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THE BASIS OF FIRE PROTECTION

Abstract: The lecture brings short information about the rules regarding the Fire protection and OHS in rescue services in Slovakia.

Key words: fire protection, OHS, hazard level, accident

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1. HAZARD LEVELS IN FACTORIES

As the industry is continuously developing, the number of fatal accidents is constantly rising - including the accidents in nuclear power stations or hazardous emissions causing inversions. In 1909 (Glasgow, Scotland), 1063 people met their fate in the ironworks and engineering works and died as a result of atmospheric temperature inversion caused by emissions. A similar case occurred in the USA(Donora.) - 15 people lost their lives at a zinc plant. The accident had lasting consequences for up to 5,900 people. This figure represents 43 percent of the plant's workforce. The UK, Londonregarding low quality coal in resulted in repeated inversions and the subsequent death of 4000 inhabitants. 2000 people were made ill. 4 years later, in 1952, 46 people in Minamata (Japan) died as a consequence of organic mercury poisoning discharged into the sea. In 1957, the fire of a reactor contaminated the area of 300 km2 in Windscale (England) and caused the death of two people. Such cases are unfortunately quite common. One of the most tragic accidents is the leakage of toxic gas (methyl isocyanate) from the factory producing insecticides and causing 2000 casualties. The incident had lasting consequences for 150,000 people (and affected even the generations after). The most published accident - the explosion of the Ukrainian power station in Chernobyl and the subsequent fire of the moderated reactor C - caused enormous damage. In addition to thousands of casualties, the descendants of the survivors still happen to have Siamese twins or the new-born babies suffer from other abnormalities. The occurrence of cancer has increased among all the affected. This disaster happened in 1986. Many environmental disasters, mostly the ones having far-reaching consequences, happened as a result of direct and deliberate action of people. In addition to millions of deaths and the descendants suffering from various illnesses, such accidents destroy the whole ecosystem and the ecological balance is never restored. People use their technical knowledge to destroy and control the world. Atomic weapons, which should never have been made and used, are becoming the most powerful weapons in the wars. The biggest catastrophes in the history of humanity happened undoubtedly during World War II - the atomic attack on Hiroshima and Nagasaki, or the "safe" nuclear testing at Bikini atoll damaging the surrounding

ecosystem (no casualties were reported but the damages are nevertheless severe). The more advanced our technology is, the more states can "boast" nuclear weapons. The whole society is rightfully concerned about a nuclear war which might break out at any time. What implications would a nuclear conflict have? The environmental consequences of a nuclear conflict could be as follows: In 1983, there was a conference (in Washington, USA) that was supposed to evaluate the results of a nuclear war. The conference was attended by more than a hundred of eminent scientists. They found out that the effects of a nuclear bombing can be compared to the volcanic eruption of the Indonesian volcano Tambora (1816), when the country experienced the "Year without a Summer" (i.e. the temperature across the globe dropped by one degree due to this eruption).

They came to conclusion that a week following a nuclear conflict a dust twilight, lasting several months, would spread over the Northern Hemisphere. Along with fires, dust and other emissions, all solar radiation would be reflected and we could experience a so-called nuclear winter with the temperatures ranging between 15 and 20 degrees below zero. Surface water would, of course, freeze and no water would be left for the animals to drink, resulting in their death. Lack of solar radiation would impair the process of photosynthesis for all plants and this would significantly harm and even destroy the whole biosphere. Nuclear cloud would spread out over the Southern Hemisphere and the whole air circulation would be totally disrupted. At this stage, different types of plagues would break out. Since the human body is weakened, the vast majority of the population will be astoundingly susceptible to cancer. Food, coming from any source, would become inedible and it is probable that the biocenosis (including people) would not able to adapt - forest fires and dust storms, that we would no longer be able to extinguish, would occur. Nitrogen oxides from the explosions in the stratosphere would disturb about 30 percent of the ozonosphere. Strong and devastating ultraviolet light would dawn - it is estimated that it would be 2 to 4 times greater than it is today. The survivors would go blind. One billion people would die right away during the nuclear conflict, additional one billion would die of indirect consequences. In the Northern Hemisphere, no human being is to be able to survive and in the Southern Hemisphere there is only a small minority of survivors who

would live in a very distorted biosphere. What is more we have to take into account that the conference took place 19 years ago so we can assume that the consequences might be even more frightening.

Figure 1- Chernobyl statue

1.1 Greatest Industrial Accidents in Slovakia

It took 14 years to build the plant.The type of the reactor corresponds to the one in Chernobyl. The nuclear reactor was put into operation on 24 October 1972. The incident occurred on 5 January 1976 when the fuel elements were being changed. The accident resulted in two casualties. Radiation leakage was high but the situation was under control.

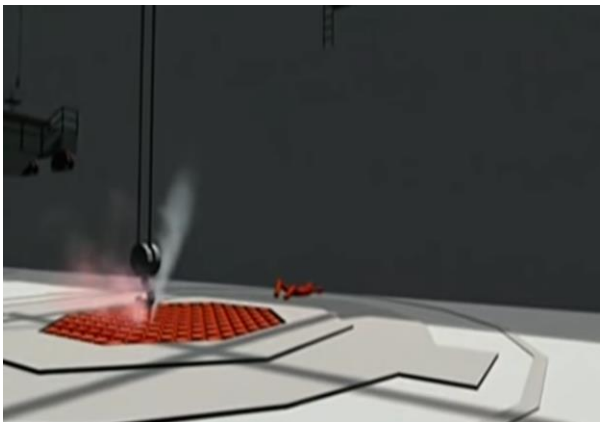

Figure 2 - Nuclear Power Plant in Jaslovské Bohunice

Fire of a Lumber Yard with Finished Products

On Tuesday (7 August) evening, a fire broke out in the industrial area in the center of Banská Bystrica. The fire engulfed the storage shed and some wooden pallets stored in the vicinity of the shed caught fire as well. "One floor as well as the roof were affected by the fire.. The fire broke out in a lumber yard storing wood-fiber boards. Fire spread quickly along the roof and the whole yard. As a result of the thermal load, the roof caved in and the radiant heat was endangering the neighboring buildings. From the very beginning, the operations focused in particular on extinguishing the fire inside the yard, on cooling the adjacent buildings and consequently on putting out the roof fire of the neighboring building. The clean-up ended late at night. The extent of the damage is not known as yet. 24 fire-fighters along with 8 voluntary firemen intervened at the scene. 12 pieces of equipment were used.

Figure 3 Fire of a Lumber Yard with Finished Products

2.0 ACT NO. 314/2001 COLL. ON PROTECTION AGAINST FIRES

- to ensure routine fire inspections in buildings and other compounds and to remove these deficiencies;

- to implement fire protection measures concerning: the places where the risk of fire is higher; the activities associated with an increased risk of fire or the time intervals when the risk of fire is higher; the events with greater number of participants;

- to determine the places where the risk of fire is higher and to issue the respective regulations, interdictions and instructions;

- to implement measures protecting the facility against a fire outside working hours,

- to provide fire safety trainings and to test the staff and the people authorized by a legal person or a natural person-entrepreneur to sojourn on the premises;
- to ensure that the fire safety requirements are observed - starting from the project documentation up to the construction itself and the changes in building use;
- when changing the building use, it is necessary to make sure that the fire safety of the building or its parts is not impaired, that the safety of persons is

not reduced and that the potential intervention of the fire-fighters will be made possible at all times,

- to clean and inspect chimneys regularly; the inspection needs to be carried out by a qualified professional before connecting a fuel appliance to the chimney, before switching from the fuel appliance to the central heating system or individual central heating, before changing the fuel type and after construction changes on the chimney
- to observe the technical conditions and requirements of the fire protection when connecting and using fuel appliances, electrothermal appliances and central heating system and in the construction and use of chimneys, flues; to ensure that the chimney is labeled;
- to observe fire protection regulations when handling and storing any flammable substances and fire-supporting substances, any technical equipment containing flammable substances or fire-supporting substances

3.0 DECREE OF THE MINISTRY OF THE INTERIOR NO. 121/2002 COLL. ON FIRE PREVENTION

- to procure and install appropriate types of fire fighting equipment, fire-extinguishers and other means of fire protection in the buildings and inside the premises, to maintain them in operational condition, to ensure it is examined and maintained by a qualified professional if enacted by the law, and to maintain and keep the maintenance documentation
- escape routes, emergency exits, emergency response routes, boarding platforms, distribution boxes for electric power, gas, water and the fire fighting equipment - all of them have to be marked and kept clear

- to allow alarm systems serving as a protection against fire for an adequate compensation
- to keep the access to water sources used for fire fighting purpose clear
- to allow alarm systems serving as a protection against fire for an adequate compensation
- to carry out a mock fire warning in the premises owned by a legal person and a natural person-entrepreneur in which the evacuation of the occupants might be more difficult
- to set up the necessary number of fire call centers
- on the basis of the decision issued by regional directorate of the Fire and Rescue Corps (hereinafter referred to as the "regional directorate"), the owner is supposed to make a fire risk analysis for the buildings and premises and to establish a private fire-fighting brigade if he is imposed to do so by a regional directorate
- to establish qualified fire patrols and to make sure they carry out their duties as necessary
- to notify, without undue delay, the relevant district directorate of HaZZ (hereinafter referred to as "district directorate") of every fire occurring in the buildings, premises or on possessions which they own, administer or use
- to provide the necessary documents, cooperation and assistance in order to ascertain the cause of fire

3.1 FIRE-FIGHTING PARTIES AND THEIR SERVICES

Machinery Service:

in operational condition,

its maintenance, repairs and inspection,

documentation and records concerning the operation, maintenance, repairs and inspections

- ***to secure liquid fuels, grease and other operational materials, extinguishing substances, spare parts and other materials,***
- ***to provide trainings,***
- ***to carry out test-drives and to retrain drivers***
- ***to submit proposals for changing and completing the registration documents and driving licenses***

Anti-gas service

chemical and technical tasks relating to the protection during intervention if the air is unbreathable and the environment is detrimental to human health and in the handling of chemicals, radioactive, biological and dangerous substances

- chemical analysis,
- to suggest the method and the extent of the protection,
- to determine working procedures,
- decontamination and disinfection,
- to plan, maintain, repair and inspect,
- to keep the documentation and records regarding the use, the operation, the maintenance, the repairs, and the inspections.

Flood Emergency Service

- to carry out rescue operations during floods, accidents and other incidents concerning water,
- to plan and conduct maintenance, repairs and inspections,

- to prepare flood plans of the rescue operations,
- to submit the proposals concerning the modernization and replenishment of the equipment,
- to provide trainings

Fire Brigade

- carries out rescue operations and provides assistance where the environment, the life or the health of the people are in danger (using the necessary equipment and having the right qualifications).

3.2 TACTICAL Trainings and Their Content

- objectives of the training
- focus of the training
- operational and tactical characteristics of the building
- most difficult alternative of the fire
- situation description and clean-up
- reckoning of the manpower and equipment
- evacuation
- rescue teams and resources deployed
- timetable - arrival of the rescue teams
- intervention schedule
- establishing radio contact
- duty roster and operations scheme
- recommendations for the incident commander

- methodology of the training
- Appointing judges

4.0 ACT NO. 124/2006 COLL. ON OCCUPATIONAL HEALTH AND SAFETY

Personal Protective Equipment - firefighter

- Working garment
- Fire-fighting helmet
- Fire-fighting garment
- Fire-fighting shoes
- Fire-fighting gloves
- Fire-fighting Nomex pupa
- Fire-fighting belt
- T-shirt (long sleeve)
- T-shirt (short sleeve)
- Cap
- Working helmet
- Working gloves
- Working shoes
- Protective glasses

REFERENCE

[1] ACT NO. 314/2001 COLL. ON PROTECTION AGAINST FIRES

[2] Act No. 124/2006 Coll. on Occupational Health and Safety

[3] Decree of the Ministry of the Interior no. 121/2002 Coll. on Fire Prevention