

EVALUATION OF OCCUPATIONAL RISKS AND POSSIBLE THREAT TO THE
SAFETY AND HEALTH OF EMPLOYEES

Date: April 2013

Compiled by: Ing. Dragoslav Tošič

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1. INTRODUCTION

The evaluation of occupational risks and potential threats to the safety and health of employees is prepared with the aim to identify sources of danger and risks, evaluating the severity of the risk and determining measures to eliminate or reduce the risk.

The estimate of the likelihood with which the considered risk can really occur is determined according to a likelihood estimate scale by 1 to 5 in an ascending order, where the rate, level of criteria of each risk is included.

The assessment and evaluation of the resources of risk is performed using the following specifications:

A. Probability of onset and existence of risk

1. Occasional
2. Improbable
3. Probable
4. Very probable
5. Permanent

B. Possible consequences of threat

1. Injury without inability to work
2. Absence injury (with inability to work)
3. More serious accident (requiring hospitalization)
4. Serious injury and injury with permanent aftereffects
5. Fatal accident

In determining measures to prevent occupational hazards and risks, the assessor derives from general preventive principles, which include:

- a) elimination of risks at the source of their origin,
- b) reduction of origination of risks,
- c) adapting of working conditions to the needs of employees,
- d) replacement of physically strenuous work and work in difficult working conditions with new technological and work procedures,
- e) preferential application of means of collective protection against risks over means of individual protection,
- f) establishing of appropriate guidelines to ensure safety and health at work.

Measures in case of fire and evacuation of employees are determined by the fire protection documentation according to the requirements of Act No. 133/1985 Coll. on fire protection, as amended, and implementing Decree of the Ministry of the Interior of the Czech Republic No. 246/2001 Coll.

Evaluation of occupational risks and possible threat to the safety and health of employees captures the current situation.

2. EVALUATION OF THE RISKS AND POSSIBLE THREAT TO THE SAFETY AND HEALTH OF EMPLOYEES DURING ADMINISTRATIVE AND ROUTINE WORK ACTIVITIES

OVERVIEW OF RISK ACTIVITIES AND THREATS:

- 2.1 Deficiencies in walking on flat surface
- 2.2 Improper use of furniture, aids and equipment
- 2.3 Deficiencies in the use of electrical appliances and devices
- 2.4 Load when working with computers
- 2.5 Improper electrical installation
- 2.6 Effects of adverse lighting

ASSESSED SYSTEM: Administrative and routine work associated with the operation of the activity

SOURCE OF RISK: No. 2.1 Floors, roads, communications

DANGER AND EVALUATION OF SEVERITY:

- | | | |
|--|----|----|
| - tipover, fall of person on flat surface | A2 | B2 |
| - interception on miscellaneous obstacles | A2 | B2 |
| - slipping when walking or working on wet or greasy floors | A2 | B2 |

SAFETY MEASURES:

- removal of any communication obstacles that can be tripped over
- removal of defects: holes, potholes, peeled flooring, covered el. supply
- wear suitable work shoes
- floors must be level and resistant to damage
- all aisles and routes must be open and passable at all times in the specified profiles
- dangerous places (narrowed and lowered profiles, etc.) must be marked with appropriate signs
- continuous inspection of the integrity of floor coverings

SOURCE OF RISK: No. 2.2 Improper use of furniture, aids and equipment

DANGER AND EVALUATION OF SEVERITY:

- | | | |
|---|----|----|
| - stability of cabinets and shelves | A2 | B2 |
| - moving and transport of operational items | A3 | B2 |
| - fall of objects | A2 | B2 |
| - burning, scalding | A2 | B2 |
| - electric shock | A2 | B2 |
| - drawers of tables and cabinets | A1 | B1 |
| - work with a stapler | A1 | B1 |

SAFETY MEASURES:

- removal of sharp edges, rounding of protruding corners
- through alleys min. 80 cm
- closing of cabinets, doors and closing of drawers
- removal of lying objects (electrical wiring, loose flooring)
- ensuring the stability of cabinets, shelves and chairs
- avoid overloading of shelves

SOURCE OF RISK:

No. 2.3 Deficiencies in the use of el. appliances and devices

DANGER AND EVALUATION OF SEVERITY:

- | | | |
|------------------------|----|----|
| - electric shock | A2 | B2 |
| - origination of fires | A2 | B2 |

SAFETY MEASURES:

- acquaintance of the operator with the instructions for use of el. devices
- check of the technical condition of flexible leads
- decommission and arrange for repairs when faults are detected
- avoid operating electrical appliances with wet hands
- cooker must be installed on a non-flammable thermal insulation base and at a safe distance from flammable objects
- thorough inspection of all electrical devices
- switched on cooker must not be left unattended

SOURCE OF RISK:

No. 2.4 Load when working with computers

DANGER AND EVALUATION OF SEVERITY:

- | | | |
|------------------------------------|----|----|
| - electromagnetic field, radiation | A3 | B1 |
| - eye stress | A3 | B1 |
| - load on the locomotor system | A3 | B1 |

SAFETY MEASURES:

- place the monitors so that the back side does not point at the employee; the same applies to the sides (up to a distance of about 0.5 m there is an electromagnetic field)
- place the seat to a height that when you sit upright with the hands resting loosely on the keyboard, the arms at the elbows form right angle
- position the monitor so that the top of the screen is at eye level or below
- situate the distance of the operator from the screen at the minimum of 0.6 m
- position the screen in relation to the window so that daylight is directed from the side, there should be no light source in the field of view of the operator (so that reflections projected on the screen are avoided)
- during the work with computer, include breaks after at least two hours to relax the cervical and lumbar spine and exercise fingers and wrists

SOURCE OF RISK: **No. 2.5 Improper electrical installation**

DANGER AND EVALUATION OF SEVERITY:

- injuries due to electric shock	A3	B3
- incidental contact of persons with live parts	A3	B3
- pull-out of supply cord due to undesired or forbidden handling	A2	B3
- violation of insulation of connected flexible leads	A3	B3

SAFETY MEASURES:

- prohibition to use damaged sockets, switches and defective components
- immediately report any detected defects in the electrical installation and arrange for a professional repair
- prevent persons without electrotechnical qualifications interfering with and repairing of el. installation
- ban on power lines supply cables where they could be damaged
- connect the extension cables with the protective conductor, the protective conductor must be the last one disconnected after pulling out
- maintenance of el. installation and equipment in safe condition and regular inspection and eliminate detected defects
- maintenance of open space and access to the main switch
- before relocation of consumer connected with mobile supply disconnect the el. appliance safely by pulling the plug from the socket (does not apply to appliances that are specially designed and adjusted for this purpose);

SOURCE OF RISK: **No. 2.6 Effects of adverse lighting**

DANGER AND EVALUATION OF SEVERITY:

- eye fatigue	A2	B1
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SAFETY MEASURES:

- maintain the optimal lighting level (from 200 to 500 lux)
- ensure suitable local lighting
- prevent glare

3. EVALUATION OF THE RISKS AND POSSIBLE THREAT TO SAFETY AND HEALTH OF MAINTENANCE OPERATORS

ASSESSED SYSTEM: Workshop and building facilities associated with the operation

OVERVIEW OF THE SOURCES OF RISKS:

- 3.1 Workshop workplace
- 3.2 Floors, communications
- 3.3 Material handling
- 3.4 Hand tools
- 3.5 Electric hand tools
- 3.6 Drilling machines
- 3.7 Grinding machines
- 3.8 Electric arc welding
- 3.9 Electrical equipment

SOURCE OF RISK: **No. 3.1 Workshop workplace**

DANGER AND EVALUATION OF SEVERITY:

- untidy workplace, tripping, falling materials, punctures and cutting
by sharp edge of the scrap of sheet metal not removed from the floor, etc. A2 B2

SAFETY MEASURES:

- maintaining order, free passages and service areas, removing sharp cuttings from the floor
- store material and spare parts clearly, ensure their stability

SOURCE OF RISK: **No. 3.2 Floors, routes**

DANGER AND EVALUATION OF SEVERITY:

- tipover, fall of person on flat surface A2 B2
- interception on miscellaneous obstacles A2 B2
- slipping when walking or working on wet or greasy floors A2 B2

SAFETY MEASURES:

- removal of any communication obstacles that can be tripped over
- wear suitable work shoes
- floors must be level and resistant to damage
- all aisles and routes must be open and passable at all times in the specified profiles

SOURCE OF RISK: **No. 3.3 Material handling**

DANGER AND EVALUATION OF SEVERITY:

- overload due to handling of overweight loads	A2	B2
- damage to the spine due to incorrect load lifting	A3	B4
- injury of joints by sudden uncoordinated movement	A3	B4
- crushing of hands and legs to the loading area	A4	B2
- loss of consistency and disintegration of load, fall on foot	A4	B2
- cutting of hands, pricking, abrasion	A3	B2
- handling of loads in confined space	A3	B2

SAFETY MEASURES:

- respecting of the forbiddance to dwell in the area of possible undesired movement of load
- observance of the minimum width of the aisles
- correct ways of manual handling
- lifting of loads in a position without bent back and without turning the trunk
- keep the load close to the body, avoid lifting with jerky movements
- ensuring a firm grip of loads
- check of condition of loads before manual handling
- use of appropriate handling aids
- avoidance of handling with damaged packaging
- use of PPE
- ensuring sufficient handling space
- during manual handling, the hands must be loaded evenly, holding of the load in the hands must be limited to a minimum time
- boxes or goods in packages must not be carried by gripping binding straps or wires

SOURCE OF RISK: **No. 3.4 Manual tools**

DANGER AND EVALUATION OF SEVERITY:

- slash wounds, cutting wounds, stabbing wounds, crushing, bruising, in case of unwanted contact tooling	A3	B1
- eye injuries from flying debris, small particles, fragments, burrs, etc.	A3	B4
- slipping of tools out of the hand	A2	B2
- hitting the employee with a released tool, with a hammer, head, etc. from handle	A2	B2
- hammer impact - bruising of the hand that holds the material when hit by the hammer, when the hammer slips out of the hand	A3	B2

SAFETY MEASURES:

- compliance with the ban on the use of damaged tools
- use of tools without cracks and burrs
- use of personal protection aids to protect eyesight
- firm attachment of the handle, securing against loosening with wedges, etc.
- design of the gripping part of the tool, smooth suitable shape of these parts, without cracks
- keeping handles and gripping parts of tools dry and clean, protection against oil and grease
- if possible, avoid working with a tool overhead
- movement of cutting tools away from the employee's body
- use of tools of suitable shape and size
- when working with slashing tools, guide (direct) the tool away from the employee's body
- prohibition of using a screwdriver as a chisel or a crow-bar
- compliance with the ban on the use of open and damaged keys

SOURCE OF RISK: No. 3.5 Electrical manual tools

DANGER AND EVALUATION OF SEVERITY:

- | | | |
|--|----|----|
| - crushing of hand, dislocation and fracture of a finger, cutting of hand
in case of jammed drill bit, while holding the workpiece in the hands | A3 | B2 |
| - slipping of tools out of the hand, drill bit cracking | A3 | B2 |
| - cutting with a rotating tool (drill bit, grinding wheel) | A2 | B2 |
| - injuries to the eyes and face by flying parts when working on various materials | A3 | B2 |
| - endangering the employee by falling parts when working with tools overhead | A2 | B2 |
| - electric shock | A2 | B4 |

SAFETY MEASURES:

- movable power supplies must be protected against damage
- adjustments, cleaning, lubrication and repairs may only be carried out after disconnection from the mains
- the tools may only be stored, carried or abandoned when at rest
- revisions of el. hand tools are performed regularly
- check of el. tools is always carried out before starting work with the tool
- when working with el. tools the operator does not use loose-fitting clothing
- in the event of danger to eyesight, wear safety goggles or face shields
- el. tools must not be used in damp and wet environment or environment with a risk of fire or explosion
- el. power supply cord must be protected against mechanical damage
- the worked material must be secured against unwanted movement
- el. tools must be disconnected from the power supply when not in use, before servicing, when changing accessories or tools
- the grinding wheel cover must not be removed or modified
- avoid relocating the tools connected in the mains with a finger on the switch
- avoid relocation of tooling holding it by supply cable

SOURCE OF RISK: No. 3.6 Drilling machines

DANGER AND EVALUATION OF SEVERITY:

- eye injuries, facial burns	A2	B3,4
- cutting by chips, cutting of hands on the edge of the tool (drill bits), on a chip wound, or stuck to the tool, on a clamping device or on clamped workpieces	A3	B2
- bruising of hands, or feet caused by the fall of a drilled object or vice	A2	B2
- capturing, winding of hand, unwanted contact of the hand with drill bit	A2	B3
- capture by a rotating drill bit, handle and wedge left in the spindle	A2	B3
- hair capture	A2	B3,4
- limb drawing in when shifting gears	A2	B3
- injuries to hands when drilling of a workpiece in the free hand and with an insufficiently fastened workpiece	A2,3	B3
- hitting by workpiece when the drill gets jammed	A2	B2

SAFETY MEASURES:

- maintaining order, free passages and service areas at the machines, removing sharp cuttings from the floor
- wearing glasses or a face shield
- use of brushes, scrapers, brooms, hooks to remove chips
- attaching vice to the bench with at least two screws
- avoid reaching into danger area during machine running
- avoid leaving the handle in the spindle
- compliance with the ban on the use of gloves when operating the drilling machine
- suitable equipment, without loose parts, without hand bandage, etc.
- avoiding forbidden manipulations
- use of hat, scarf if the operator has long hair
- covering of belt transmissions from el. motor towards the drilling spindle
- protection against spontaneous displacement of the spindle to the lower position
- use of a vice to fasten the workpiece
- ban on manual spindle braking
- prohibition to hold the workpiece by hand only
- have a common switch accessible from any place of operation

SOURCE OF RISK: No. 3.7 Grinding machines

DANGER AND EVALUATION OF SEVERITY:

- injuries to the eyes, face due to flying debris, small particles and dust generated during grinding	A3	B3,4
- capturing and rejecting of workpiece	A2	B3
- injuries to fingers when the operator's hand comes into contact with the rotating grinding wheel during grinding	A2	B3
- injury from being hit by a fragment of a disc when the disc breaks	A2,3	B3,4
- trapping of a loose end of work clothes, unfastened sleeves, hair, bandages, dressings on hands, etc.	A3	B3

SAFETY MEASURES:

- use of covers, glasses, face shield
- avoid using an excessively worn wheel
- timely adjustment of the gap between the support and the circumference of the grinding wheel (max. 3 mm)
- use of an undamaged tested wheel and its correct clamping
- the grinding wheel may only be clamped to the grinder spindle by an experienced, trained employee
- perform a test run after clamping the wheel
- avoid exceeding the maximum permissible circumferential speed and speed of the wheel
- avoid removing the grinding wheel covers, it is forbidden to grind from the side of the wheel
- correct work clothes

SOURCE OF RISK: No. 3.8 Electric arc welding

DANGER AND EVALUATION OF SEVERITY:

- | | | |
|---|----|----|
| - hot splashes of sparks, droplets of molten metal and slag | A1 | B2 |
| - fire or explosion | A5 | B3 |
| - injury | A5 | B3 |
| - risk of electric shock | A5 | B5 |
| - radiation | A5 | B3 |

SAFETY MEASURES:

- before starting welding, the place where welding will be performed must be inspected to see if there are flammable substances in the vicinity of the area where welding is to take place
- the occurrence of a fire or explosion at the site of welding and in adjacent areas (underneath, overhead, beside) must be avoided by removing flammable and explosive substances or by covering them with a non-combustible substance and by ventilating
- only persons over 18 years of age with a valid welding certification can perform welding
welding certificate
- use of PPE (welding helmet, shield, gloves)
- in case of increased danger, welding is performed only upon the written order and upon the execution of the safety measures ordered
- during the work, during its interruption and after the end of welding in areas with the risk of fire, the welding site and adjacent areas must be inspected
- earthing cable when welding with el. arc, connects with a clamp only to the workbench or directly to the welded object
- welding cables must be properly insulated

SOURCE OF RISK: No. 3.9 Electrical devices

DANGER AND EVALUATION OF SEVERITY:

- injuries due to electric shock	A3	B3
- incidental contact of persons with live parts	A3	B3

SAFETY MEASURES:

- immediately report any detected defects in the electrical devices and arrange for a professional repair
- prevent persons without electrotechnical qualifications from interfering with and repairing el. equipment
- observe the ban on leading el. supply cables on routes and there where they could be damaged
- maintenance of el. installation and equipment in safe condition and regular inspection and eliminate detected defects
- compliance with the ban on removing barriers and covers, opening access to electric parts
- exclusion of activities in which the employee would come into contact with live parts
- protection against dangerous contact or approach to live parts of el. equipment
- observe prohibitions on warning signs (respect safety messages)