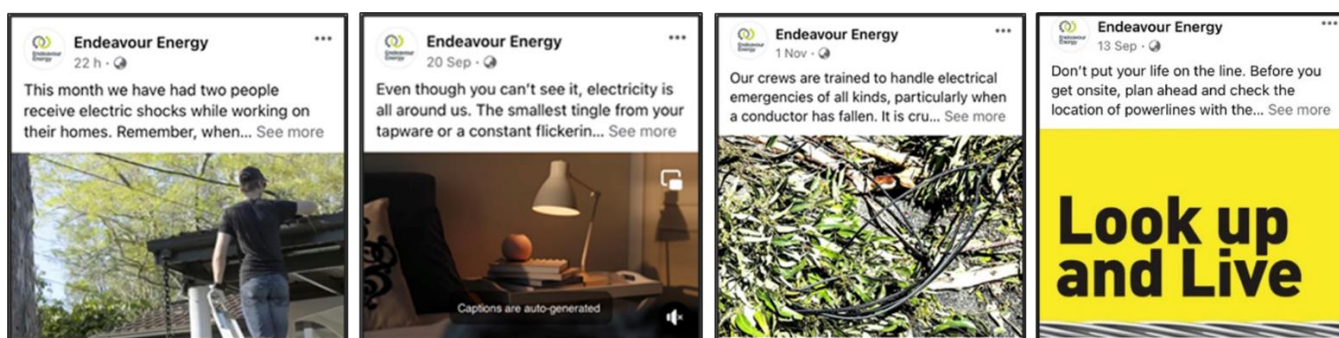
2.4.1 Public Safety Awareness Social Media Activities

Endeavour Energy develop a Public Safety Awareness campaign each year based on incident data and emerging trends that is focused on assisting the public to understand the hazards associated with the network and how they should be controlled.

The content of the posts can be general in nature and proactively address a broad range of risk categories for members of the public. Alternatively, the posts can be targeted to focus on key risk areas such as construction, transport, agriculture or logistics, taking into account scenario-specific or location-based risks that need to be managed.

When an incident trend is observed or new learnings are identified, reactive posts are published to help educate members of the public and public workers.

Through stakeholder engagement, exploring various mediums and creative content, we gain insight and understanding of our target audience. This approach allows us to achieve significant organic engagement and reach across the franchise area with our social media posts, whether they are proactive or reactive in nature.



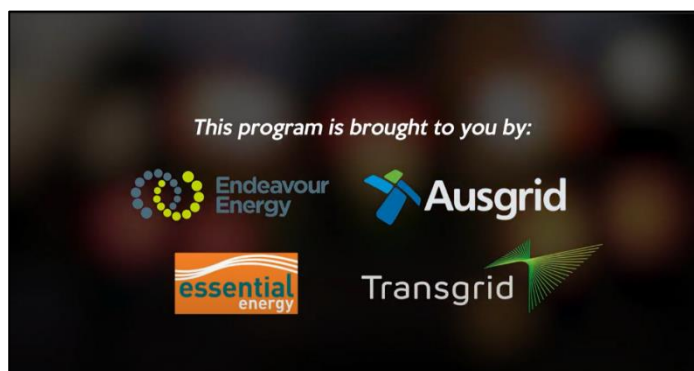
2.4.2 Emergency Services Electrical Safety Education

Keeping our team members and communities safe is of utmost importance to us at Endeavour Energy.

We teamed up with Ausgrid, Essential Energy and Transgrid, to create an Emergency Services Electrical Safety Training video and ongoing education program with the various emergency services agencies.

The video is essential viewing for emergency responders, imparting critical information about the knowledge and skills required to safely manage emergencies involving electrical networks and hazards.

This collaborative effort involved all NSW Network Service Providers, NSW Police Force, Fire and Rescue NSW, NSW Ambulance, VRA Rescue NSW, NSW State Emergency Service, and NSW Rural Fire Service.



2.4.3 Domestic Electric Shocks and Community Awareness

Domestic electric shocks or “tingles” can be a sign of a bigger problem. Endeavour Energy provides 24-hour 7 days a week services to the community to verify the source of a shock.

If the cause of the issue is determined to be related to Endeavour Energy’s network, Endeavour Energy will conduct necessary repairs at no cost to the customer.

If the cause is found to be associated with the customer’s private network or home wiring system, Endeavour Energy will make the site safe and advise the customer to engage the services of an accredited electrical service provider at the customer’s cost.



Endeavour Energy uses its social media platforms to communicate the risks of domestic electric shocks and emphasise that they should never be ignored.

2.4.4 ‘Electric Kids’ Education Program



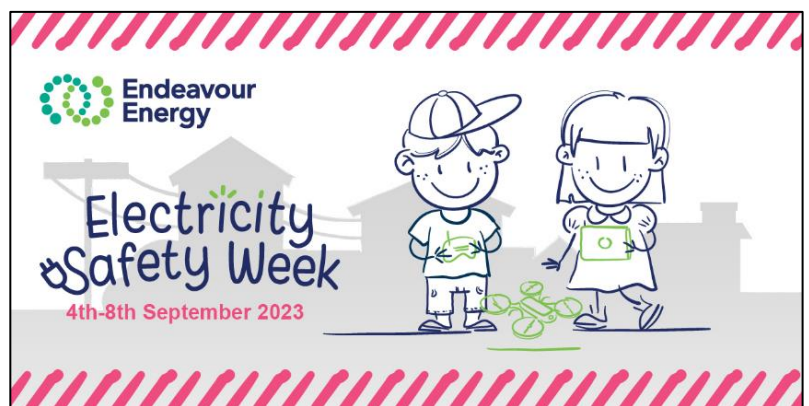
Endeavour Energy is proud of its contribution to the education of primary school children in developing the [Electricity Safety Week Program](#).

This interactive program educates young people on how electricity works, how to use it and how to stay safe around it, both inside and outside the home.

The teaching resources are supported by the NSW Department of Education and aligned with the NSW Science & Technology and Personal Development, Health and Physical Education (PDHPE) syllabuses for K-6.

Initially developed by Ausgrid, the program is now delivered across NSW and QLD. Endeavour Energy has participated in this initiative for 15 years.

Over 500 schools participate each year, representing 90% of the schools in our franchise area. Based on the teachers’ feedback, around 90% expressed their belief that the Electricity Safety Week activities helped students to be safer around electricity.



Key messages to educate the next generation include:

- Never climb a tree that is near powerlines. Look up before you climb;
- If you see fallen powerlines, stay well clear of them and tell an adult;
- Water and electricity do not mix. Never swim or go near water in an electrical storm;
- Never play near high voltage areas – substations, transformers or power stations;
- Do not put objects into power points and electrical appliances; and
- If you see a dangerous situation - stay clear and tell an adult.

2.4.5 Community Assistance and Support

Endeavour Energy play a critical role in the community in times of need and responding to extreme weather events and natural disasters. Liaising with customers, residents and community stakeholders can be challenging when faced with loss of power supply, limited access and other factors resulting from extreme weather.

In response to this challenge, Endeavour Energy developed a community outreach initiative with a mobile trailer set up to support the community and provide critical information in times of need.

The trailer is deployed primarily when responding to large scale network outages and responding to our community in storms, floods, fires and where power may be affected for a substantial duration of time.

Visit our [website](#) to find information and resources to help you stay safe around electricity.



Essentially the trailer is a standalone self-sufficient and mobile community information hub that can go anywhere it is needed to represent Endeavour Energy and is equipped with the following features:

- Set up to enable face to face interaction for outer lying communities
- Up to date ADMS information displayed on TV's
- Broadcasting of any news to the community
- Charging station for mobile phones/devices
- Hot water for tea and coffee making
- Microwave to assist with food heating for infant food and bottles
- Fridge for storing cold beverages for the community or our crews



2.4.6 Life Support Customers

Endeavour Energy interacts with life support customers everyday through planned and unplanned outages, over the phone, online or through social media and in the field. We commit to providing our customers with valuable advice and information year-round and continue to expand on the information we can provide.

We strive to build a universal understanding amongst our community that a continuous energy supply can be compromised and that a robust back-up plan is always required. We support our customers by providing best practices around safe alternate energy supplies and new technologies as they emerge.



We also proactively communicate with our customers bi-annually with information specific to environmental factors they may be facing, with our first winter letters sent to all 37,000+ customers in our network area.

Stay safe this winter with your life support action plan

Every winter, it is important that as a household that relies on electricity for medical equipment, you review your life support back up plan to prepare for power outages and factor in the cold temperatures ahead. At Endeavour Energy we do everything we can to provide a safe and reliable electricity supply, however at times unexpected problems can affect the power supply to your home. It may also become necessary, from time to time, to interrupt your power supply to undertake upgrades or planned maintenance works.

CONTACT
Ph: 131 003
www.endeavourenergy.com.au

Access a free translator by calling 131 450

How will you hear from us?

Planned Outages

When planned outages need to occur, for maintenance of the network, we will notify you up to three weeks in advance by sending a notice to your nominated postal address. In the days leading up to your outage, we will remind you via **text message**.

Unplanned Outages

Outages can occur at any time without warning. This can be due to weather or external factors outside of our control. If an outage occurs, we will contact you via **text message** to keep you updated on when to expect your electricity supply to return.

Your winter checklist

Update your mobile phone number

Contact us on 131 003 or visit www.endeavourenergy.com.au to have your phone number updated and we will send you notifications about outages and what to expect on the day.

Review your back up plan

Outages outside of our control can happen at any time. Use our winter back up plan tips on the back of this letter to take steps to protect your household in the event of an outage.

Our commitment to you

We will keep you updated about outages this winter by communicating with you in advance where possible. We need you to make sure your mobile contact number is up to date so that we can reach you and share information about upcoming and current outages.

endeavourenergy.com.au

Review your back up plan

- Ensure you have contact details for your doctor or medical adviser, nearest hospital, and nearby neighbour or relative that can assist in an emergency.
- Speak to your doctor about your needs in an emergency.
- Are your medical supplies fully stocked and can you access them in an outage?
- Do you have a torch handy if an outage occurs at night?
- How long does your back up plan last for?

Understand your capabilities without electricity

- Consider whether you can leave your home in an outage. Does your garage door need electricity to open?
- Are mobility aids such as a stair lift, electric bed or wheelchair accounted for in your back up plan?
- Do you have a torch or LED lantern you can use to light your way between rooms?

Prepare your home this winter

If you plan to stay at home during a power outage, winter temperatures may mean you should have other measures in place to make sure you and your household are comfortable, this could include:

- Ensuring doors and windows are closed. You can also use towels or linen to block drafts if needed.
- If you are expecting a planned outage, consider using a heater in advance to control temperatures in one part of the house.
- If using wood burning fires, ensure there is ample ventilation.
- If you own a generator, make sure you have fuel and never use a diesel or LPG run generator inside your home.

Consider alternate energy solutions for emergencies

- UPS batteries can protect your equipment from surges and provide energy for short periods of time.
- Rechargeable power banks are available from supermarkets and other retail outlets. They can be used to power small handheld devices such as phones, tablets, and digital radios.

Always remember in an emergency to call 000.
Stay informed about outages by visiting www.endeavourenergy.com.au or calling 131 003

endeavourenergy.com.au

Our dedicated Life Support Advocates within the Social Programs team partner with our vulnerable customers, assisting them to understand the protections afforded to them by Endeavour Energy.

Staff across the business understand that they all have a part to play when it comes to the identification and registration of Life Support customers. Endeavour Energy as a business is continuing with its “Powering Life” program broadening the scope of protections for our customers and working within Industry forums such as [The Energy Charter](#) to best navigate the coming years for our population.

For further information, please visit: [information for life support customers](#).

2.4.7 Planning Resources and Asset Data

Working alongside electricity infrastructure can be dangerous if the appropriate safety control measures are not applied.

Awareness of minimum safety clearances from powerlines and other electrical assets could mean the difference between a safe, successful and well managed project and a fatal accident. Time and money on a project can be saved by ensuring that the design of home or building complies with important safety requirements without the need for additional measures.

2.4.7.1 Look Up and Live

The Look Up and Live app is a powerful safety tool to adequately plan and raise awareness of safe working requirements near powerlines.

This straightforward worksite planning tool enables members of public to access powerline safety information from Endeavour Energy, helping them minimise the risk of contact while working in proximity to the electricity network.



Endeavour Energy’s overhead network data is published on www.lookupandlive.com.au and provides details of pole and conductor locations, conductor voltages and safe approach distances to be maintained.

Look Up and Live is now live including every network provider in NSW (including Sydney Trains), in addition to ACT, QLD, WA, SA and parts of Victoria.

The application is fully operational, with 87,000 individual uses of the app and 7,500 downloads recorded in the last year – visit lookupandlive.com.au today.

2.4.7.2 Before You Dig Australia

[Before You Dig Australia \(BYDA\)](http://www.byda.com.au) is a free referral service designed to assist in preventing damage and disruption to underground infrastructure networks which provide essential services to the community every day.



It provides a single point of contact to request information about all underground infrastructure networks on a project site, eliminating the need to reach out to them individually..

Endeavour Energy provide diagrams, drawings and plans of our asset data upon request to developers and constructors to assist locating and preventing damage to existing underground cables and apparatus.

The company is a member of BYDA and co-funds campaigns to actively promote the platform as an essential first step before commencing any excavation work. Endeavour Energy monitors its performance against the agreed timeframes to provide information to customers and continues to look for ways to improve end-user experience in working with the platform.

2.4.8 Collaboration with Industry Stakeholders

Endeavour Energy collaborates with Regulators and the construction industry on how to minimise risk when working around powerlines and other apparatus.

Endeavour Energy contributes to industry forums, supports reviews of Codes of Practice and provides regular presentations (on request) to the construction industry. These efforts aim to promote safe behaviours and improve understanding of the hazards associated with the network.



Look up and around for powerlines

Understand the safe approach distances on your worksite and when you need to have the power isolated.

Look up and Live

Download the App at lookupandlive.com.au

Make sure you know what lies beneath

Always check before you dig. Visit BYDA.com.au to identify cables before you start and take precautions to keep you safe.

Brought to you by your NSW Electricity Distributors

In FY23, facilitated face to face engagements at over 60 various industry forums and events including a range of private enterprise events, guest speaker sessions at industry conferences, local council education sessions, a National Energy Networks Australia forum and ongoing awareness sessions with Sydney Water, Jemena/Zinfra, Before You Dig Australia, Master Builders Australia, Transport for NSW, Safe Work NSW and other Distribution Network Service Providers (DNSPs) across Australia.

The Public Safety team continues to explore opportunities for collaboration and sharing of creative content with DNSPs from NSW, Tasmania, ACT, Victoria and QLD with plans in place to co-brand and deliver awareness campaigns and public safety educational material.

Within NSW there is a great appetite to collaborate with DNSPs to extend the reach of safety promotional material to a broader audience and share creative ideas.

Ongoing projects include educational videos on public safety risks and community safety. The videos will be used for proactive communications in preparation for extreme weather events and reactive posts to help respond to customer and community queries in times of need.

VIDEO #2 | ELECTRICAL HAZARDS IN FLOODWATERS

Demonstrate: 1) Situation of flooding 2) Explain risk: Flood waters can hide hazards like fallen powerlines. 3) CTA: Never enter flood waters. Watch out for electrical hazards hidden in flooded water ways and debris. Always assume powerlines and electrical assets are live. If you see a fallen powerline stay at least 8 metres away and report them

Floodwaters can hide electrical hazards, like fallen powerlines.

Never enter flooded water ways.

Watchout for electrical hazards hidden in flooded water ways and debris. If you see a fallen powerline stay 8 metres away

2.4.9 Industry Engagement and Advice

Endeavour Energy operates its network in some of the most densely populated suburbs of Australia.

Urban expansion and infrastructure development increases the potential for accidental exposure to the network by public workers. Accidental contact with overhead and underground powerlines increases the risk profile for the community through power outages and secondary contacts (e.g., fallen powerlines).

Damage to the network also increases Endeavour Energy's operating costs through repairs and cancelled work. While Endeavour Energy designs and constructs the network to minimise potential for harm, it is acknowledged that awareness, behaviour and risk perception influences the actions taken by groups within its community.

To combat this, Endeavour Energy provides complimentary resources to educate industries on risks specific to their undertakings. These resources include services such as BYDA, educational videos, learning material for various industries, technical advice and engagement with developers to support management of these hazards throughout the process of work.

For further information, please download our information sheet: [electrical safety for building and construction workers](#).

2.4.9.1 Development Applications

As per State Environmental Planning Policy (Infrastructure) 2007, Section 45 (SEPP), When reviewing or assessing Development Applications (DAs), Councils must consider the potential electricity network implications, notify Endeavour Energy and provide us with a copy of the DA.

Endeavour Energy reviews and provides feedback and safety related guidance on DAs for structures intended to be built near overhead and underground assets.

Enquiries regarding feedback on DA are sent to property.development@endeavourenergy.com.au

Awareness of minimum safety clearances from powerlines and other electrical assets could mean the difference between a safe, successful and well managed project and a fatal accident. You may also save time and money on your project by checking that the design of your home or building complies with important safety requirements without additional measures being taken.



2.4.9.2 Property Enquiries and Easement Management

Endeavour Energy provides a property enquiry service via the Central Registry of Restrictions within NSW Land Registry to assist with customer property enquiries and ensure potential public safety risks are addressed.

This service is made available to Authorised Information Brokers including Solicitors and Conveyancers. This enquiry is usually made during the purchase of a property; however, is not mandatory in NSW.

NSW Land Registry makes available A Central Register of Restriction (CRR) search provides the customer with advice of any approved proposals for new easement requirements Endeavour Energy has in regard to the property in question.

A letter stating the interest and a copy of Design drawing if the parcel is affected, both in pdf format will be sent to the customer.

The Central Register of Restrictions (CRR) is a centralised database where participating organisations (known as authorities) maintain up to date information about possible or actual interests they hold against parcels of land within New South Wales.

Enquiries can be made via: property.enquiries@endeavourenergy.com.au

Endeavour Energy may have an interest on some private properties where distribution assets currently exist or may be located in the future. An easement is usually granted for this purpose as Endeavour Energy needs to have 24-hour access for safety, maintenance, and emergency repairs.

Electricity easements grant Endeavour Energy access rights to enter property and to control the use of land near powerlines, underground cables, and substations to maintain the safety and reliability of our network.

Easements help protect the safety of the residents living, working, and playing near powerlines. They help prevent serious incidents that could cause injury or even death. It is important to always keep the easement clear so regular maintenance, line upgrades, damage or technical faults can be attended to immediately.

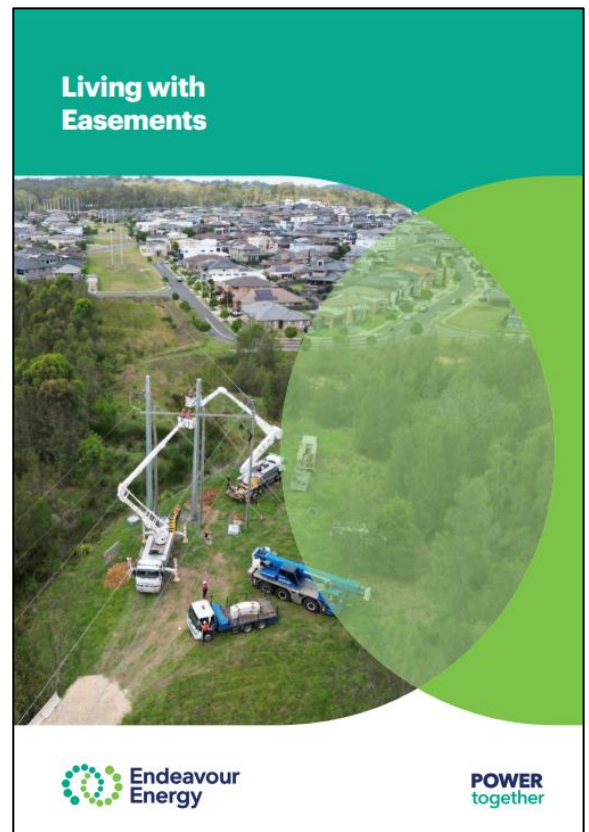
An easement will be defined and registered on your property title, to confirm details of easements on your property, contact your solicitor or the Land Titles office to find out details of easements on your property.

Alternatively, you can contact us by emailing easements@endeavourenergy.com.au.

We have developed a brochure with answers to the most commonly asked questions including what you can or cannot do in an Endeavour Energy easement as well as who to contact to obtain further information. Download a copy of 'living with easements' [here](#).

It should be noted that not all Endeavour Energy assets are protected by a registered easement, and assets on private and public land may have protection by a statutory easement provided by the Electricity Supply Act 1995 No 94.

In particular Section 53 of the Electricity Supply Act 1995 provides statutory protection for electricity works installed on land without an easement.



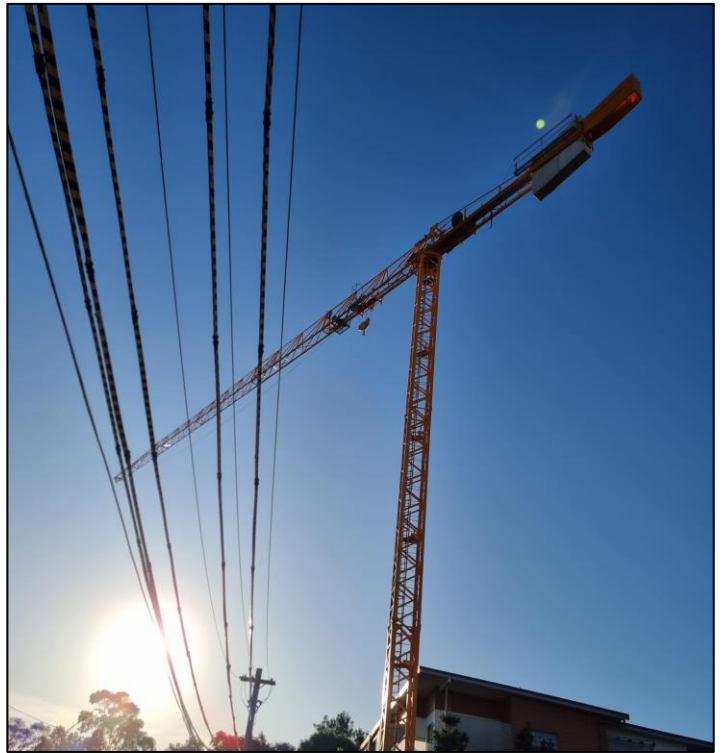
2.4.9.3 Building and Construction

Overhead powerlines continue to be the leading asset impacted by the construction industry.

It also represents the asset category with the most hazard reports due to scaffold, cranes and other structures being built within safe clearances from the network, increasing the risk of arc or direct contact between tools or building materials and the overhead network.

This presents a significant risk to construction workers, structure occupants and the community.

Endeavour Energy provides safety advice to all applicants seeking to work within safe clearances from overhead assets, consistent with The NSW Industry Safety Steering Committee (ISSC) Guide for network operators to provide information to the construction industry for working near overhead powerlines and the [Safe Work NSW Code of Practice - Work near overhead powerlines](#).



This advice may also incorporate the implementation of critical controls such as isolations, aerial markers and installation of temporary insulation (also known as tiger tails or tarapoli) to enable third party workers to safely build and operate on scaffold and, where required, use cranes to lift over the network.

In addition to advertising campaigns, Endeavour Energy also provides complimentary educational resources on its website. These resources aim to educate the industry about the risks posed by overhead powerlines and key control measures to manage those risks.

Information about how to request these services are promoted on the Endeavour Energy website.

Specific requests for advice are to be sent to construction.works@endeavourenergy.com.au

Working alongside electricity infrastructure can be dangerous if the appropriate safety control measures are not applied. Awareness of minimum safety clearances from powerlines and other electrical assets could mean the difference between a safe, successful and well managed project and a fatal accident.

You may also save time and money on your project by checking that the design of your home or building complies with important safety requirements without additional measures being taken.

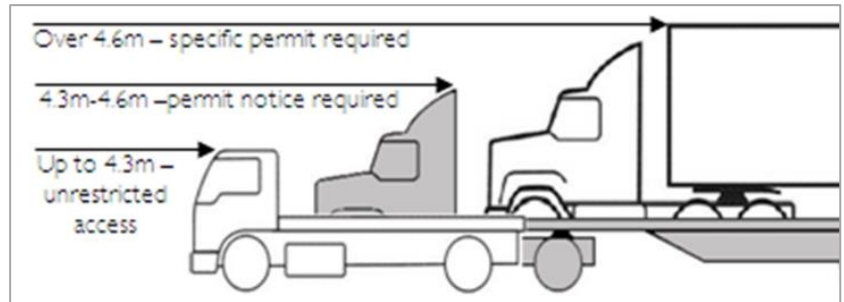
We have developed a brochure to inform anyone working on or around buildings or worksites near our network of the safe distances that must be maintained from our network assets, whether they are overhead or underground. Download a copy of 'where to draw the line on safety clearances' [here](#).

Visit our website for further information related to [building near electrical infrastructure](#).

2.4.9.4 Road Transport

Endeavour Energy's network is constructed and maintained to minimum clearances to allow vehicles to safely travel below overhead powerlines.

Road vehicle heights are regulated through the Road Transport (Vehicle Registration) Regulation 2017, limiting vehicle heights to 4.3m with additional provisions for vehicles up to 4.6m using prescribed routes under a permit system.

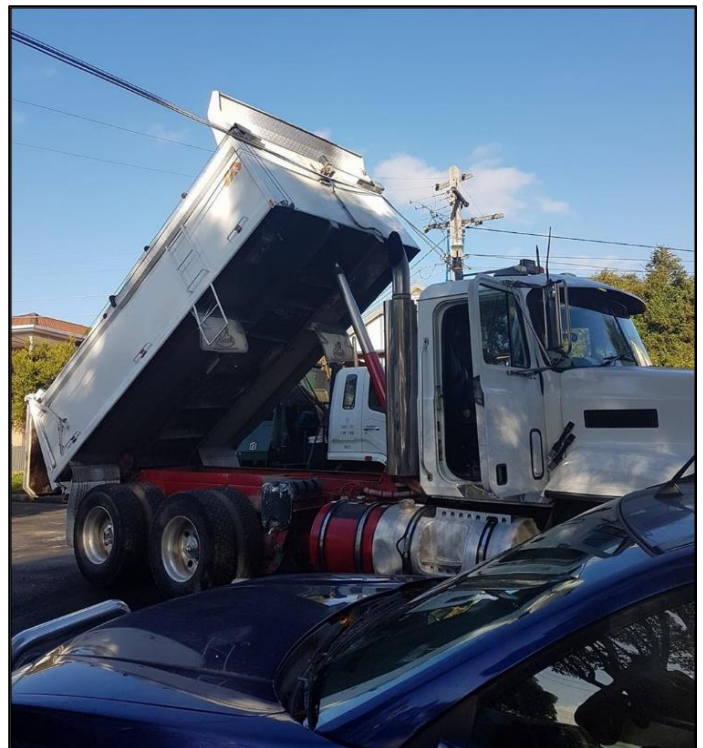


Endeavour Energy receives requests for special transport from TfNSW where vehicles greater than 4.3m are required to travel on roads that are not dedicated high vehicle routes.

Unfortunately, Endeavour Energy still experiences a large volume of over height vehicles striking the Endeavour Energy network and communication assets which have the potential to flick up into the overhead powerlines.

These events can damage poles, cause powerlines to break, and sometimes detach facias from houses, exposing the community to additional risk. Other common causes include tipper trucks and waste removal vehicles contacting overhead powerlines when tipping loads.

Endeavour Energy also provides free educational resources on its website and social media platforms to educate the industry about the risk posed by overhead powerlines and key control measures to implement to manage the risk.



2.4.9.5 Agriculture

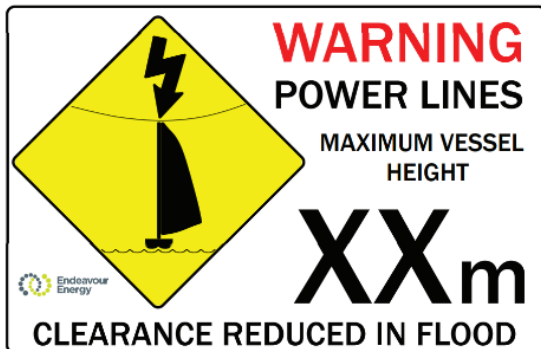
The agricultural footprint within Endeavour Energy's network area is comparatively small and contributes only a small portion of public safety related incidents.

In addition to the information shared for overhead powerlines, Endeavour Energy provides educational resources on its website and social media platforms communicating electrical hazards and key control measures to manage the risk when undertaking harvest and using over height farming equipment.



2.4.9.6 Marine and Boating

Endeavour Energy's network area is diverse, requiring an assortment of asset construction types to service its community. Where required we construct waterway crossings that are typically aerial designs over waterways.



Where there is a risk of contact, prominent warning signage is installed to minimise the possibility of masts contacting overhead powerlines.

Warning signage placed on the banks of waterways are consistent with the Crossing of NSW Navigable Water: Electricity Industry Code and Australian Standards AS6947: Crossing of Waterways by Electricity Infrastructure.

Extreme weather and flooding events have the potential to influence water heights and move vessels off course which increases the risk to recreational and commercial vessels contacting overhead powerlines. Boating implements such as fishing rods and yacht masts can also present a risk off the water when stowing or preparing to launch vessels where overhead powerlines may be present.

For further information, please download our information sheet: [electrical safety for boaters and yachties](#).

2.4.9.7 Aviation

Power lines pose a significant risk to low flying (below 60m/200ft) aircraft as they can be difficult to see, regardless of the weather conditions and can quite easily blend into the surroundings and horizon.

Endeavour Energy's pole and wire network can be difficult to see when viewed from an aircraft. That is why distribution networks present a considerable risk to low level flying activities.

This includes aerial crop management applications but also captures take-off and landing as well as refuelling and water collection for aerial firefighting (which can have additional visibility constraints due to smoke).

Other recreational activities such as hot air ballooning, hang gliding, paragliding, parasailing, parachuting, kite surfing as well as drone, kites and model aircraft operating also present risk to people and network assets when performed in proximity to overhead powerlines.

Activities that require high levels of wind present considerable risk as environmental factors can change instantaneously, blowing the operator off-course.

Endeavour Energy reviews approved allowable landing areas to ensure appropriate visual warning markers are placed on the network. Endeavour Energy also reviews the application of additional visual markers on request and supports the aviation industry with geospatial information where required.

For further information, please download our information sheet: [safety information for pilots](#).



3.0 Public Safety Plan compliance, review and accessibility

This Plan was prepared in accordance with the Electricity Supply (Safety and Network Management) Regulation 2014 and AS5577-2013 Electricity Network Safety Management Systems.

This Plan will be reviewed and updated as required against legislation and regulation applicable to distribution and transmission network service providers, industry standards including AS5577, Endeavour Energy strategic plans, relevant internal policies, procedures and standards, emerging risks, the Plan's effectiveness and our regulatory determination.

In accordance with the Electricity Supply (Safety and Network Management) Regulation 2014, this Plan will be made accessible to all stakeholders who are likely to be involved in its implementation and will be made available on Endeavour Energy's [website](#).



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