**Тема:**  «Защита сети. Заземление»

**Цель:** Повторить грамматический материал , продолжить изучать лексическую тему «электричество».

**Задачи:** Отработать навык работы (в т.ч. перевода) с профессиональной лексикой по теме «электричество», повторить тематический материал, актуализировать имеющиеся знания.

**Специальность:** 13.02.09 Монтаж эксплуатации линий электропередачи, 13.02.11 Техническая эксплуатация и обслуживание электрического и электромеханического оборудования (по отраслям)

**Время выполнения:** 90 минут

1. **Learn the glossary**
2. **Read the text**
3. **Do the tasks below**

**Ground Fault Circuit Interrupters**

In 1962, Professor Charles Dalziel of the University of California at Berkeley learned about RCDs (Residual Current Device) via his work in the area of electrical safety when he attended a meeting in Geneva, Switzerland. He subsequently teamed with a manufacturing company to help develop an improved version of an RCD with a lower trip level. *By using an electronic control circuit instead of an electromechanical relay, they could more accurately monitor the differential current and they were able to build a device with a trip level of 15 milliamps.* They called it a ground fault circuit interrupter (GFCI). By 1968, the National Electrical Code required the use of GFCIs in the circuits used for the underwater lighting of swimming pools.

Today, hundreds of millions of GFCIs are installed in electrical systems in North America. *The standard describes Class A GFCIs as devices designed to protect 95% of normal healthy adults by interrupting a circuit when a ground fault current exceeds 6 milliamps.* According to the standard, it must trip at 6 milliamps of leakage current and must not trip below 4 milliamps of leakage current. Since they are inverse-time devices, they react faster to higher currents. Class B GFCIs were the original GFCIs with a minimum trip current of 20 milliamps that were used in swimming pool lighting circuits. *They have long since been obsolete, but there are still some installed and in use.* Since RCDs and earth leakage circuit breakers (ELCBs) have higher trip currents, they do not meet the standard of a Class A GFCI in North America. They are, however, considered personnel protection devices in some other countries.

In brief, the standard calls for the use of GFCIs in any outdoor, wet, or damp locations unless the circuit is for egress lighting, exit lighting, or emergency lighting systems, or if tripping the GFCI could cause injury. Since the control circuit in a GFCI requires constant power, the use of standard GFCIs on dimmed circuits is not allowed. There are, however, special GFCIs with a separate non-dim input designed for use with certain dimmer racks.

1. **Translate the lines given in italics**
2. **Answer the following questions:**
3. What is the RCD?
4. What ways of residential power systems do you know?
5. What is the “minimum trip current”?
6. What is the A-standards calls for?
7. What is the main recommendations for using A-class GFCIs?
8. **How does it work?** Match the device with it’s functioning.

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| 1. **RCD** | 1. It recognizes the difference in the amount of electricity flowing into the circuit to that flowing out, even in amounts of current as small as 4 or 5 milliamps. This kind of protection reacts quickly (less than one-tenth of a second) to trip or shut off the circuit. |
| 1. **GFCI** | 1. It breaks the circuit if a fault in an appliance causes too much current to flow. It contains a piece of wire that melts easily. |
| 1. **Grounding** | 1. It constantly monitors the electric current flowing through one or more circuits it is used to protect. If it detects electricity flowing down an unintended path, such as through a person who has touched a live part, it will switch the circuit off very quickly, significantly reducing the risk of death or serious injury. |
| 1. **Fuses** | 1. It takes electricity that **is** flowing through a light's circuit and switch it on and then off. When this happens, it diverts electricity from the light bulb. The amount of electrical current flowing through the lightbulb **can be**  reduced gradually. |
| 1. **Dimmers** | 1. This way of protection gives electricity an efficient way to return to the ground by way of the service panel. The electrical current flows from the panel to the device that needs to be powered up, with the neutral or third wire acting as the return path to the ground for any unused current. |

1. **Put the words in the correct order. Give translations.**
2. All the/ materials/covered with/ wirings/ must be/isolating
3. All the/ have/ fuses/ rating/ voltage
4. Utility/ use/ companies/ T-T (terra-terra)/ system/ earthing
5. Breakers/ circuit/ serial connection/ can/ protect/ only
6. Can/ multi-pole/ there be/ single-pole/ and/ breakers
7. Breakers/ according to/maximum/ rated/ are/ their/ phase-to-phase/ voltage
8. A fuse/ is/ calibrated/ a/ weak/ in a circuit/ link
9. The waveform/ dimmer/ altered by/ is/ the switching action/ of the/
10. **Fill in the gaps with the following words. Give a proper translation:** path; circuit; dangerous; circuit; earthing system;

The higher voltage is much more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_because it produces more current given the same impedance. In some parts of Europe, the situation is exacerbated by the fact that the utility companies use a T-T (terra-terra) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-whereby the electrical service is grounded at the service entrance or utility pole and at the point of consumption as well. The ground fault return path is taken to be the earth, and if it happened to be a less than ideal conductor, then so be it. The problem is that if the impedance of the return \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-for fault currents is high enough, then the current is proportionately lower. Since the circuit breakers that are supposed to protect the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-from large short circuit currents have an inverse-time relationship with the current — the larger the current, the faster they act — they will not act as quickly as they would if the grounding conductor or circuit protective \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_were used to create a low-impedance path to the source.