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PREVENTION OF OCCUPATIONAL RISKS AT SUGAR PLANTS

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Abstract. The paper identifies the main occupational risks that are characteristic of sugar production, which include: physical, chemical, biological and psycho-physiological. Modern measures to prevent them are given.

Keywords: occupational risk, labor protection, sugar production, labor protection measure.

The work carried out in sugar factories is a professional activity that exposes many specific risks, physical and chemical.

To extract sugar from beets or reeds requires many dangerous and noisy machines for the cleaning process, grinding before cleaning. The high temperatures used in various sugar production processes expose sugar bowls to the risk of burns, and sugar dust or dusty residues to the risk of explosion and respiratory damage. Many workstations (lighting, sulfitation, bleaching, cleaning and disinfection, etc.) in sugar mills require the use of chemicals that can cause skin and respiratory disorders [1].

Occupational risk assessment, organization and layout of the work environment, collective prevention measures, wearing appropriate personal protective equipment and hygiene measures (clothing and beverages) and the principles of the HACCP system can reduce trouble and significantly reduce occupational risks in the sugar industry: organization and planning of work environments (machining aids, ergonomic workplaces and machines, non-slip flooring, etc.); collective prevention measures (ventilation, sound insulation, etc.); wearing appropriate personal protective equipment (masks, shoes, protective clothing and gloves); observance of collective and individual hygienic measures and medical education and training of sugar workers.

The raw material for sweets is reeds or sugar beets: sweets produce not only white sugar, brown sugar in lumps or powder, but also molasses, which is used as a fermentation medium for the production of alcohol (ethanol) for beverages, chemical use or biofuels, and bagasse residues, cellulose and degreasing used as fuel, feed and soil conditioner, respectively.

Sugar production can use several physical and chemical processes, but they have a similar principle, and production involves different sequential operations designed to extract sugar and then to process it, which can be carried out at the same plant or in different industrial facilities. (plant, refinery).

Some machine parts used in sugar factories, in particular during cleaning and maintenance, adjustment, start-up, are sources of serious accidents due to rotating parts (eg centrifuges), in particular during untimely start-up, abnormal stops after jamming or energy loss. Possibilities of access to various danger zones of vertical bucket or horizontal belt conveyors (cleaning under the conveyor, unlocking, unlocking, etc.) cause potential serious accidents through moving parts or conveyor belt.

This can lead to cuts on the hands, ruptures of the forearms or crushing during cleaning, for example, or when moving moving parts of the machine, grabbing, grabbing, rubbing, winding hair and clothes with rotating cylinders .

There are many sources of noise in sugar mills, especially during the process of cleaning and rubbing beets and chopping cane before processing, creating a noisy environment from all running machines. Sound pressure levels generated by machine noise (without proper sound insulation) can exceed 100 dB. In addition to damage to the auditory system (hearing loss, tinnitus, etc.), ambient

noise can cause discomfort or stress, which can lead to psychological disorders and pathologies that harm not only the health of the worker but also the safety of his work by reducing alertness and agility, or concentration.

Pollen-bearing microorganisms (molds, etc.), which are ubiquitous in sweets, can cause frequent allergic reactions. Many pneumoallergens have been found in the dust of moldy sugarcane residues, especially bacterial endotoxins and fungal toxins, the main role of which in the inflammation of the respiratory tree explains the appearance of chronic bronchitis, rhinitis with frequent superinfection causing sinusitis.

Inhalation of bagasse dust causes acute attacks of bagasse, shortness of breath, headache and fever, which can eventually develop into pulmonary fibrosis. Heavy dust is usually accidental (unlocking the machine, tearing sleeves, cleaning equipment, breaking and spilling bags, errors when emptying or filling silos, etc.), but there is also a gradual accumulation of very fine dust that covers the ground, silo walls, houses and staffed premises, cable trays, ducts, pipes, devices and equipment, especially in all volumes of dead, depressions and confined spaces that are difficult to clean.

All combustible dust, including sugar dust and pulverized waste (pulp and bags), can explode or burn. The concentration of dust must reach the minimum explosive threshold in a small and limited amount, and there must be contact with an energy source (spark, static electricity, hot surface, etc.).

Sugar poses a risk of burning in dehydrated or dusty form or due to self-heating caused by aerobic fermentation of molasses.

Moving mechanical parts of machines and conveyors can get dusty. Sources of ignition can be the interior of elevators, hot surfaces of engines, machine bearings, sparks created by friction of parts against each other, especially in the presence of foreign bodies (stones) or formed by faulty electrical equipment.

The formation of a cloud of dust can be caused by leakage from the device, as well as the suspension of air current dumps or layers of dust deposited on the ground (for example, emissions of sugar outside the tape carrier): the primary explosion is inflammation of this cloud led to contact with intense heat followed by a secondary explosion under the action of a pressure wave from the primary explosion.

Chemical aggression through contact with cleaning and disinfection of equipment and workplaces. All maintenance and cleaning operations involve the removal of inert surfaces (floors, walls, countertops, etc.) of any visible contamination and the inactivation or destruction of microorganisms. prescribe detergents, disinfectants, descaling agents that often use very aggressive chemicals that can cause inhalation or absorption poisoning and skin or eye burns or allergic sensitization. These irritating and / or allergic pathologies often affect the skin (eczema), and then damage to the mucous membranes of the eyes (conjunctivitis), nose (rhinitis) and bronchi (asthma, etc.).

Phosphoric acid, used to process sugar, is corrosive to the eyes, skin and respiratory tract.

Falls from the same level, cuts or abrasions, disorders of the musculoskeletal system associated with manual handling and handling, are numerous in the sugar industry.

Working conditions at the sugar factory are favorable for falling: floors that are often wet or slippery due to contamination due to the presence of various wastes on the ground, spillage of liquids, etc.

Sugar factory work also involves a lot of manipulation and repetitive gestures during packaging and cleaning work: the result is frequent occupational diseases related to peri-articular diseases and chronic diseases of the lumbar spine.

Direct skin contact with hot surfaces or liquids (high temperature of sweet juices) can, of course, initially cause very serious skin burns, for example when the compensatory joint ruptures, causing a burning sweet flow of juice.

The process of large industrial sugar mills is highly mechanized and modernized: collective prevention is then the result of the use of automated production systems and mechanical devices,

such as dust extraction, which reduce worker exposure and significantly reduce physical, chemical and explosive or fire. The sugar factory process, controlled by centralized computerized control, reduces interference in the workshop and thus significantly reduces the possibility of allergens or other sources of exposure. However, incidents involving the automation of work, leaks, and malfunctions pose a danger and also require intervention in maintenance, which remains dangerous.

Employees should also be informed about hazardous products that are used and trained in safe work.

The prevention of fires and explosions is both to reduce the spread and deposition of combustible dust and to avoid the heat sources responsible for ignition: in particular, it is necessary to limit sugar emissions,

The minimum concentration of explosiveness at the sugar factory should not be achieved, avoiding emissions and accumulation of dust, on the one hand, the presence of ventilation and suction systems.

Components such as fans and ducts should be accessible, easy to maintain and clean. In particular, networks are quickly clogged with failed filters, blocked condensate drains, and so on. Regular maintenance of the ventilation system (cleaning of exhaust ducts, replacement of filters) is an important condition for good work.

Smoking bans are fully respected. Introduce mechanical insulating barriers to prevent the spread of flames as part of secondary prevention.

All machines must have the warnings, signs and warning devices necessary to ensure the safety of workers in order to eliminate or minimize the risks of cutting, grabbing, crushing and cutting. This identification should be done using icons and standardized colors. Work elements must be arranged, protected, operated or equipped in such a way that operators cannot reach the danger zone (protective covers for moving parts, protective light curtains, etc.).

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ALGORITHM OF ACTIONS AT THE ACCIDENT SCENE

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Abstract: Traffic accidents today have become practically the most frequent man-made emergencies. It is almost impossible to avoid road accidents. Both a beginner and an experienced driver can find himself in an unexpected situation on the road. In any case, it's of vital importance to know the "basics" of actions in such a case: what should be done first of all, what papers to draw up at the scene, what papers each owner of damaged cars must sign.

Keywords; road accident, gathering information, describing the emergency, first aid, diagram of the scene.

Typically, when you are in an accident on the road, an accident report describing the accident must be completed. A traffic accident is an accident committed with the participation of at least one power-driven vehicle in motion, as a result of which harm is caused to a person's life or health, his