070: Residual Current Device – RCD Protection

Facilitator duties for this session:

Obtain a portable RCD.

What this Safety Talk covers:

Proper use of RCD devices

Reference Material:

For further information refer to:

- Relevant State Legislation
- Company Policy Statement
- Company Procedures
- Safe Work Method Statements
- Work Instructions

What an RCD does

While a Residual Current Device [RCD] provides personnel protection, it does not protect equipment or circuit conductors. No device or policy provides complete protection from shock. The RCD is one part of a larger protection plan that includes earthing conductors, double-insulated tools, and attention to potential hazards. An RCD will not protect you from:

- Line to line faults. For example, you grab Phase A with one hand and Phase B with the other.
- Line to neutral faults. For example, you grab an active with one hand and a neutral with the other.

An RCD uses a Current Transformer to measure the current in the live conductor and the current in the neutral. When the difference in these exceeds a certain value, the device assumes the difference is due to a fault to earth. That value is generally 30 mA. This value is on the threshold of the "let go" current. The RCD, if in operating order, will interrupt the circuit. Because it does this in less than 300 msec, it should prevent electrocution. If the RCD is damaged, however, it may not do this. As most RCD's in use today will still provide power, even if the unit no longer provides RCD protection it is important to ensure these units are tested regularly in line with workplace safety requirements. Power transients, such as those from lightning, can damage an RCD.

Devices that incorporate RCD protection include panel-mounted breakers, power outlets, and portable cord fitted devices. New RCD protection products arrive on the market all the time.

When and where you must use an RCD

You must use an RCD device on your construction site whenever you use any electrical device whatsoever. These other "must use" notes assume you don't have an assured equipment earthing system.

- You must use an RCD for all temporary wiring.
- You must use an RCD whenever you use an electrical device, even if power comes from a permanent outlet inside the building.
- You must use an RCD with all portable cords.

RCD wiring

Every RCD device comes with wiring instructions. RCD devices are normally marked with LOAD and LINE designations. You must connect the upstream wiring (from the supply panel) to the LINE side, and any subsequent downstream outlets to the LOAD side. If you reverse these connections, the RCD will not work correctly, if at all.

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Review and Discussion

What will an RCD not protect you against?

What does an RCD do?

When and where must you use an RCD?

Can an RCD provide power even if it's not providing protection? What does this mean?

What must you do before first use?

Does an RCD require an earth wire for it to work?

What is the difference between LOAD side and LINE side?

If an RCD trips, what should you do before using it again?

What if an RCD nuisance trips?

Where can you not use a single-pole RCD unit?

Proper connection of the active, neutral, and earth is critical. A common mistake is connecting the earth wire to the neutral wire and the neutral wire to the earth. Another mistake is swapping the live and neutral connections.

Remember, never earth the neutral at any point other than the MEN connection in the fixed electrical installation. This will be only at one point (usually at the Main Switchboard) where the neutral and earth are connected at the MEN connection.

How to ensure the RCD is protecting you

Always test the RCD before first use on a shift. To test it, push the "Test" button to simulate an earth fault. Then, verify that the RCD has cut the power off. Then reset the RCD to check that it has restored power.

If an RCD gives rise to nuisance trips, try replacing the unit. If the problem persists, look for wiring errors or wiring damage.

If an RCD trips, always test it before using it again

Demonstration

Have a crew member explain which terminal is for live load and which is for neutral. Have another crew member demonstrate what to do before first use each day.

Notes:

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Review and Assessment

Participant Name:_____

Please circle the correct answer to the following questions.

A Residual Current Device [RCD] provides personnel protection, it does not protect equipment or circuit conductors.	True	False
No device or policy provides complete protection from shock.	True	False
An RCD will protect you from line to line faults.	True	False
An RCD will not protect you from line to neutral faults.	True	False
The RCD, if in correct operating order, will interrupt the circuit.	True	False
Power transients, such as those from lightning, can damage an RCD.	True	False
Proper connection of the active, neutral, and earth is critical.	True	False
You do not need to always test the RCD before first use on every shift.	True	False
If an RCD gives rise to nuisance trips, try replacing the unit. If the problem persists, look for wiring errors or wiring damage.	True	False
Don't use a single-pole RCD unit on circuits that have more than one phase circuits. Doing so simply prevents proper operation.	True	False

Participants Signature:_____ **Date:**_____

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Toolbox Talks Register

1. TOOLBOX TALK NUMBER / DETAILS

Date: ____/____/_____

Session Leader / Trainer Name: _____

Time Commenced: _____ Time Completed: _____

Site / Project Location: _____

2. PARTICIPANTS PRESENT

Name	Signature

3. ISSUES ARISING FROM TALK

Session Leaders Sign Off: _____

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