M5-EN.3. ELECTRICITY RELATED RISK FACTORS

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Short description of the section:

In this section examples of typical **electricity related risk factors** **##G29##** that a driver of a land transportation company is subject to are presented and analyzed.

The goal of this section is:

- Present the notions of electric tools and electrical safety;
- Distinguish the most characteristic types of electricity related risk factors that vehicle drivers of a land transportation company are subject to;
- Present examples and describe manifestation of this risk;
- Distinguish negative effect of risk factors on human health; and
- Give recommendations for work safety measures.

Material of this section will assist the employee, the employer and the company owner in adjusting recommendations for identifying electricity related risk factors, ways of prevention and safety measures for himself or his company.

M5.3.1.jpg

M5-EN.3.1. The notion of electric tools and electrical safety

Notion "**electrical tools**" is used as defined in the International Electrotechnical Glossary of internationally recognized International Electrotechnical Commission (IEC)**:**

Every element used for electricity production, conversion, transmission, distribution or use, for instance:

- machines,
- transformers,
- apparatus,
- metering instruments,

- safeguarding gear,
- installation materials,
- instruments.

“Electrical safety” first of all means measures helping to avoid:

- Flow of electrical current through the human body (protection from hazardous power flow through human body) or
- Effect of electrical arc.

Besides, this notion encompasses electrotechnical effect posing **indirect hazard**, such as

- Fires or explosions; or
- Hazard resulting from insufficiently safe operation.

M5-EN.3.2. Safety labelling

Electric switches and electric currents fuses shall be clearly labelled with sign warning about potential hazards and giving instructions what actions to take. Here are some labelling examples:

M5-EN.3.3. Hazardous electrical currents (current dangerous to human health)

M5-EN.3.3.1. Risk factors, impact on human health

Electrical current may harm human health if it flows through the body (when the voltage of the current flowing through the body increases to a dangerous level). It may happen

- Getting into direct contact with parts having different potential voltage;
- Coming close to high voltage zone with primary electric arc in the air passage between the human being and the voltage.

Therefore, while assessing manifestation of this risk factor the following **must be inspected and identified**:

- Is sufficient safeguarding from direct contact installed (insulation, shielding of positive terminal, safe distance)?
- Is it ensured that the jumpstart cable is used as directed?
- Ar tvarkingi kasos aparato prijungimo elektros laidai? Ar nepažeista, neprasitrynus izoliacija
- Are electric appliances used on the trip (cable, portable drill, coffee maker, portable TV set and connecting cable) free of defects?

Hazardous current may have the following **effect on human being**:

- Traces in places of contact with electric current;
- Burns of different degree;
- Breathing arrest;
- Blood vessel damage;
- Ventricular fibrillation;
- Uncontrolled movements;
- Unconsciousness;
- Sudden death.

M5-EN.3.3.2. Safety measures

The following **work safety measures** are recommended to avoid the **effect of hazardous currents:**

- Ensure the use of safety guards from direct contact;
- Ensure the use of safety guards from indirect contact;
- Use safety locks;
- Use only faultless and inspected appliances;
- Comply with general rules of using electric appliances and equipment;
- Maintain safe distances;
- Inspect electric appliances before use;
- Regularly check and monitor the status of electric equipment;
- Arrange employee training and instructing;
- Introduce employees to electric equipment operation and maintenance instructions (pointing out jumpstart cable use instruction);
- Label hazardous spots with warning signs**.**

M5-EN.3.4. Electric arc

M5-EN.3.4.1. Risk factors, impact on human health

While assessing manifestation of this risk factor the following **must be inspected and identified:**

- Is the use of jumpstart cable as instructed ensured?
- Is safe distance from power and compressed air lines maintained in loading sites?

Effect of electric arc on human health. Thermal, dynamic and toxic effect of electric arc on human beings may cause the following injuries:

- Thermal effect: burns of different degrees.
- Dynamic effect: Injuries of moving parts when partitions and walls are broken by pressure in closed premises.
- Toxic effect: Intoxication with gas or CO.
- Lighting effect: Blinding.

Electrical arc may have indirect effect on human body in the event of:

- Fire caused by excess heat.
- Explosions caused by sparkles.

Therefore, the outcome of electrical arc may be different injuries, including fatal.

M5-EN.3.4.2. Electric arc - work safety measures

The following work safety measures are recommended to avoid negative effect of **electric arc**:

- Use safety guards from direct contact;
- Use safety guards from indirect contact;
- Use safety locks;
- Use appropriate appliances;
- Comply with general rules of using electric appliances and equipment;
- Maintain safe distances;
- Inspect electric appliances before use;
- Regularly check and monitor the status of electric equipment;
- Arrange employee training and instructing;
- Introduce employees to electric equipment operation and maintenance instructions (pointing out jumpstart cable use instruction, correct connection of the engine start-up accelerating device);
- Label hazardous spots with warning signs.

M5-EN.3.5. Self-study assignment

On the basis of information presented in this section draw a list of **electricity related risk factors** present in a typical driver's job in your company.

If the risk factor is defined by standard parameters, name the **regulations** related with the risk factor and **instructions** that have to be complied with.

Choose appropriate **measures (technical, organizational, personal) for elimination of risk factors** and determine whether **additional consultation of specialists** is required. If statutory acts provide for such (e.g., pursuant to legal acts on accident prevention), point that out.

Specify **who is responsible** for implementation of selected measures and when they must be implemented.

Fill in Table 4. You may use the **template ##D4##**.

Table 4

Company:

Person in charge:

Job:
Date:

Type of work, work equipment, workplace	Risk factors/ shortcomings/ loads (factor)	Factor related explanations and references	Regulations and working instructions	Measures: Technical, Organizational, Personal	Implementation (who) (when)