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Advanced Shocks Investigations

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Advanced Investigations

- Incidents where persons or animals:
  - Are badly injured; or
  - Killed; or
  - Where litigation is highly probable
- Extensive testing even if the cause is obvious

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Ensuring no Further Incidents

- Site must be made safe – evidence must not be disturbed
- The cause of the incident must be correctly identified so solutions are implemented
- Shocks incidents must be dealt with promptly and effectively

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Test Equipment

Insulation Tester

Earth Tester

Tong Meter

Multimeter

Logger

- Good quality and **calibrated** test equipment:
- If test equipment not calibrated - then have tested and obtain test report
- It may pay to have test equipment tested even if within calibration

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Key Questions

- Is the network faulty?
- Are the appliances/equipment in accordance with standards?
- Was the installation designed properly and installed in accordance with AS/NZS3000 and other relevant standards?
- Did protection equipment operate as it should?
- Has the evidence been tampered with?
- Is it an accident?

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Investigation Procedure

- Ongoing risk assessment
- Discuss with people involved to understand problem
- Advise the shocked person to seek medical attention
- Do not disturb the place or plant for Non-disturbance Occurrences
  - Detailed testing
  - Take photos and advise management
- Test at the shock site
- Test appliances and circuit (if involved) - if faulty, repair or disconnect and tag
- Test at main switchboard
  - Test suspect circuits
  - Tong active, neutral, earth & measure N-E voltage with
    - normal load
    - substantial single phase load
    - main switch off if necessary
- Carry out necessary repairs
- Retest
- Record test results and notes
- Complete incident form and report to authorities

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Legal Issues

- Freedom of information
- Subpoena

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Incident Report

- Statements from all relevant staff and members of the public
- Essential facts only
- Details of alleged incident
- What the customer said and did
- Details of who and how the incident was investigated
- Test results and test equipment used
- Any recommendations made to customer
- Layout of site and electrical equipment
- Photos
- Sketch of electrical circuit

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Reports should not include:

- Assumptions e.g. 240 volt shock
- Generalisations
- Irrelevant comments
- Unsubstantiated facts
- Personal comments about individuals

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Evidence

- Pieces of evidence e.g. faulty connections
  - should be labeled
  - must be kept in a secure location
- Equipment may need to be tested by an external test laboratory e.g. safety switch

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Induced Voltages

To establish if voltages are induced:

- Measure initial and sustained voltage
- Measure leakage current
  - Use a filter network - Figure 4 from AS/NZS60990:2002
  - Appliances should have a leakage current of <1mA

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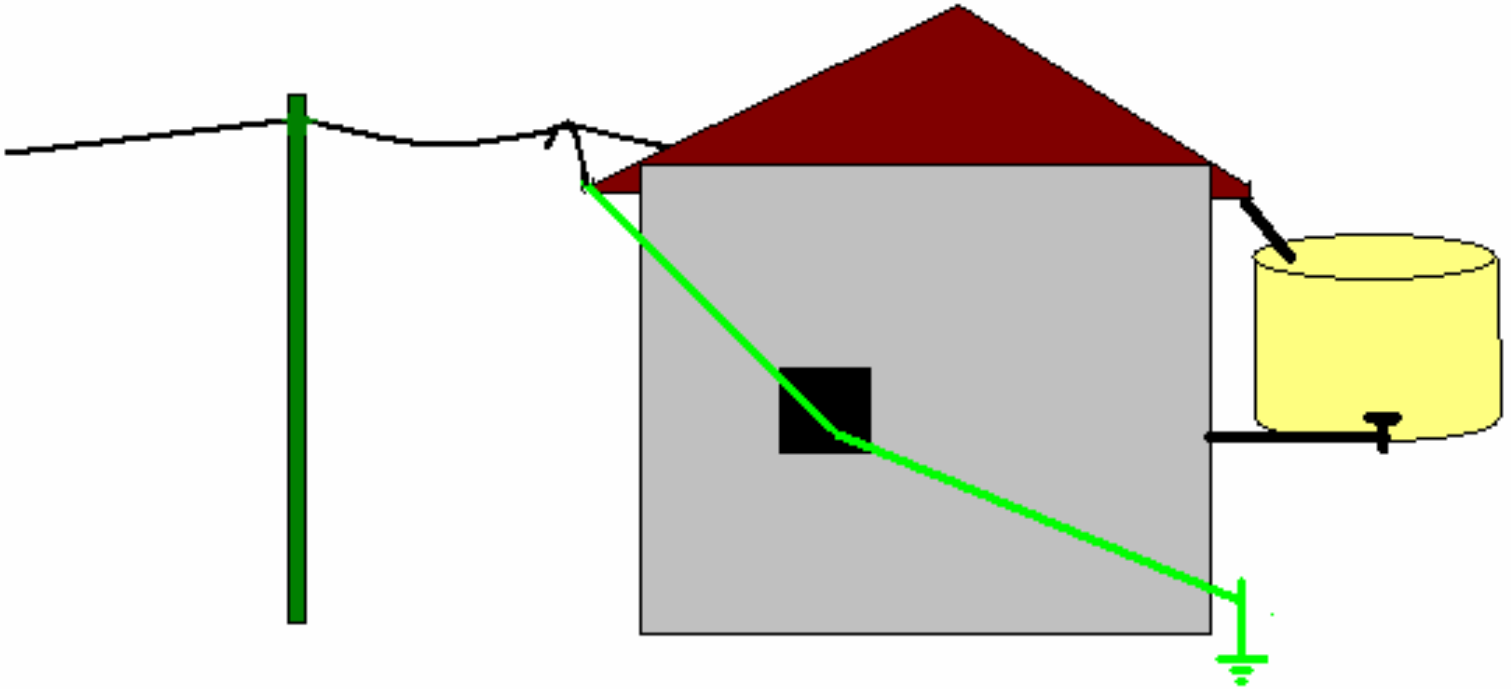
Case Studies



Resident received a shock from the tank

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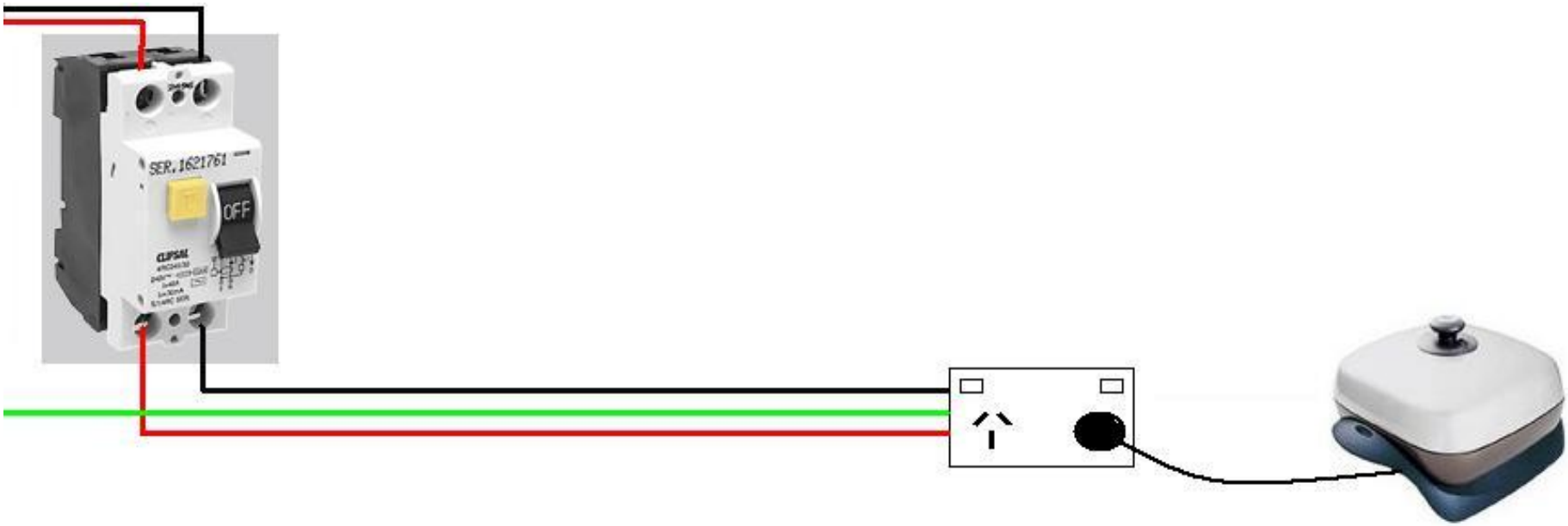
Case Studies



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Questions and Discussion

- Your questions or problems discussed!

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Summary

- Is the network faulty?
- Are the appliances/equipment in accordance with standards?
- Was the installation designed properly and installed in accordance with AS/NZS3000 and other relevant standards
- Did protection equipment operate as it should?
- Reports not to include assumptions, generalisations, irrelevant comments, unsubstantiated comments, personal comments about individuals.